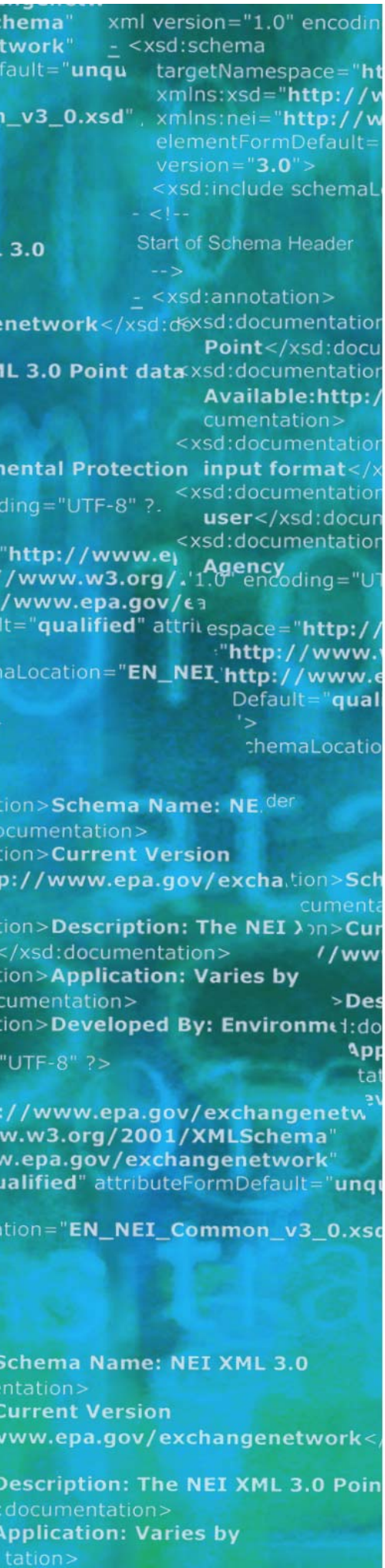

Integrated Compliance Information System – National Pollutant Discharge Elimination System (ICIS-NPDES)
Schema Conformance Report

Version 1.5 – for DMR Batch

Issuance Date: March 7, 2008

Prepared by:
United States Environmental Protection Agency
Office of Enforcement and Compliance Assurance
1200 Pennsylvania Avenue, NW
Washington, DC 20460

Environmental Information eXchange Network

Version 1.5

Docment Status

Title: Integrated Compliance Information System – National Pollutant Discharge Elimination System (ICIS-NPDES) DMR Schema Conformance Package

Author: U.S. EPA, OECA, OC, ETDD, DSIMB

Subject: ICIS-NPDES DMR schema for batch submittal

Description: Version 1.5 of the ICIS-NPDES schema, specifically those schema related to Discharge Monitoring Reports (DMRs).

Publisher: U.S. EPA, OECA, OC, ETDD, DSIMB.

Contributors: DSIMB, ICIS Batch DMR IPT.

Date: March 7, 2008

Comments: Send comments to Alison Kittle, kittle.alison@epa.gov

Comment Period: March 10, 2008 through May 1, 2008

Forum: Pre-development documents are currently posted on the Exchange Network as ICIS-NPDES Version 1.0. Newer version of documents are currently posted on an electronic library called eShare and Version 1.4g of the schema have been posted on CDX at http://www.exchangenetwork.net/schema/icis/1 for pilot testing since February 2008.

Type: Report.

Sources: IDEF XML schemas; version 1 of EPA's XML Design Rules and Convention; EPA data element standards and XML tag data standards approved as of June, 2006.

Changes: Version 1.0 was submitted for approval on March 25, 2005 and received approval July 2005. Version 1.5 is the production release that has been successfully pilot tested for batch Discharge Monitoring Report (DMR) submissions by Illinois and has been approved for submission to the TRG by the ICIS Batch IPT.

Coverage: All DMR related data fields within ICIS-NPDES.

Rights: Held by EPA.

Support: CDX node and web form access and procedures to be supported by CDX Help Desk staff; all other support to be provided by ICIS User Support staff.

Implementation: To replace IDEF implementation of DMR data for selected states only.

Data Flow: To replace the IDEF data flow of DMR data for selected states only.

Endorsement: To be determined.

Stability: The ICIS-NPDES Batch DMR Functionality has undergone three rounds of User Validation Testing followed by one round of User Acceptance Testing. The round of User Acceptance Testing uncountered 1 defect in the ability of CDX to utilize multiple name/value pairs for sending multiple e-mail notifications to users. No other schema defects are outstanding.

