

Executive Summary

The proposed CROMERRR rule would allow all reports submitted to EPA to be submitted with equal validity in electronic form or paper form. EPA would also allow all reports to be stored in electronic form. Electronic reporting would be allowed but not required.

Electronic data submissions would be done by uploading to a central web site called the Central Data Exchange (CDX). The CDX would continue to accept Electronic File Transfer Protocol (FTP) and Electronic Data Interchange (EDI, sent directly via a modem network) reports as well. Electronic signatures would accompany all submitted reports where signatures are required; a PIN-based registration system would identify reports where signatures are not required.

The CDX would record and store submitted reports and would forward them to the appropriate EPA office. The CDX does not specify the format of any submitted documents; that is left to the discretion of the EPA office which receives the report.

From the perspective of water utilities, the implications of the CROMERRR rule are:

- ? Most water utilities report to state agencies, not directly to EPA. Hence EPA's specifications for state-based alternatives to CDX are more relevant than the CDX itself, and should be specified in detail.
- ? Rather than providing a model for "CDX/State" as was done for SDWIS/State, EPA could encourage (or fund) state software development as has been successfully accomplished in many states for hazardous waste, discharge monitoring, and air reporting.
- ? Electronic data submission is voluntary at the federal level, but could possibly be mandated at the state level (as in California as of September 2001). Hence the CDX system should be designed as if it would be mandated in the future.
- ? CDX focuses initially on large reports from large facilities. However, the more numerous small facilities provide a greater potential for cost savings and quality improvements in the long-term, and hence should be an equal focus for CDX design and development.
- ? The proposed rule emphasizes digital signatures, which increases accountability but is burdensome (obtaining a digital signature requires three mailings, and the legal rules require a dozen pages). Mixing the goal of increasing accountability risks failing at the primary goal of encouraging electronic reporting.
- ? Because the rules for digital signature are long and complicated, EPA should create a separate rule and a separate CDX web page for submitting reports where a digital signature is not required.
- ? Legal accountability for digital signatures are not an issue in civil litigation because the original database would replace submitted reports as evidence, but would be relevant in criminal fraud cases.
- ? EDI (direct modem transmission) will continue to be PIN-based. EPA should consider applying the same rules to all CDX submissions, i.e., identification without a digital signature. A PIN-based system increases accountability in many circumstances.
- ? Reporting facilities would benefit from proof of timely submission which CDX would provide – but CDX must provide sufficient evidence in reply documents and must handle situations where the CDX web site crashes.
- ? Labor and cost savings for electronic data submission is small at facilities like water utilities which primarily have one-page reports. At state water agencies, the labor and cost savings are mostly transfers from clerical costs to computer costs. However, data quality increases substantially, in terms of accuracy and timely analysis.
- ? Paper records are maintained by water utilities under state and local regulations, and hence water utilities cannot take advantage of electronic data storage to replace paper records.
- ? CROMERRR should define the format of submitted reports, or allow the recipient EPA offices to define the required formats, because formatting the data is the single largest cost of preparing electronic data submissions. An estimate of the cost for a water utility to convert its LIMS system to electronic reporting would be a minimum of \$2,200.

Introduction

EPA is proposing to allow electronic submission and record-keeping of all federally-mandated reports. This memorandum provides comments on the proposed rule from the perspective of water utilities, which are required to submit water quality reports on both water supply and wastewater. This memorandum is submitted by AWWA and is written by AWWA and TPMC.

The American Water Works Association (AWWA) is a nonprofit society dedicated to the improvement of drinking water quality and supply. Founded in 1881, AWWA is the largest organization of water supply professionals in the world, representing more than 4,000 utilities that supply water to roughly 180 million people in North America.

Technology Management and Planning Corporation (TPMC) has extensive experience in technological applications for EPA, including projects at the federal, state, and municipality level. TPMC works regularly with water utilities in providing technological solutions for environmental regulatory compliance.

In preparation for this memorandum, we interviewed water utility managers (those responsible for sending reports) and state managers (those responsible for receiving water utility reports as well as those responsible for sending data to EPA). Those interviewed represented five states: Arizona, California, Massachusetts, Nevada, and Pennsylvania. Contact lists and interview notes are available upon request. In addition, several printed documents and Internet publications are included in the discussion – bibliographical information appears at the first citation of each.

In this document we address the implications of the proposed rule for water utilities. We respond explicitly to each solicitation for comments that appears in the Federal Register proposed rule, except for instances where specific legal and/or technical implications are beyond our expertise. We further respond in general to omitted issues which we consider relevant to water utilities, and expand upon topics where the solicited comments warrant further analysis of the implications for small reporting facilities. We include an Executive Summary which summarizes our key points and recommendations.

Summary of the proposed rule

The proposed Cross-Media Electronic Reporting and Record-keeping Rule (CROMERRR), as described in the Federal Register of Aug. 31, 2001, entails the following:

- ? Agencies or governments which report to EPA may do so electronically instead of on paper. The rule is voluntary – it *allows* reports to be filed electronically but does not *require* it.
- ? Electronic reporting will be accomplished via a web-based Central Data Exchange (CDX).
- ? Reports which require signatures must be submitted with electronic signatures; rules for electronic signatures ensure that they have equal legal weight as ink-and-paper signatures.
- ? Reports which do not require signatures are submitted via the CDX with a PIN number (Personal Identification Number) which has been obtained by registering with EPA.
- ? Record-keeping (as opposed to report submission) may also be done electronically instead of on paper, applying the existing rules for duration of records.
- ? Agencies or governments which currently use Electronic Data Interchange (EDI, a fixed-format text file transmitted directly via VAN networks to EPA) may continue to do so.

The proposed rule will not require any new actions by any regulated entity. Rather, it would allow regulated entities to submit the same reports electronically as are currently submitted on

paper, and establishes that electronic documents and electronic signatures have the same legal force as their ink-and-paper equivalents. The purpose of the proposed rule is to allow more accurate and faster data submissions (avoiding the need for re-keying the data from paper reports at EPA), and to reduce paperwork and the burden of submitting reports in printed format. These comments will focus on the implications for electronic reporting and record-keeping by water utilities. The section numbers, section titles, and page numbers refer to the Federal Register of Aug. 31, 2001. The relevant text from each section is included or paraphrased for reference.

I. B. What will the proposed regulations do... states, p. 46164

For regulated entities that choose to submit electronic documents directly to EPA, today's proposal will require that these documents be submitted to a centralized Agency-wide electronic document receiving system, called the 'Central Data Exchange' (CDX), or to alternative systems designated by the Administrator.

The primary issue for electronic reporting by water utilities is that almost all water utilities report to their state governments rather than directly to EPA (only Wyoming, the District of Columbia, and some Indian tribes have not claimed "primacy" in drinking water reporting). Hence the "alternative systems" of state governments which EPA might designate are relevant to water utilities, while the rules for reporting directly to EPA are mostly irrelevant.

This situation is not unique to water utilities – the majority of states have also claimed primacy in the areas of air emissions, hazardous waste, and discharge monitoring. The typical reporting method is that utilities provide reports to a state agency, which then consolidates and/or aggregates the reports from utilities across the state, and provides a summarized report to EPA.

From the perspective of water utilities and other entities which report to their state governments, the proposed rule should include details of how the state governments would report to EPA, and how submissions to state systems might differ from submissions to the EPA's CDX. How would a state CDX be functionally different from the EPA's CDX? Would EPA make software available for states? How would electronic signatures be handled when passing data from the states to EPA?

The goal of the proposed rule is to minimize the burden on small facilities (which have few reports and limited gains from electronic reporting) while maximizing the cost-savings for large facilities (which want an electronic reporting option implemented as soon as possible). The proposed rule is intended to be a voluntary option for any entity which submits reports to EPA. But water utilities will not have the option of electronic submission unless their state allows it.

EPA can foster the goal of maximizing paperless transactions by encouraging states to adopt electronic submission methods (i.e., when the state is acting as a regulator of utilities and a receiver of data, rather than as a respondent to EPA and a submitter of data). The proposed rule estimates that 5 states per year will implement electronic document receiving systems, at a development cost of \$1 million per system (Exhibit 4, ICR 2002.02). The same software at EPA is estimated to cost \$31 million – presumably that discrepancy is because the states can use the EPA software as a model. The proposed rule should detail how EPA might assist in the development of state systems, and specifically, what components of CDX are applicable at the state level.

In summary, the proposed rule falls short for drinking water utilities because it does not address the current realities in data flow. These realities are that water utilities do not report to the EPA but rather to the states and other primacy agencies. In many cases the data reported need to be aggregated before they are passed along to the EPA. Unless this proposal includes changing the party to whom utilities report, it is not likely to have much of an effect on drinking water utilities. The proposed rule is of little consequence to drinking water utilities unless it is embraced by the primacy agencies. On the other hand this could have a major effect on states and other primacy agencies; this is discussed in more detail below.

I. B. What will the proposed regulations do... CDX, p. 46164

Beyond [defining CDX specifications for states' alternative systems], today's proposal does not address State government electronic recordkeeping or data transfers. Today's proposal does not address any data transfers between EPA and States as a part of administrative arrangements to share data. EPA is exploring opportunities to leverage CDX resources for use by States, tribes and local environmental agencies.