Document Contents: This submission package contains the Schema Conformance Report that provides information beneficial to the TRG to perform a review of the ICIS-NPDES schemas, specifically those related to Discharge Monitoring Report (DMR) submissions. It is structured as follows:

- Introduction – a description of the ICIS-NPDES system.
- Methodology – the approach used to analyze the schemas for adherence to W3C and EPA XML schema design standards.
- Findings – the results of the schema analysis.
- Recommendations – comments on issues regarding the materials or sources of information used to prepare the schemas or perform the analysis
- Appendix A – a list of ICIS-NPDES schema files by name
- Appendix B – the Summary Results Matrix
- Appendix C – the Schema Design Tool Reports
- Appendix D – the Data Standards Conformance Matrix
- Appendix E – the results of Shared Schema Component evaluation for ICIS-NPDES

All required documents and two optional documents listed in the Exchange Network Flow Documentation Checklist as shown below are being submitted with this package separately:

Exchange Network Document	ICIS-NPDES Document Name	Date Drafted	Date Finalized	Comments
XML Schema	ICIS_*_v1.5.xsd, index.pdf	3/15/05	3/7/08	Initial release approved by TRG in July 2005. Production release to focus on DMR related schema successfully pilot tested and fully approved by ICIS Batch IPT members.
Schema Conformance Report	ICIS Schema Review Conformance Report 3-7-08.pdf	3/25/05	3/7/08	
Data Exchange Template	ICIS-NPDES Data Exchange Template Version 1.5.pdf	10/24/05	3/7/08	No defined template was available when this document was drafted. Template from flows posted on the Exchange Network in mid 2006 was used instead.
Flow Configuration	ICIS-NPDES XML Schema	6/22/07	1/31/08	No defined template was

Exchange Network Document	ICIS-NPDES Document Name	Date Drafted	Date Finalized	Comments
Document	Users Guide - Version 1.5.pdf			available when this document was drafted. Template from flows posted on the Exchange Network in mid 2006 was used instead.
Example XML Instance Document	ICIS-NPDES Example XML Instance Document - Version 1.5.pdf	7/14/06	3/7/08	No defined template was available when this document was drafted or posted on the Exchange Network in mid 2006. Format was created by DSIMB instead.
Change Control Spreadsheet	ICIS-NPDES Batch Change Control Log .pdf	8/30/07	3/7/08	No defined template was available when this document was drafted or posted on the Exchange Network in mid 2006. Format was created by DSIMB instead.
XML Schema User's Guide	ICIS-NPDES XML Schema Users Guide - Version 1.5.pdf	2/9/06	3/7/08	No defined template was available when this document was drafted. Template from flows posted on the Exchange Network in mid 2006 was used instead.
Model Trading Partner Agreement	Not Applicable	N/A	N/A	TPA is not needed for State flows into ICIS-NPDES.
Additional Flow Tools and/or Documentation	ICIS-NPDES XML Schema Documentation - Version 1.5.pdf	3/3/08	3/7/08	Schema mapping in its own document due to file size. No defined template was available when this document was drafted or posted on the Exchange Network in mid 2006. Format was created by DSIMB instead.

ICIS-NPDES Schema Conformance Report

1.1.1 Flow Documentation Status and Contact Information

Flow Name: Integrated Compliance Information System – National Pollutant Discharge Elimination System (ICIS-NPDES)

Schemas/Versions included in Conformance Report: Version 1.5 of the ICIS-NPDES Data Flow – specifically the schema referenced by the flowing of Discharge Monitoring Report data into the ICIS-NPDES system.

Conformance Report Author: Alison Kittle - OECA, OC, ETDD, DSIMB
Contact Information: kittle.alison@epa.gov

Schema Developer: Alison Kittle - OECA, OC, ETDD, DSIMB
Contact Information: kittle.alison@epa.gov

Flow Owner or Other Point of Contact for Flow Documentation Package: Glendora Spinelli - OECA, OC, ETDD, DSIMB
Contact Information: spinelli.glendora@epa.gov

Date Flow Documentation Package Submitted: March 7, 2008

Introduction

The Integrated Compliance Information System – National Pollutant Discharge Elimination System (ICIS–NPDES) is being enhanced to support an integrated data flow to process electronic batch submissions using eXtensible Markup Language (XML) technology. The Central Data Exchange (CDX) is the point of entry on the Environmental Information Exchange Network (Exchange Network) for environmental data submissions to the Environmental Protection Agency (EPA).

Authorized states, tribes, and EPA regional users submit National Pollutant Discharge Elimination System (NPDES) data via batch to ICIS–NPDES. They compose their transactions into predefined XML formatted files contained in a zip archive file and submit them to ICIS–NPDES through EPA's Central Data Exchange (CDX). Upon receipt, CDX performs important functions on batch files such as validating the submitted data against approved XML schemas, scanning for viruses, archiving all XML files, and authenticating the submitters prior to making the XML files available for processing. CDX provides a Web services interface for distributing files to ICIS–NPDES for processing.