Perhaps the intent is that the CDX software would have a "CDX/Federal" version for direct submission to EPA, and a "CDX/State" version for adaptation by states, like the SDWIS/Federal and SDWIS/State software model. The primary problem with that model has been that the states have drinking water requirements that differ from EPA's requirements, and similar problems with states' specific needs would require equally extensive modifications to any federally-provided software. An alternative would be that EPA could specify standards for CDX and then give the states resources to implement or modify existing systems and incentives to merge resources and develop common CDX systems modeled after EPA's system.

There has been substantial progress at the state level for development of software packages for electronic reporting, which in many cases have been adapted in other states. The SEES report (A State Guide for Electronic Reporting of Environmental Data, published Nov. 19, 1999 by the National Governors Association and EPA) details several such cases, for example:

- ? Florida's BRSdisk (biennial hazardous waste reports) is in use in eight states and is freely available to other states;
- ? Kansas' DEEMERS (discharge monitoring reports) has been adapted in one other state and is under consideration in three more; it is freely available to other states and follows the federal NPDES requirements;
- ? Arizona's AEIMS (air emissions reports) is readily adaptable and freely available to other states and uses the standard federal AIRS data format.

In terms of software for individual utilities, the norm is that the states provide software to interface to their electronic submission services free of charge (that is the case in all three states above, as well as for California's electronic submission system for water utilities, for example).

Another possible model is to use the CDX system itself as a means for water utilities to electronically submit reports to states, for state governments which have no capacity to operate a state equivalent of CDX. A key role of the CDX is to act as a central clearinghouse for receiving data and then routing it to its appropriate destination. While the destinations are intended to be offices within EPA, what if the reports were routed to state government agencies as their destination? In other words, water facilities would electronically submit data via the EPA's CDX to their state agency; the state agency would receive reports from CDX in e-mail form or some other form the state could accept. The advantage of such a setup is that the main CDX could receive, authenticate, archive, and perhaps transform the format of the data, before distributing it securely to the relevant state agency. The state agency would then only have to handle receiving reports by e-mail, and hence have less burden than maintaining a state equivalent of CDX. The purpose would be to ease the transition to electronic submission by splitting the burden between federal and state entities.

I. B. What will the proposed regulations do... voluntary, p. 46164

While today's proposal will remove regulatory obstacles to electronic reporting and record-keeping, EPA will make electronic submission available as an option for specific reports or other documents only as the systems become available to receive them.

It is understood that electronic data submission is inevitable and hence is likely to be further encouraged or to be mandated for larger utilities sometime in the future. While a voluntary system is the appropriate first step, the proposed rule should consider that a mandated system may

eventually follow, and be designed accordingly. Primarily, that means making electronic submissions minimally burdensome on small facilities, since those would be the ones which would not implement electronic submission until it becomes mandated. The remainder of these comments use that as the basis for discussion.

As an example, the state of California switched from a voluntary system to a system mandating electronic submissions in September 2001. While the system was voluntary, 95% of the data reported (measured by volume) was submitted electronically. The 5% of the data which was submitted on paper represented far more than 5% of the number of reporting facilities. This suggests that electronic submission of data may not be a viable or easy solution for the smaller utilities. Therefore, when California switched to mandatory electronic submission they have forced small utilities that may not have the proper resources to incur disproportionate costs relative to larger utilities in order to comply. EPA should presume the same pattern nationally, and accordingly set up the system for small facilities even though larger facilities are the immediate target.

Even if EPA never mandates electronic submission, the same logic applies, since states will probably introduce optional or mandated electronic submission before too long. Hence from the drinking water community's perspective, it is irrelevant that the EPA rules are voluntary, if state rules are mandatory. The conclusion is that setting up the system for small facilities is important even if they are not expected to participate initially.

II. A. EPA's Current Electronic Reporting Policy... EDI. p. 46165

[For EDI submissions], where the report in question requires a responsible individual at a facility to certify to the truthfulness of the submitted data, [EPA requires] the use of a Personal Identification Number (PIN) as a form of electronic signature.... We may continue to allow PIN-based approaches.

EDI submissions (Electronic Data Interchange) consist of a formatted file transmitted directly via modem to an EPA receiving modem, via a "VAN" network (i.e., a private network which does not involve the Internet). Security and accountability is provided by requiring a PIN for establishing the connection, and by having an ink-and-paper signed TCA (Terms and Conditions Agreement) before the first transmission. The standards for EDI are established in the "Interim Policy on EDI" of Sept. 4, 1996.

The current EDI standard is a substantially lower standard than the proposal requires – it is PIN-based rather than electronic signature-based, as defined for CDX. If EPA chooses to not raise the standard for EDI submissions, the result would be that reports submitted by web-based upload would adhere to higher standards while the same data submitted by EDI would adhere to the lower standards, creating a legal "loophole" (e.g., fraudulent reports sent via EDI cannot be traced to an individual, while fraudulent reports via CDX could be traced to the person whose electronic signature was used). If EPA chooses to raise the standards for EDI submissions, the costs for the increased standards should be additionally accounted for in the cost-benefit analysis for the proposed rule.

It is unstated in the proposed rule whether there have been significant issues with legal accountability, which is the stated reason for raising the standard. If there have not been ongoing issues of repudiation of submitted data in a court context, stricter standards address a hypothetical need while imposing real costs. If there have been issues of repudiation of submitted data, then EDI submissions should be halted, and again the costs for the increased standards should be accounted for.

From the perspective of water utilities, it is unlikely that any will submit data via EDI, since that program is intended for large facilities which report directly to EPA. If water utilities and other small facilities do use CDX electronic submissions, there would result an anomalous situation where relatively large facilities (those reporting by EDI) adhere to a less burdensome

standard (PIN-based) while relatively small facilities (those reporting by CDX) adhere to a more burdensome standard (electronic signature-based).

The resolution of this anomaly could include raising the EDI standard to include electronic signatures. The alternative is to base the new CDX standard on the same standard as EDI – i.e., use a PIN-based standard instead of requiring electronic signatures. If that system has worked acceptably for EDI for several years, it would seem logical to extend it *as is* to the new CDX system, rather than defining a more burdensome standard which has not yet been time-tested.

II. B. Changes from Current Electronic Reporting Policy. p. 46165

While we may continue to allow PIN-based approaches, our plan is to emphasize digital signatures.

Current reporting involves submitting signed paper reports and keeping copies of the same reports both on paper and as electronic data, for typical water utilities. A PIN-based electronic submission would require creating electronic versions of the paper reports, which are not typically created now. A digital signature-based submission would require the additional step of registering an identified person with EPA and maintaining the digital signature, which is also not done now.

Requiring only a PIN for web-based submission fulfills the goal of paperwork reduction at a minimal burden, while providing for chain-of-custody and non-repudiation in a way that has been in use for five years. Digital signatures do not address the goal of “reducing the cost and burden of data transfer and maintenance.” Hence a PIN-based system should be encouraged wherever an electronic signature is not required.

From a water utility perspective, no current reports require the legal non-repudiation which EPA is proposing for electronic signatures. While numerous water quality reports do have signature lines, the process of signing each report typically includes three staff people: a technician who looks over the values of the report; a quality control person who reviews that and ensures the data is presented correctly; and a lab manager who is legally responsible for submitting the report. Presumably the electronic signature is intended to apply only to the lab manager for purposes of legal chain-of-custody and non-repudiation. But in speaking to lab managers who perform this function, their view is that they are legally responsible for the report whether it physically bears their signature or not.

States are lax in enforcing that submitted reports have signature lines filled in, and typically accept reports regardless of whether the signature line is signed by a secretary in the manager’s name, or if the signature line is blank. Part of that laxity is presumably due to the understanding that the lab manager is legally responsible for the report, regardless of physical signature or electronic signature.

Even in states where electronic submissions are currently allowed (e.g., California), including just a PIN-based security system would be an increase in accountability. California’s current system allows for e-mail submission of reports, and does not confirm the identity of the e-mail sender once the method of submission is established. In summary, a PIN-based system would achieve the goals of increased accountability with minimal burden, while a digital signature-based system is more complicated and more burdensome without substantial additional benefit.

II. E. What Information Is EPA Seeking? p. 46166

In proposing to allow regulated entities to submit electronic documents and maintain electronic records, EPA has, at least, the following three goals:

- ? [1] To reduce the cost and burden of data transfer and maintenance for all parties to the data exchanges;
- ? [2] To improve the data—and the various business processes associated with its use—in ways that may not be reflected directly in cost-reductions, e.g. through improvements in data quality, and the speed and convenience with which data may be transferred and used; and

? [3] To maintain or improve the level of corporate and individual responsibility and accountability for electronic reports and records that currently exists in the paper environment.

Concerning the first— addressing cost and burden—EPA is particularly interested in and seeks comment on whether today's proposal will make electronic reporting and record-keeping a practical and attractive option for smaller regulated entities, especially small businesses. Concerning the second—addressing the data and the associated business process—we are especially interested in comments on how our proposed approach to electronic reporting and record-keeping will affect third parties, for example State and local agencies that may collect and/or use the data in implementing EPA programs as well as members of the public who have an interest in the data as concerned citizens.

On goal [1], cost & burden reduction:

The most relevant general conclusion for water utilities is that the cost and burden of data transfer will not be substantially reduced by electronic submissions. For the water utilities themselves, there would be a small savings in printing, binding, and mailing costs. In terms of burden reduction, water utilities most appreciate that they could electronically submit a report on the same day it is due, rather than count days in the mail before the due date for paper reports.

The larger potential cost and burden savings is at the state level, where the water utility reports are received, and are typically re-keyed into state-based systems. While it is true that electronic submissions will save substantial time in re-keying, that cost will in large part be replaced by a new cost of computer software maintenance.

For example, in Arizona, there are 7 staff persons involved in keying in data for the Department of Environmental Quality. The data manager estimates that 2 of those personnel could be switched to other tasks if electronic data submissions were implemented, but that a new I.S. staff person would replace them. The cost of one additional technical staff person is approximately the same as two keypunch staff persons, so there is no net cost savings.

It is unlikely to require a full-time I.S. staff person just for that role. But a new I.S. staff-person would be hired because once the data is immediately available electronically, there would likely be an increase in the number of requests for analysis reports. In other words, while the cost would remain the same, the quantity and quality of data analysis would improve.

On goal [2], improved data:

Besides an improvement in data analysis and speed of data availability, the quality of the data itself would substantially improve, in the opinions of state water managers. The re-keying process has inherent errors, from people typing in series of numbers with little context, and the error rate is understandably high. Some errors can be caught because values are out of range, but inevitably some are valid figures, just incorrect (for example, if an accurate pH value is 8.6, keying in 86 would be caught by range-checking, but keying in 6.8 would be valid but incorrect) . Those errors would be removed by electronic data submission, and hence the overall quality of the data would be improved. That should be considered the primary benefit of electronic submission – that more accurate data is available sooner.

On goal [3], improved responsibility:

Regarding improvements in the level of responsibility, from a water utility, this is high cost and low benefit. While maintaining the current level of responsibility is reasonable, using a new system as a means of improving the level of responsibility makes the system harder to implement and less likely to be used. A facility will be less likely to implement the new system at all if they know that they must undertake a new and more rigorous system of signature verification. Adding this goal diminishes the other goals – less expensive and higher quality data available sooner – which should be the focus.

It is reasonable to ask facilities to maintain the level of responsibility that is currently required of them, and it is reasonable to ask that they fulfill the current requirements which are currently lax in enforcement. But it is not reasonable to ask facilities to increase the level of responsibility and that goal should be removed from the proposed rule.

There are substantial gains from electronic submissions even from the perspective of small utilities. Primarily, small utilities would have a record that they submitted required reports in a timely manner. The proposed rule focuses on non-repudiation of data submitted, but non-repudiation works in the other direction also – the state agency cannot dispute an electronic submission was made on time, once the water utility has an electronic confirmation of its receipt. Secondly, improved accountability can mean improved public confidence, since timely information on local water quality would be more readily available. And improved speed means potentially improved public health, since water utilities would have quicker analysis of any problems in water quality.

II. E. What Information Is EPA Seeking? p. 46166

It is essential that we continue to ensure sufficient personal and corporate responsibility and accountability in the submission of electronic reports and the maintenance of electronic records; otherwise we place at risk the continuing viability of self-monitoring and self-reporting that provides the framework for compliance under most of our environmental programs. Therefore, EPA is especially interested in any concerns or issues that commenters may wish to raise about the effect that moving from paper to the electronic medium may have on this compliance structure—as well as assessments of the approaches EPA is proposing to address these concerns.

Water facilities keep paper records anyway for purposes of state compliance rather than EPA compliance. While some water facilities are enthusiastic about the prospect of electronic submissions, they do not envision a paperless office – they will continue to have paper files as backup and for other legal purposes. The EPA’s estimate (ICR 2002.02, exhibit 1) is that electronic record-keeping will occur in under 3% of the affected utilities. In short, corporate responsibility will be maintained because the paper records on which accountability is based will be maintained.

One water facility manager brought up the issue of data confidentiality. Electronic reports are easy to replicate and easy to distribute, and hence the data would be more readily available to the public. While the reports in question are not “business confidential,” and are all publicly available under the Freedom of Information Act, water facilities are often sensitive to the public being given access to raw data about, say, coliform counts. The norm is to provide data only in processed and summarized form, unless a specific FOIA request is made for raw data, and then with explanatory information about its proper interpretation. Electronic reporting will make raw data more readily available and water facilities would therefore expect to see more negative reaction to otherwise difficult-to-access figures.

Unless a clear data distribution policy is developed with an understanding of what data will be made available and when, a utility has little incentive to participate in this program from the perspective of data distribution and communications with the utility’s customers. Will EPA make electronic reports available on the Internet? Will FOIA requests be met with raw data or summarized data? Will raw data be accompanied by interpretation? A clear data distribution policy would help allay some utility concerns.

III. C. Which Documents Could Be Filed. p. 46167

EPA plans to give priority to receipt of the relatively high volume environmental compliance reports that do not involve the submission of confidential business information (CBI). While EPA does plan to enhance CDX to accommodate CBI, we will first want to gain experience implementing CDX in the non-CBI arena. EPA seeks comments and advice on priorities for electronic reporting implementation. EPA also seeks comments on this proposal’s global approach, and whether specific exclusions should be added to the rule.

From a water facility perspective, the priorities should be first on the interface between CDX and the states, and second on the format of the submitted electronic reports. These issues are discussed in detail in section I.B above and section III.E below, respectively.

Water facilities have no confidential business information, and hence CBI is a distant priority. That is true for all public utilities – drinking water as well as wastewater, power generation, and infinitum. Hence CBI should not be a consideration in the early stages – there is substantial ground to cover before business confidentiality becomes relevant.

III. E. How Would Today's Proposal Implement... CDX. p. 46168

...the proposed rule text does not include any detail about CDX per se or about what will be required of regulated entities who wish to use it. Nonetheless, in publishing today's proposal, one of EPA's goals is to share our plans for the CDX and to invite comments on the technical approaches that it represents.

The details of the implementation of CDX are critical in determining the cost of its usage. In particular, water utilities could readily use CDX if it accepted formats which could be made via convenient output from LIMS systems. Existing LIMS users report programming times of one to three weeks to prepare LIMS output into formatted flat files, for example.

The proposed rule states that “we propose to support data transfers through the Internet, via email, or via on-line interactions with Web sites, in a variety of common application-based formats, such as those output by spreadsheet packages.” (p. 46165). That implies, for example, that direct output from an Excel spreadsheet could be uploaded to CDX – i.e., that the CDX could then read the contents of an XLS document and interpret the data values. If that is the case, each EPA recipient office need only specify the expected column headings, and that would be very convenient and usable indeed.

On the need for defining document formats:

A more likely scenario seems to be that which is described on the CDX web site – that reports must be submitted in a pre-specified format, for example, the NIF format (National Emissions Inventory Input Format for toxic air pollutants), which requires a 26-page description of the format and submission techniques.

In this interpretation, the CDX *allows* any format to be uploaded, but the recipient office at EPA defines a particular format, like NIF. From the perspective of the regulated entity, there is no difference between the CDX specifying a format and the recipient office specifying a format – i.e., the cost of implementation is to fulfill the specified format requirements, regardless of who defines the requirements.

For example, the CDX system will allow uploading an Excel spreadsheet which looks the same as the printed report that a water utility currently submits. The CDX system will then archive that document, and forward it to, say, the Office of Water, its intended recipient. The Office of Water, however, could do nothing with an Excel spreadsheet except print it out (and hence end up with the same printed report that would have been submitted on paper) or use it to re-key the data into their own forms (and hence end up with the same amount of work as without electronic documents). The missing component is that the Office of Water needs a piece of software which reads the electronic document and automatically fills in the data into their own forms. That software, called a “parser,” reads a particular format, say, a pre-specified series of fields separated by tab-characters. Without the parser software, there is not much point to electronic document submission. With the parser software, the file format must be specified, and the water utility must upload a file in that specified format. In short, the document's sender and recipient still must agree on what format to use.

The implication is that there is little practical relevance to the CDX system's flexibility in handling any file format. The relevant aspect is what file formats the recipient EPA office requires. Of course it is important that CDX allow flexible file formats so that EPA offices can specify whatever format is needed without concern about CDX compatibility. But the file formats themselves are critical, and EPA offices which expect to receive electronic reports should specify their format requirements as part of the proposed rule. In fact, utilities will be unable to upload

electronic documents *without* knowing the recipient office's file format, which re-emphasizes the centrally critical importance of complete specification.

On costs of creating electronic reports:

A water utility equivalent of an NIF format would require one to three weeks per facility to program LIMS systems. That cost should be included in the cost-benefit analysis: conservatively, an average of one week of technical time, using the technical hourly rate of \$55.56, means an additional per-facility expenditure of \$2,222.40. Assuming that all potential reporting facilities have formatting needs equivalent to water utilities using LIMS, the total cost of implementation would be \$360 million when multiplied by 162,185 facilities.

The development cost for creating a properly-formatted report for electronic submission is by far the largest single cost involved. While the total cost could be substantially reduced by sharing programming costs, the scale of this cost means that the proposed rule should detail the format requirements at length. It is understood that CDX does not specify the format of the uploaded document. But the regulated utilities do need to know the specified format, before they can evaluate whether or not to submit reports electronically. Therefore, the proposed rule should include an appendix of which formats are acceptable to each EPA office.