A Web service is deployed in the ICIS–NPDES environment to receive XML files from CDX. ICIS–NPDES is responsible for receiving and extracting data out of the XML files or "parsing" the data, sequencing the transactions, and processing the transactions against the ICIS–NPDES service tier. For any transactions that are not successfully processed, detailed business-rule based errors will be generated. Finally, ICIS–NPDES records the batch processing results and sends the processing status back to CDX.

State users currently update their NPDES data in PCS electronically with ASCII file uploads onto EPA's IBM mainframe or with XML instance file transfers through the Exchange Network's IDEF Data Flow. ICIS-NPDES is being designed to allow users to electronically update data with XML instance file transfers through a new Exchange Network data flow. The first files to be transferred electronically to

ICIS-NPDES are Discharge Monitoring Reports (DMRs) that will be in a format more compatible with newer EPA data and XML standards than PCS batch or the IDEF Data Flow.

The Data Sharing Information Management Branch (DSIMB) of EPA's Office of Environmental Compliance Assistance (OECA) developed 69 schemas and 742 distinct elements to be used to identify, process and validate the submission of XML instance documents from authorized State users. **An earlier version of the ICIS-NPDES schema was submitted to the TRG for review as version 1.0 on March 15, 2005 and approved in July 2005 before ICIS-NPDES Batch development and testing had begun.** Since then, Exchange Network flows are required to undergo a formal conformance review by the TRG after an IPT has reviewed flow documentation and schema have been tested. **Development and User Acceptance Testing for flowing DMR data into the ICIS-NPDES system is complete and unanimous approval of the schema and associated docuementation has been given by members of the ICIS Batch IPT. The intent of this schema chema conformance review request is to focus primarily on the ICIS-NPDES schema related to DMR data.**

The PCS Modernization Executive Council agreed that the ICIS-NPDES schemas needed only to adhere to EPA data standards and guidelines that were in place as of January 1, 2004, and Kim Nelson concurred with this decision in a subsequent meeting with OECA. DSIMB followed these standards and guidelines as much as possible for the initial design and creation of the ICIS-NPDES schema but reserved the right to update the schema with newer standards only as time and budget permitted. The ICIS-NPDES schema match EPA's schema development standards and guidelines as follows:

- all elements are declared as global with the exception of one complex type header element and one complex type element in the master schema,
- all element names are in camel-case with no underscores or spaces,
- all elements in the data standards use the same name and characteristics as EPA xml tag naming convention standards as of June 2006, with the exception of the CityCode and various code elements,
- the header schema contains all of the elements recommended by the Exchange Network for header development except the headers are designed to be embedded within an XML instance document instead of its own separate XML instance document,
- all schemas include a version number within the schema and as part of the schema name, and
- templates for the Flow Configuration Document, Data Exchange Template, and Example XML Instance documents were not available when the ICIS-NPDES Batch documents were drafted. Instead, documentation from flows posted on the Exchange Network in late 2006 – early 2007 were used where found.

The ICIS-NPDES schemas do not match EPA's schema development standards and guidelines as follows:

- The core reference model was in draft mode when design on the ICIS-NPDES schema was nearly finished and changed significantly with the initial release. DSIMB performed an evaluation of the shared schema components in August 2006 and determined it would take 6 months of full time work to modify the existing schema to incorporate them. DSIMB opted not to incorporate shared schema components to avoid a significantly delay in the ICIS-NPDES Batch processing code development. The results of this evaluation are presented in Appendix E of this document.
- One record in ICIS-NPDES has the potential to be added, changed and deleted within the same schema, and one data family may allow a cascade delete while another does not. Rather than create two different elements, DSIMB created one local TransactionType element in various schemas that is substituted with one of two global elements (TransactionCDNType, TransactionCNXType) having enumeration lists.

- The CountyCode element is a three character field (FIPS county) in the data standards. The ICIS-NPDES database stores it as a five character field (FIPS state + FIPS county). The element for this ICIS-NPDES element must match the ICIS-NPDES database.
- The data standard for XML tags lists name and characteristics for code descriptions. DSIMB has told the ICIS-NPDES users since the design phase that codes will be submitted instead of code descriptions. Where ICIS-NPDES schemas have codes that match the data standard for their description, DSIMB followed the same nomenclature but substituted the word "Code" for "Name" or "Description" as the element name.
- Elements with recurring, complex content are referenced more than once in schema where multiple contact types are allowed. This is prevalent throughout most of our schema and requires much effort to change.
- While multiple recurring elements are within their own container, single ones are not.
- Component schema files define elements. This is prevalent throughout most of our schema and requires much effort to change.
- These schema do not include schema construct documentation. Including comments for each element would create such large schema that XMLSpy would not be able to load our ICIS schema.