On EDI, CDX, and XML:

It should be noted that creating a report in a particular format, like NIF, results in an electronic document which is indistinguishable from those sent via EDI. Both have a specified record layout, with defined column headings and field separators. The distinction is then only that an EDI file is transmitted via a VAN system or private modem connection, while the newly created files are transmitted by uploading to the CDX web page. That is a substantial difference, because EDI connections can be run in a fully-automated method, while the CDX web page requires human intervention. But the similarity in file structure means that the costs of developing the software to create files ready for EDI versus ready for CDX are identical.

An XML file is somewhat different because it has a more flexible format – given the tag names, the field separators, line separators, and field sequence do not affect an XML file's readability. Hence software to output XML files would be less expensive to develop than software to output EDI files, all else being equal. However, most LIMS systems do not have XML output capabilities at all at the current time, so the initial development costs would be high. Also, the EPA office responsible for receiving XML files would need a "parser" program to read the XML document, and writing XML parsers is less familiar than writing programs to parse fixed-format EDI-style files.

IV. A. Requirements for Electronic Reporting... Changes. p. 46169

Our approach will be to provide public notice and seek comment on major changes at least a year in advance of contemplated implementation. For minor changes we will provide public notice at least 60 days in advance of implementation. For transparent changes and emergency changes we will make decisions on whether and when to provide public notice on a case-by-case basis. EPA seeks comment on this approach, including the kinds of cases we distinguish and the proposed time-frames for notice. We are also interested in the question of whether the different kinds of cases are or can be defined with sufficient precision to form the basis for workable regulatory provisions, and we welcome any suggestions for alternative regulatory language.

Often changes would be *additions* to the CDX system, as opposed to *replacements*. For example, the Office of Water might begin accepting a new report as of January 1. That sort of change does not affect other reports, and should always be considered "transparent." While it is not transparent in the sense that notification of the public should be made (to popularize its usage), it is transparent in the sense that no one is required to change their current procedure. Hence additions could take place right away, with no need for advance notice at all.

In addition, EPA should distinguish between the types of submissions affected, not just the types of changes. The proposed rule establishes three classes of electronic reports: normal reports which can be submitted with a PIN; reports which require a digital signature; and “business confidential” reports. Those three classes should be clearly distinguished in the rule, by name, so that potential users can readily read the sections of the rule applicable to them. In particular, facilities which can use PIN submissions should not have to sift through several pages of details about digital signatures to find the sections relevant to their facility.

IV. B. 3. Electronic Records with Electronic Signatures. p. 46170

First, a signed electronic record must contain information associated with the signing that clearly indicates the name of the signer, the date and time when the electronic record was signed, and, the meaning associated with the signature (such as review, approval, responsibility, authorship, etc.); second, electronic signatures must be linked to their respective electronic records to ensure that the signatures cannot be excised, copied or otherwise transferred so as to falsify an electronic record by ordinary means; third, this information will be subject to the same controls as those for electronic records and must be included as part of any human readable form of the electronic record (such as electronic display or printout). EPA seeks comment on whether these criteria are appropriate and whether—taken together with the general criteria—they are sufficient to ensure that signatures associated with records fulfill their purpose. EPA also seeks comment on whether these criteria are appropriate for the maintenance of electronic records containing digital signatures.

EPA seeks comment on whether this provision should be expanded to accommodate some of possible procedures for archiving digital signatures.

Most water utility reports to EPA do not require signatures, and those that where states do require signatures are lax in being enforced by states. The general rules should be to maintain the current level of security and responsibility rather than increase it simultaneously with other changes. Attempting to institute both changes at once threatens failure of both, while instituting electronic submissions separately could readily lead to increased security and responsibility later, once successfully implemented on its own.

IV. B. 5. Storage Media Issues . p. 46170

For example, a CD-ROM version of a record originally stored on electromagnetic tape will not satisfy federal record-keeping requirements unless the method for transferring the record from one medium to the other employs error-checking software to ensure that the data is completely and faithfully transcribed. EPA seeks comment on whether this criterion is sufficient to ensure that the integrity and authenticity of the electronic record is maintained throughout its required record retention period.

Water utilities keep paper records for purposes other than EPA reporting. Hence this issue is moot – until and unless EPA regulates against keeping paper records, they will be the storage method of choice.

The need for paper records is likely to be true for most other types of public utilities as well. Hence it will be common for agencies that send electronic documents that they maintain paper records in addition to electronic document records.

IV. B. 6. Additional Options. p. 46171

EPA is also seeking comment on the general feasibility of converting existing paper documents—including litigation-sensitive records—to electronic documents, as well as comments on the strengths and weakness of existing technologies available for this purpose.

Converting existing paper documents to electronic form is an expensive endeavor. It is generally not simply a matter of collecting up the electronic equivalents of paper documents and storing them in a consistent manner – the electronic documents must be created from scratch.

Submitting future electronic documents will require developing software that will do the necessary formatting for future paper documents as well as past paper documents, i.e., the same software that facilities will use for electronic data submission could be used for converting past

documents. Hence there is no net software development cost, and the only cost is the staff time to create, inspect, and organize the electronic reports.

The most sensitive issue from a litigation perspective is that facilities must ensure that the electronic versions are the same as the paper versions. That requires inspection of the previously submitted paper document and comparison to the new electronic version, which means physically locating the paper version to make the comparison. After inspecting and confirming that the data and totals are identical, the authorized signatory could electronically sign the new electronic document and store it in the permanent electronic storage location.

Most water utilities must keep permanent paper reports to fulfill requirements of the state or locality, and hence electronic storage does not apply to drinking water reports. Perhaps some water utilities will use electronic storage in addition to paper storage, for its added convenience. But the primary benefit – removing the physical files – does not apply to water utilities.

IV. C. Authorized State and Tribal Programs, p. 46171

EPA wishes to balance multiple objectives of minimizing administrative burden on States, providing State flexibility for varying State approaches, and ensuring that State systems are robust enough to meet the demands of a strong enforcement capability. This proposal provides for State flexibility by specifying performance criteria rather than requiring specific technologies, and balances other objectives through use of a hybrid process for approving changes to authorized State and tribal programs. EPA solicits comment on whether another approach should be taken to State and tribal program modification or revision for electronic reporting or record-keeping.

From the perspective of water utilities, an EPA requirement that states accept electronic documents would be a great benefit. Doing so would create for water utilities (and for all other state-regulated entities) the same possibility of electronic data submission as facilities which report to EPA directly. Without a mandate for states to accept electronic documents, water utilities do not have the option of electronic data submission unless and until their state establishes their own version of CDX.

Of course, some states will establish a state version of CDX without an EPA mandate (California already has, for example). The EPA estimates that five states per year will establish electronic data submission. That does not necessarily mean that those five states will allow utilities to submit electronically to the state agency – only that the state agency will submit electronically to EPA. In other words, electronic data submission (with the state acting as the reporting agency) does not require electronic data acceptance (with the state acting as the regulating agency).

While there is a burden on states to establish an electronic data submission system, the establishment of a state version of CDX for electronic data acceptance is a substantially greater burden. That burden would entail developing software equivalent to the EPA's CDX, at a cost of several million dollars. EPA assistance – either as technical assistance in software development or as financial assistance for development costs – would have a substantial effect in this area. Without EPA assistance in state CDX development, water utilities and other state-regulated utilities will not benefit much from electronic data submission, since the states will not undertake the burden of developing a state CDX. Even the estimated five states that undertake electronic data submission as reporting entities may not undertake electronic data acceptance as regulating entities – which they must do in order for individual utilities to benefit.

State agencies have the most to gain from electronic data acceptance, since state agencies receive numerous small reports from numerous utilities and generally re-key the data into electronic format. The potential gain minimizes the cost of an “unfunded mandate.” From a water utility perspective, an EPA mandate on states – but not on individual reporting entities – would be a benefit. To deal with the unfunded mandate issue, the state mandate could be funded by EPA.

IV. D. What Criteria Are EPA Proposing? p. 46172

Generally, documents not requiring signature are less likely to play a role in criminal prosecutions; therefore, the criterion that refers to “Validity of Data” [and “electronic signature method”] might not apply to systems that receive such documents. EPA invites comment on the exclusion of these criteria in cases where systems will not receive signed documents or documents used in litigation or enforcement and criminal proceedings. EPA invites comment on whether it would be worth developing the alternative set of criteria for systems that exclude electronic signatures.

Excluding electronic signature criteria in cases where litigation is not an issue is a great benefit. The electronic signature is the most burdensome component of the electronic data submission rules, because the litigation potential requires substantial legal detail in its specification and execution. Excluding those rules from those reporting agencies for which they are not a current requirement would greatly increase the likelihood of an entity choosing to do electronic reporting.

Further, we would recommend creating two sections of the proposed rule – one for entities who are reporting electronically via CDX, and a second section for those who are reporting with an electronic signature. The rule itself is burdensome to read, and the length of detail concerning electronic signatures will intimidate many potential electronic data reporters. The rule without the electronic signature component is fairly short and understandable – with it, the rule is much more complicated. Readers of the rule who do not require electronic signatures must currently piece out which parts apply to them, and skip over substantial sections of legal requirements which are irrelevant, while looking for the much briefer parts which are relevant to them. That should be changed, to have just the brief parts relevant to non-signature reporters all in one section.

As detailed elsewhere in these comments, adding an electronic signature requirement where one does not currently exist would create a substantial new burden on water utilities. It works at mixed purposes – attempting to encourage electronic data submission while simultaneously increasing the legal accountability of documents. Those mixed purposes are at odds with each other, since increasing legal accountability means more work for the regulated entity, which discourages the use of electronic data submission at all. EPA’s primary goal is to establish a means of electronic data submission and encourage its use – other goals, such as increasing legal accountability, should not be done at the same time.

IV. D. 3. Submitter Registration Process. p. 46174

It should be added that EPA proposes to require registration of any individual who submits electronic documents to an electronic document receiving system on behalf of an entity, regardless of whether the individual is issued an electronic signature, because EPA believes that registration strengthens system security and data integrity. Accordingly, the registration process for an individual who is not being issued an electronic signature will simply omit the signature-specific requirements. EPA seeks comment on this more general registration requirement.

As discussed above in terms of electronic signature requirements, the EPA rule should explicitly separate out in sections of the rule the requirements for electronic signatures from the requirements for non-signature-based submissions. The registration process for non-signature-based submissions should be defined in a separate section of the rule so that entities for which it is applicable can readily read and understand them without having to go through the intimidatingly long sections on electronic signatures which are inapplicable to them.

ICR 2002.02 also discusses an enhancement of CDX to support confidential business information (CBI). That would be a third method yet, with separate rules. None of those rules would apply to water utilities, since all reports are publicly available (nothing confidential). CBI and electronic signatures should similarly be in separate sections of the EPA rule to avoid confusion.

IV. D. 4. Electronic Signature/Certification Scenario. p. 46175

“WARNING: By signing this report, you agree that you are [name of authorized signature holder], have protected the security of your electronic signature as required by the electronic signature agreement which you signed on [date of most recent signing], and are otherwise using your electronic signature in accordance with that agreement.” —Although we are not proposing to codify this language in the rule. EPA seeks comments on whether this language should be codified, and, more generally, on whether the three conditions to be satisfied prior to signing are necessary and sufficient to establish that the signature was affixed with the requisite intent.

There are two evidentiary issues with regards to electronic documents and signatures: First, are electronic documents admissible as civil evidence? And second, can electronic signatures provide evidence of criminal fraud?

In *United States v. MWRA and MDC*, (Civil Action No. 98-10267-RGS, ruling by US District Judge Richard J. Stearns on May 5, 2000), the EPA charged the Massachusetts Water Resources Authority with violating fecal coliform rules when MWRA decided to stop filtering source water. The federal court accepted electronic data and electronic reports as valid evidence, and both sides accepted the electronic record without legal question. Hence there is precedent for the introduction of electronic data as evidence in civil court, without electronic signatures. While this instance did not set a legal precedent (because the issue was not discussed in the judgment, it is *obiter dictum* but not precedent), it does establish a history of evidentiary acceptance.

In the discovery process, EPA downloaded all MWRA data directly from MWRA’s database (an Oracle database covering 1996 to date). In other words, the reports previously submitted to EPA were superseded by a more complete record from the source database. That pattern was similar to that used in the ongoing Boston Harbor wastewater case (*United States v. MDC*, Civil Action No. 85-0489-MA under District Judge A. David Mazzone). Electronic data was and is introduced as valid evidence.

A typical pattern for a legal case would be that submitted reports are used to determine that a problem exists, but before the case gets to court, the normal discovery process replaces the submitted reports with data from other sources. Often those sources are the same sources from which the submitted reports were produced, as in the MWRA instance.

The relevance to the currently proposed EPA rule is that submitted reports are typically not used as legal evidence, but only as a means to initiate a legal proceeding. Hence for cases involving enforcement of EPA regulations, it is moot whether the submitted reports can have their chain of custody traced, or whether they can be repudiated – the originating database clearly cannot be repudiated and its custody is not an issue. In short, the concerns about legal validity of electronically submitted reports do not apply to civil enforcement actions.

Legal validity of electronic reports *would* be at issue in the case of fraud. A fraud case, for example, might consist of a water utility submitting false reports which showed compliance with EPA regulations where in fact the utility was out of compliance. The submitted reports would provide evidence of which person was responsible for falsifying the data, and if the report were submitted electronically, the electronic signature would be relevant to determining criminal responsibility.

Researching legal cases where false reports were used as evidence might prove useful in determining the need for electronic signatures and other means of verification in electronic reporting. Some EPA cases involving fraudulent report filing include:

- ? *U.S. v. Saybolt, Inc., et al.* (District of Massachusetts), Cr. No. 98-10266 WGY (D. MA), Aug. 18, 1998. CAA violations involved data falsification charges, i.e., the company sent EPA falsified reports of laboratory tests performed on petroleum products. Two persons were charged and in a plea agreement the company agreed to pay a \$4.9 million fine.

- ? *U.S. v. Louisiana Pacific Corporation, et al.* (District of Colorado), May 28, 1998. Filing false reports with the Colorado Department of Public Health and Environment and the Environmental Protection Agency under the Clean Air Act. Two persons were convicted criminally, and the company paid a \$36.5 million fine.
- ? *U.S. v. Hess Environmental Laboratories Inc., et al.* (Eastern District of Pennsylvania), Nov. 10, 1997. False lab results were provided to schools, hospitals, local governments and businesses and were relied upon by the EPA, Pennsylvania Department of Environmental Protection and the U.S. Department of the Army. Three persons were convicted of criminal charges.

Typical water utility reporting procedures include review of reports by a laboratory technician, a laboratory manager, and a compliance manager. Hence any fraud case against a water utility would involve the complicity of several persons, as in the cases above. The single person who signs an electronic report might be the only person legally liable, but in a water utility context could not be the only person criminally complicit.

IV. D. 4. Electronic Signature/Certification Scenario. p. 46176

EPA seeks comment on whether the number and type of responses from the electronic document receiving system adequately address the issue of spurious or compromised submissions. Specifically, we seek comment on the requirements placed on the automatic acknowledgments. In addition, we are interested in views on whether it will be generally feasible for electronic document receiving systems to create copies of record with all the attributes we are proposing that they have, and whether all of these attributes are necessary for the copy of record to fulfill its intended purpose.

We will not comment on the legal and technical aspects of recording and acknowledging electronic data submissions, but instead will comment on the implications for typical water utilities.

The automatic recording and acknowledgement of received reports is a benefit to small utilities, because it ensures that the report has been received. By having a formal acknowledgement record, the reporting facility can be confident of having proof of a timely report submission. EPA should ensure that the CDX's acknowledgement form provides sufficient proof for that purpose. For example, it should have a date and time of receipt and a code which verifies the date and time so that it cannot be altered.

An additional benefit cited by several water utility managers is the ability to submit reports up to the last minute of the deadline, rather than a couple of days prior to the deadline to account for mailing time. EPA should expect to receive numerous reports immediately prior to any reporting deadline, and should anticipate usage surges at those times and be able to handle such surges. In the case of a system failure on the part of the CDX, there should be included in the proposed rule an automatic extension of any affected filing deadlines until the CDX returns to operation, plus a period of time until the next normal business hours.

Implicit in sending an acknowledgment is that water utilities and all other electronic data submitters must keep the electronic acknowledgement in some organized manner. Since it will not have an electronic signature, the content alone should be sufficient to provide evidence of timely report submission. Electronic data submitters will presumably be required to store an electronic copy of the acknowledgement form for as long a period as they are required to store the electronic document itself.

The content of the electronic acknowledgement should also be sufficient to verify that the submitted report had proper content, not just that it was submitted in a timely manner. Some sort of "hash total," which would more or less uniquely identify the content, would suffice. If EPA and the data submitter then disagreed on the content of the submitted report, the data submitter could check the hash total of the document they claimed to have submitted and hence provide evidence of a proper submission. EPA should supply the algorithm for calculating the hash total

so that data submitters could verify that the whole document was received in its intended form – i.e., EPA’s hash total in its acknowledgement should match a hash total which could be calculated by the data submitter.

It is unclear from the proposed rule how EDI submissions will handle electronic acknowledgements. The normal means of using the CDX would be that a person uploads an electronic document to a CDX web page and receives back an acknowledgement document which is then downloaded and stored. Presumably an equivalent acknowledgement document is sent in response to every EDI submission.

IV. D. 6. System Archives. p. 46176-7

EPA also proposes to require that electronic document receiving systems maintain the contents of the transaction record described above—including the copy of record—for as long as they may be needed for enforcement or other programmatic purposes. EPA seeks comments on these archiving criteria, and especially on whether there are any issues raised by the need to maintain the copy of record, which includes electronic signatures—over long periods of time.

From the water utility perspective, most facilities would keep a permanent copy of electronically submitted documents, but it is assumed that the proposed rule does not mandate such storage, especially since the paper equivalents are already stored under state and local requirements.

For EPA’s permanent storage requirements, the usual storage safety rules should apply: Keep multiple copies at multiple physical locations. Over long periods of time, the risk is that one storage medium would become outdated, and then numerous reports would have to be converted and/or transferred to a newer storage medium. That problem can be alleviated by routinely storing the submitted reports on multiple media.

For example, the reports could be stored upon receipt on a hard disk, which is periodically replaced as it gets full, and permanently stored off-site. The daily backup routine could then write all newly received reports onto a CD-ROM, which is stored off-site. The weekly backup routine could write the week’s reports to a magnetic tape, which is stored in a different location off-site. Redundant backup methods would suffice to ensure that at least one of the copies is both readable using future technology and that the medium itself would survive a long duration of storage.

IV. E. What Are the Costs and Benefits? p. 46177

EPA estimates that CROMERRR could result in an average annual reduction in burden of \$52.3 million per year for those facilities reporting, \$1.2 million per year for EPA, and \$1.24 million for each of the 30 states that were assumed to implement programs over the eight years of the analysis. EPA requests comment on whether the underlying assumptions and the methods used in the cost benefit analysis provide a realistic estimate of the costs and benefits associated with electronic reporting and recordkeeping.

It is assumed that the costs and benefits are derived from the “Supporting Statement for ICR 2002.02 ‘Electronic Reporting and Recordkeeping – Proposed Rule’.” The figures used in this comment reflect the estimates in that ICR (referred to as “ICR 2002.02”). This comment also refers to the “State Guide for Environmental Reporting of Environmental Data,” (referred to as the “SEES Report”) prepared by the National Governors Association’s SEES Project, in particular Appendix C: “A Model Benefit-Cost Analysis of Environmental Electronic Reporting Programs.” This comment addresses several relevant figures which make up the CROMERRR estimate of annual reduction of burden:

Number of Facilities: ICR 2002.02 estimates a total of 162,185 facilities which could potentially participate in electronic reporting. However, an estimated 136,037 of those, or 84%, report to states instead of reporting directly to EPA (Table 3, p. 27). Almost all water utilities fall into that category; this is addressed in detail above. Unless states have a means of accepting electronic submissions, 84% of reporting facilities have no means to report electronically. The

costs and benefits of the CROMERRR rule should reflect that the rule, as written, only applies to 16% of all reporting entities.

Labor Burden Reduction: The SEES Report estimates (p. 191), based on EPA studies, that labor hours in preparing environmental reports could be reduced by 10% to 30% by electronic reporting. That estimate is in line with estimates by water facility managers, but should be balanced against an increase in computer maintenance time. Because technical labor is more expensive than the clerical labor being replaced, the 10% to 30% *labor* savings should be decreased when calculating actual *cost* savings. In addition, the greater availability of electronic data will *increase* the number of computer-based reports requested. As a result, as detailed in comments above, there is no net cost savings but a transfer from clerical labor to technical labor.

Data Quality Increase: The most important benefit of electronic reporting is that data quality will improve, because of more timely availability of data and because of improved accuracy by avoiding the error-prone clerical steps. This benefit, while intangible, should be summed with the tangible burden reduction costs. The SEES Report (p. 193-4) outlines a method to quantify intangible benefits, including improved data quality.

Time Estimates for CROMERRR Compliance: ICR 2002.02 has several time estimates which are unrealistic. In general, the time estimates account reasonably for the *actual* time spent implementing the task, but not for the *preparatory* time that occurs before the task. For example, 0.75 hours of managerial time and 0.75 hours of technical time are estimated for reading the CROMERRR regulation itself (Exhibit 1, p. 32). While 45 minutes is a reasonable estimate of the *actual* reading time, there is substantial *preparatory* time that is not counted – such as a legal review, a managerial meeting to decide about implementation, a technical meeting to decide on methods, etc. Accounting for those preparatory events adds substantially to the time estimates, and since the number of hours are multiplied by 162,185 facilities, would add substantially to the overall burden on facilities.

Computer Overhead: ICR 2002.02 assumes that the current computer system is adequate for running the software for electronic reporting. While it is likely true that most existing computer systems are adequate for the requirements, there is an increase in marginal use of the computer system, both in terms of data storage and computer usage, which is not accounted for. Increasing the use of computers should in general be accounted for by a line item for “computer overhead,” for which the primary cost is additional technical staff hours.

Data Format: The CROMERRR proposed rule makes clear that CDX can accept data in any format. That is irrelevant from a perspective of burden to water facilities and other environmental reporting agencies – while the CDX itself does not require a particular format, the EPA office which ultimately receives the report *will* specify a format. Most relevantly for estimating the burden on facilities, preparing the report in electronic format will require a substantial investment in formatting the reports electronically. The CDX cost estimates ignore that substantial burden because the format is defined by a different office. Yet that burden is likely the single largest dollar cost to any reporting facility. The burden reflects several days to weeks of technical time to program LIMS systems to output an electronic report in a particular format, which entails a cost of several thousand dollars per facility.

Electronic Signature Certification: ICR 2002.02 states (pp. 16-8) that all costs associated with electronic signature certificate issuance and management are counted as a burden under GSA’s ICR, since the methodology has previously been defined. As with data formatting, facilities are interested in the total burden of electronic reporting, not in the amount assignable to CDX. Some facilities may already have their electronic signature certificates, but many do not – a percentage should be estimated and the total burden calculated based on that. Obtaining the electronic signature certificate is a major cost item to facilities, and cannot be discounted simply because some facilities may already have completed the necessary paperwork for a different purpose.

IV. E. 1. Scope and Method. p. 46177

EPA invites comments on the approach used for conducting the analysis and on the list of ICRs analyzed—whether this list encompasses the spectrum of EPA requirements impacted by CROMERRR and what additional information collections, if any, should be incorporated into further analysis.

The most important component of electronic data submission is the format that the recipient EPA office will require. The data format is not included in the description of the CDX because the CDX itself can handle any format, but in practical terms, the EPA office which ultimately processes the submitted report will be defining formats in detail. The format definitions, and their cost, are omitted from consideration in the CDX. Those costs are not trivial: as pointed out above, the NIF format (National Emissions Inventory Input Format for toxic air pollutants), requires a 26-page description of the format and submission techniques. A more complicated format, like the current UCMR rule, occupies five volumes and well over 200 pages.

IV. E. 1. Scope and Method. p. 46178

As an example, EPA program X has identified that the mailing of form B requires 10 minutes per submission. The costs for facilities choosing to submit electronically would take into account the elimination of mailing, and the costs for electronic reporting under that program would be reduced by 10 minutes for each submission. EPA requests comment on ways to improve an analysis of this type as well as suggestions for other approaches that may better identify the potential costs and benefits of the proposed electronic reporting and recordkeeping rule.

From the perspective of water utilities, the cost savings in electronic data submission is negligible. For reasons detailed below, it is unlikely that electronic data submission would ever pass a Cost/Benefit Analysis with a net cost savings. A better analysis would encompass quality improvements instead of financial savings, because quality improvements can be substantial.

While it is true that some time would be saved by avoiding preparing a mailed report, that time will be replaced by the time required to perform the upload to the CDX. This is especially true for water utilities and other facilities which produce only small reports (typically one page), since the brief preparation time means that the person preparing the report will watch the computer do the work. In the case of more lengthy reports, where the preparer can realistically do some other task while the electronic report is being collated and printed, there is potentially a net cost savings to electronic submissions. But for small reporting entities, electronic reporting simply switches time from one task (preparing the physical mailing of the report) to a different task (overseeing the electronic preparation and uploading of the report).

While it is also true that postage would be saved by not mailing paper reports, this also has no net savings for small reporting entities. The cost of postage itself would indeed be reduced marginally, but electronic submissions would create a new marginal cost for the increased usage of the computer system. Again, the net effect on cost would be to transfer the cost from the postage budget to the computer maintenance budget.

While it is most true that avoiding re-keying of water utility reports at state agencies would provide cost savings, even that substantial reduction in labor would be partially replaced by an increase in labor for computer software maintenance. Once again, the net effect on cost would be to transfer the cost, in this case from clerical staff to technical staff.

A better analysis would focus on the improved quality of the data. Re-keying data is notoriously inaccurate and introduces substantial errors into the data, because it is difficult for even an experienced clerk to 100% accurately type in a column of figures. Electronic data submission would avoid that source of error entirely. Re-keying also entails a delay between the receipt of the data and its availability – often a substantial period of time if clerical staff is backed up by the simultaneous receipt of reports from utilities across the state. Electronic data

submission would allow near-instant analysis as soon as the report were received and electronically processed.

Electronic data submission would improve analytical techniques as well as the accuracy of the data. Having water quality data quickly available, for example, would allow for statewide water quality analysis on a quick-turnaround basis. Such instant analysis would allow for decision-making on a much more “real-time” basis than is currently available. The prospect of additional analytical reports based on electronic data submission is the reason we estimate that *all* clerical labor savings would be converted to technical labor time – because more analysis reports would be requested. While that would not yield a net cost savings, it *would* yield a quality improvement.

Electronic data submission would also provide a greater convenience for reporting entities. Utilities could file reports right up to the deadline, instead of two days prior to allow for mailing time. Utilities could also gain confidence that their reports have been properly received and processed, and are less likely to suffer negative consequences due to re-keying errors at the state level. Like quality improvements, these gains are not readily convertible into dollar savings.

It is worthwhile to implement electronic data reporting from a quality improvement perspective (which is difficult to convert to a dollar value) even if from a cost savings perspective the net savings is small.

V. E. 1. Scope and Method. p. 46178

EPA is seeking comments on the implementation rates for reporting and recordkeeping as described in this proposed rule. For EPA, the average annual cost to implement and operate electronic reporting and record-keeping is \$25.8 million, and the average annual cost savings compared to equivalent paper-based systems is \$1.2 million. The average annual cost to implement an electronic reporting system is \$1.1 million for each state, and \$1,273 for each facility. The net average annual cost savings of electronic reporting compared to an equivalent paper-based submission is \$1.24 million for each state, and \$1,140 for each facility. The total average annual costs of implementing and reporting electronically for all facilities is \$3,420 million, which presents a net average annual savings for all facilities of \$52.3 million over current paper-based reporting. The average annual cost to implement a new electronic record keeping system is \$40,000 for each facility, and the net average annual cost savings for operating the electronic record keeping system is \$23,080.

The \$1,273 cost per facility for implementing electronic data submission is too low. Looking at Exhibit 1 in “Supporting Statement for Information Collection Request Number 2002.02 ‘Electronic Reporting and Recordkeeping—Proposed Rule’”, the cost apparently is based on the estimates there. But those estimates exclude decision-making time, counting just 2 minutes to read the invitation letter while discounting any time to make the decision to implement usage. A typical facility might have two one-hour meetings with several key managers, plus legal & technical people. Counting that meeting, (3 managers, one legal, one technical, for two hours, times 162,185 respondents), would increase the total by \$408.33 per facility, or by \$66 million as a one-time expenditure for setup.

Also ignored is the time required to read the final rule itself. It is unlikely that any facility would implement a system which legally binds its employees via electronic signatures without having those employees or their legal staff read the rule. One hour of legal staff time for each facility adds \$99.78, or \$16 million in setup expenditures. That time can be substantially reduced by separating the rule into two versions, one applicable for facilities which submit reports with signatures and one for non-signature submissions. The bulk of the proposed rule deals with the electronic signature, and facilities without that requirement currently need to read through the electronic signature rules only to discover which other parts of the rule do apply to them. The proposed rule without the electronic signature text would be substantially shorter and clearer, and hence could be read in the two one-hour meetings estimated above. It is unstated what percentage of facilities EPA estimates would be submitting reports with signatures versus without, but that percentage would reduce the \$16 million estimate here.

Also ignored are the general overhead costs of maintaining the computer system. Presumably the marginal cost of additional computer overhead is counted as zero, since it is omitted from the cost estimates (costs for specific activities are accounted for, but not costs of “computer overhead.”). Increasing reliance on computer systems does require additional marginal expenditures in purchasing new storage media, marginally more security checking, marginally more back-up of media, and so on. Conservatively estimating a new marginal expenditure of 10 minutes per week, each facility can expect an additional 8.7 hours of technical personnel per year, which at \$55.56 per hour means an additional per-facility expenditure of \$484.30. Multiplying by 162,185 facilities, the total cost would be \$78 million per year.

For comparison, the ICR 2002.02 estimates \$12,000 per facility for annual maintenance of an electronic record-keeping system (216 hours per year or over 4 hours per week). Also included there is \$5,000 per facility for overhead & maintenance above the actual time spent. While the marginal overhead of an electronic record-keeping system is substantially higher than the marginal overhead of an electronic submission system, some overhead should be estimated.

IV. E. 1. Scope and Method... New software. p. 46179

EPA is seeking comment from reviewers on alternative record keeping approaches and on EPA's assumption that facilities choosing to submit data via XML or EDI to EPA will not acquire new hardware or software.

The assumption of the EPA cost estimates implies that submitting electronically entails simply uploading an electronic report to the EPA's website, i.e., that the report exists in an electronic form already and hence there is no marginal cost for its production: “Companies choosing to submit using web forms will have much lower initial investment costs [than those choosing EDI or XML].”

That is not the case with most water utilities. The dominant software in use at water utilities are “LIMS systems” (Laboratory Information Management Systems), which are normally programmed to print out reports. Re-programming LIMS systems for electronic output requires a period of time from two days to two weeks, depending on the previous LIMS experience of the person doing the programming (who is typically a hydrologist or toxicologist, not a computer programmer).

Using the same \$55.56 rate as above, for an average 5 days of LIMS programming, means a per-facility cost of \$2,222.40. Multiplying by 162,185 facilities, the total cost would be \$360 million.

The programming cost for outputting to XML and EDI is more substantial. LIMS systems can output into fixed-file format (suitable for EDI) but doing so means the reports cannot be easily inspected (since they become just a series of characters). Hence outputting in EDI implies two sets of output: one for inspection of each report, and one for electronic submission. A more substantial setup time would be required to assure that the EDI-formatted version is consistent with the visually-inspectable version. For XML output, LIMS systems currently cannot directly produce XML (perhaps a future version will, but that requires upgrade costs). Hence XML output would require developing a program which uses LIMS output as its input, then converts it to XML code. Either of those formats would entail substantial startup costs.

Allowing EDI format is still a good idea, if the operational time is reduced by automatic data submission. There is no clear benefit of XML format for users of LIMS systems, unless future versions of LIMS include XML built-in output.

IV. E. 1. Scope and Method... Web forms. p. 46179

Companies choosing to submit using web forms will have much lower initial investment costs, but will receive less savings than companies that choose to automate their systems to generate EDI or XML file submissions.

It is understandable that EPA is initially focusing on large facilities which file large reports. But the number of small facilities is much larger than large facilities, and the multiplier effect is enormous. In the short term, there will be cost savings for the large entities for whom the initial system is intended. But in the long term, the potential economic savings is far greater by addressing the needs of the numerous small entities. Even if the individual cost savings is smaller, the net economic effect is greater because of the greater number of smaller entities. Therefore the CDX should be designed for small entities as much as for large entities.

Specifically, using web forms to submit forms via the CDX web site will be the method of choice for most small entities. That submission method should not be dismissed as producing less savings. It will produce less savings for an *individual* data submitter, but will produce more savings *overall* when multiplied by the numerous small entities who will submit via web forms.

V. B. What Are the CDX Building Blocks? p. 46180

To support its various functions, we are designing CDX to incorporate a number of key building blocks, including:

- ? Digital signatures based on public key infrastructure (PKI),
- ? A process for registering users and managing their access to the CDX,
- ? A characteristic systems architecture,
- ? Electronic data interchange (EDI) standards, and
- ? A characteristic environment in which electronic reporting transactions will be conducted.

These building blocks are meant to ensure that CDX can perform the functions of an electronic document receiving system under the proposed rule. EPA believes that these building blocks, taken together, will satisfy the criteria in today's proposal for electronic document receiving systems, but seeks comment on this general question.

The relevant components of the CDX for water utilities are:

1. That the security components are individually includable and removable; i.e., that uploads can be made without a digital signature when not required.
2. That non-signature documents are easy to upload; i.e., that CDX focus on the needs of small reporting facilities as well as large facilities.
3. That the states have some means of implementing a state-level version of CDX, since most water utilities report to the states.
4. That the recipient offices at EPA define the data formats they require, since those definitions are critical to usage of CDX and are a substantial component of preparing to use CDX.

V. B. 2. The CDX Registration Process. p. 46181

EPA will initiate the process by sending you a letter... [Step 1, which] provides a CDX web-site address and access code. [This] may in some cases involve EPA asking for a letter from a responsible company official, on company letterhead, confirming that you have the responsibility to sign and submit the environmental reports in question. EPA seeks comment on the value of the confirming letter, and of providing for these "alternates", and on whether these would impose any unacceptable costs or burdens on regulated entities. ... [Step 2] After the ACES CA validates your identity, you will receive a letter notifying you that your certificate is ready; notification will include a PIN for access to the certificate retrieval website. [Step 3] Under the ACES approach, the personal information you supply for purposes of "identity proofing" must include at least three items. EPA seeks comment on any aspect of this "identity proofing" approach, and specifically on the need to have the CA collect the personal and business information listed above, as well as any comment on the ACES certificate issuance process as a whole.

A notable component of this registration process is that it requires at least 3 delays for items to be sent by mail – that entails a minimal period of 6 to 9 business days for the registration process to be completed (because mail delivery takes 2 to 3 days each). This imposes a lack of a way to “try out” the electronic submission process – the submitting agency must, after deciding to try electronic submission, go through a series of step that will not result in the first electronic submission for 1 to 2 weeks after the decision is made. In other words, there is no means of quick feedback about whether the process is appropriate for the agency unless that agency makes a substantial time commitment. Hence agencies which are unsure about whether they would benefit from electronic submission are less likely to try it, since the trial itself is rigorous.

A possible solution would be to allow a “dry run” upload method using the CDX, where all the CDX methods are implemented, including the submission of a “guest” electronic signature and the return of an acknowledgement form. In the “dry run” mode, the submitted report is not considered formally submitted because it lacks an actual electronic signature. The purpose would be to allow people to test out the CDX system for complexity and utility.

V. B. 3. CDX Architecture... FTP. p. 46182

To provide for the desired flexibility, the EPA server is being designed to accept data via a variety of transfer mechanisms in variety of formats, ranging from Internet File Transfer Protocol (FTP) submissions of spread-sheet files to standards-based electronic data interchange (EDI) transmissions via private value-added network (VAN).

For water utility users, most reports are one-page or at most a handful of pages. Hence the means of uploading that is convenient for small files would be superior. A web-based interface – i.e., a URL on the EPA’s CDX web site – with a “Browse” button to select the electronic document and then an “Upload” button to submit it – would seem ideal.

FTP access is just about as easy and quick for small documents, but the FTP interface is certainly not as familiar to water utility staff, since the typical user would be the laboratory manager and not the I.T. staff.

EDI transmissions are more appropriate for large reports, which apply to states when submitting the consolidated reports of many water utilities, but not to the water utilities themselves.

However, as detailed above, the relevant aspect is the format required by the recipient agency, not the transfer mechanism nor the flexibility of formats accepted by CDX. In other words, to submit electronic documents will require details of format requirements even though CDX makes no such requirements.

V. B. 3. CDX Architecture... client system. p. 46183

To operate this CDX client software, and interact with the CDX server, your PC system will have to have: Internet access; at least a 486 processor; 2 to 5 MB of available hard-drive space to install program software; access to a printer; and Microsoft Windows 95, 98 or NT 4.0. EPA seeks comment on whether these system requirements impose unacceptable costs or burdens on regulated entities.

The hardware and software requirements are unlikely to pose a burden because the target utility is large enough that such systems are the norm. The system requirements do exclude Mac users.

Until this point in the description of CDX, however, it was not made clear that users would be downloading software (as opposed to using a standard browser to access the CDX web site). This has several implications:

- ? The time estimate for using the CDX for the first time is too low. Installing a 2 to 5 Mb piece of software is comparable to installing Winword (5 Mb) or MS Access (3 Mb), which require 10 to 15 minutes.

- ? The software will be periodically replaced by newer versions – if a software upgrade is required for use of the CDX, that upgrade time should be accounted for as well.
- ? Presumably the same software works on all operating systems (i.e., there is not a different version for Windows 95 vs. Windows NT). If that is not the case, then upgrading one’s operating system will require a new software installation, and that time should be accounted for also.

V. B. 3. CDX Architecture... machine specificity. p. 46183

When the private key is created, this can be done in a way that prohibits its export. If this option is invoked, the private key can never be moved—whether to a floppy or to another computer—so if a signature-holder had to move to another machine, the existing [key] will have to be abandoned, and he or she will have to apply for a new certificate.

Applying for a new certificate means a 6 to 9 day delay to allow for 3 pieces of mail to be passed back and forth. Perhaps the identity-establishing step could be skipped, but there would still be a delay while one piece of mail were in transit. This implies several options:

- ? The person changing machines must plan in advance to change machines, and would simultaneously own two digital signatures during the overlap period. This would require EPA to allow the same person to be registered twice for the same task, since it is likely that advance planning would be done by several weeks, to allow for the computer hardware to arrive and be set up.
- ? If the person changing machines is doing so on an emergency basis (e.g., because their computer irreparably crashed), a second person at the facility would have to take over responsibility for submitting all electronic reports, during the interim period until a new certificate is operable. Hence a second person with submission authority would become more of a requirement. A third person with submission authority would become more or less required also, in case the first person’s computer crashed while the second person was on vacation, for example.
- ? This situation applies to computer crashes which are considerably less serious than one which requires replacing the computer hardware. A more typical computer crash problem requires replacing the operating system, which wipes out and replaces the “registry” (presumably, some sort of registry entry is the means by which a private key cannot be exported). A typical computer under daily usage might require an operating system replacement every 1 to 2 years, for reasons ranging from a virus infection to too much conflicting software.
- ? In addition, the same registry replacement occurs whenever the operating system is voluntarily upgraded to use the latest version (Windows 2000 vs. Windows 98 or Windows 95) . An operating system can be expected to be replaced on average of once per year, for the combination of voluntary or involuntary reasons. Hence the private key & certificate replacement should be expected to occur annually, and the costs adjusted to reflect that, should this option be chosen.

V. B. 5. The Transaction Environment. p. 46185

In our design of this three-part scenario (data review, signature process, and acknowledgment), our major goals have been to make CDX simple, intuitive and easy for submitters to use, while—at the same time—ensuring that a submitter knows and understands what he or she is certifying, the meaning of affixing a digital signature to the electronic document, what has happened, and what EPA considers to be the document that was submitted. EPA seeks comment on the appropriateness of these goals and whether more or less should be designed into CDX to ensure that it meets these goals.

A simple, intuitive, easy-to-use interface is an obvious goal, as is that the submitter know and understand what has happened. To summarize points from elsewhere in these comments:

- ? The CDX web-page upload interface should differentiate early in the process between signature-required documents and those which are i.d.-and-password only – perhaps split onto two different web pages with different instructions. The purpose is to allow a simpler interface without the electronic signature details where possible.
- ? The CROMERRR rule should make that same differentiation in its description of the requirements and in all its definitions – perhaps split into two sections describing the two different scenarios. The purpose is to allow a simpler rule so that data submitters can read the rule without having to work through the electronic signature details.
- ? The CDX should allow a “dry run” for data submitters to test out the system, using a “guest” registration and “guest” signature.
- ? The acknowledgement sent back from EPA should be in a downloadable document form, which includes some means of verifying the date and time of submission and an encoded hash total of the submitted content.
- ? In general, existing levels of security and accountability should be maintained at current levels rather than increased. Any such increases in security and accountability above current levels should be implemented after the CDX system is well established.
- ? In general, the needs of small report submitters should be considered as important as the needs of large report submitters. While large reports have greater individual cost savings, the greater number of smaller reports submitted means a greater economic benefit from encouraging the electronic submission of smaller reports.
- ? The EPA offices which ultimately receive the data should be involved in the CDX development process, and in particular should define the format that submitted reports must have. While this is not part of the CDX itself, it is integral to *use* of the CDX.
- ? State agencies which act as the intermediary recipient of numerous utility reports should be encouraged to use a state-level version of CDX. This encouragement could be both by technical assistance and/or financial assistance.
- ? Labor and cost savings of electronic data submission are not substantial compared to paper submission, because most costs are transferred from clerical and mailing expenses to computer staffing and increased computer overhead expenses. However, for the same cost, substantial quality improvements will be realized.
- ? The quality improvements include more thorough analysis, faster feedback, and greater accuracy.

VI. C. Paperwork Reduction Act... Time. p. 46186

It is expected that tasks associated with system registration will take an average of one (1) hour per registrant/entity and the estimated number of likely respondents is 324,370. Total annual start-up costs are estimated at \$10,700,000 and annual operations and maintenance costs are estimated at \$5,100,000.

We summarize our comments above into a list of all the expenses which we believe were missed or made too low. All of the figures below are conservative estimates of the missed expenses.

- ? Legal staff time reading the CROMERRR final rule: \$99.78 per facility or \$16 million nationally.

- ? Managerial staff meetings as part of the decision-making process of adopting electronic data submission: \$408.33 per facility, or \$66 million nationally.
- ? Additional computer overhead for electronic submission software and/or electronic data storage: \$484.20 per facility, or \$78 million nationally.
- ? Formatting electronic data to needs of recipient office at EPA: \$2,222 per facility, or \$360 million nationally.

From the water utilities' perspective, the more that is done at the EPA and state level, the better. In general, that implies creating an easy-to-use system which requires minimal preparation for use and minimal time to operate. From an economic perspective, ease-of-use is the single most important issue, because of the multiplier of any costs applied to end users. Specifically, because EPA expects to have 324,000 users, there would be an overall economic benefit (summing up the costs to all parties) even if EPA had to expend 324,000 times as much effort as any end user. Put concretely, the economy as a whole would be equally as well off if EPA spent 324,000 minutes of work making the system easier to use and avoiding 1 minute of work for 324,000 utilities. That translates to a worthwhile EPA expenditure of 2.5 full-time equivalent years of effort to avoid 1 minute of work at all utilities, or 150 full-time equivalent years of effort to avoid 1 hour of work at all utilities.

VI. C. Paperwork Reduction Act... Burden. p. 46186

Comments are requested on the Agency's need for this information, the accuracy of the provided burden estimates, and any suggested methods for minimizing respondent burden, including through the use of automated collection techniques.

We summarize our comments above into a list of pro's and con's from the perspective of water utilities:

WATER UTILITIES: PRO'S

- ? Utilities have a record of timely submission of reports.
- ? Utilities can submit reports up until the last minute due, rather than accounting for mailing time.
- ? More accountability on both receiver and sender sides.
- ? Large quality improvement because of more timely analysis.
- ? More accurate data due to fewer transcription errors.

WATER UTILITIES: CON'S

- ? Drinking water utilities cannot use CDX to report directly to EPA because states claim primacy and hence almost all utilities report to state agencies.
- ? CDX is not designed as a model for states to use for receiving electronic data; such a model is needed, or funding for states to develop a model.
- ? Labor and cost savings would be transferred from clerical staff and clerical costs to computer staff and computer overhead, rather than generating substantial net savings.
- ? Electronic data storage is not a benefit for water utilities because state and local laws require keeping paper records.