Methodology

DSIMB used methodology stated below to prepare and analyze the ICIS-NPDES schema for the TRG review process of the initial 1.0 version of the ICIS-NPDES schema. The design of this methodology was based upon Step B in the December 1, 2003 version of the Schema Review Process for Schema Developers. The results of these steps are documented in the March 25, 2005 report submitted to the TRG.

- verify the rules stated in version 1 of the XML Design Rules and Convention and the XML Schema Design Rules and Conventions – Version 1.1 were applied to each schema where possible by comparing the schemas against the document visually,
- use XMLSpy Professional version 2005 sp1 to create schemas and perform validation and well-formedness checks,
- verify the names of applicable schema elements match EPA data element standards and XML tag data standards approved as of June 2006 by comparing each element of the schema visually,

Because this review focuses on the flow of DMR data into ICIS-NPDES, the steps above were not performed for this review request. **Instead, the methodology followed focused on preparing the DMR schema in Version 1.5 by using the steps outlined in Section 4 of the Exchange Network Schema Conformance Report Preparation and Review Process – Version 2.0, specifically:**

- use the W3C Schema Validator tool to perform W3C compliance
- use XMLSpy 2006 Professional Edition to create schemas and perform validation and well-formedness checks,
- use the Schema Checker Tool located on the FRS section of the Exchange Network site on March 16, 2005 to process each schema and check the results for errors, and
- evaluate the integration of shared schema components.

Findings

The findings of the methodology used on Version 1.0 of the ICIS-NPDES schemas utilitizing the steps in the Schema Review Process for Schema Developers document was previously reported in the Schema Conformance Report submitted to the TRG dated March 25, 2005 and will not be repeated in this report. **The focus of this review request is on Version 1.5 of the ICIS-NPDES schema – specifically the DMR related schema. Because of this the methodology described in steps in Section 4 of the Exchange Network Schema Conformance Report Preparation and Review Process, Version 2.0 was performed primarily on DMR related schema. The findings of this methodology are:**

Step A.

- Tried to validate the pilot tested ICIS-NDPES schema (version 1.4g) posted on CDX at http://www.exchangenetwork.net/schema/icis/1 but W3C's XSV tool does not recognize the ICIS namespace at CDX and returns an error of "Error: can't retrieve "http://www.exchangenetwork.net/schema/icis/1/index.xsd": 404 Not Found" when a schema name such as "http://www.exchangenetwork.net/schema/icis/1/index.xsd" is entered. Also tried to view the schema files on CDX using the URL of http://www.exchangenetwork.net/schema but ICIS is not listed as one of the child directories. These schema are not posted anywhere else on the Internet and neither OECA nor the ICIS-NPDES contractor have a public site to post them without ID and password protection. This step was skipped.
- All ICIS-NPDES schemas passed validation checks by XMLSpy 2006 Professional Edition
- All ICIS-NPDES schemas passed well-formedness checks by XMLSpy 2006 Professional Edition 2006 Professional Edition

Step B.

- Used FRS' Schema Design Tool to check for errors in DMR related schema only and documented findings.
- Compared XML Schema Design Rules and Conventions (DRC) Version 1.1 against all ICIS schema and documented the findings.

Step C.

- Performed an evaluation of the shared schema components by comparing the components posted on the Exchange Network in July 2006 against version 1.4e of the ICIS-NPDES schema. Most of the ICIS-NPDES schema were candidates for shared schema components but several issues arose. Refer to Appendix E for information on this evaluation and its findings.

1.1.2 W3C Conformance and Validation

W3C's XSV Tool Output:

[ ] yes [x] no Output pasted in the last section of the Conformance Report
[ ] yes [x] no Zero errors identified by XSV Tool

Explanation of Warnings Listed in XSV Tool Output:

Warning	Explanation
XSV Tool not used	**The URL on Exchange Network for ICIS Schema is published on the Exchange Network as `http://www.exchangenetwork.net/schema/icis/1` but is not publicly published for this tool to be able**

	to access them. These schema files are not posted anywhere else on the Internet.

Schema and Instance Document Validation:
Names of XML parser(s) intended for use in conjunction with the flow and development tool(s) used to validate the schema and instance documents:

XMLSpy 2006 Professional Edition
Stylus Studio 2008 XML Enterprise
CDX schema validation tool at http://tools.epacdxnode.net/

[x] yes [ ] no All schema files validate using all parsers and tools listed above
[x] yes [ ] no All sample instance documents validate using all parsers and tools listed above
[x] yes [ ] no All sample instance documents validate using the CDX validator service

1.1.3 Design Rules and Conventions Conformance

The PCS Modernization Executive Council agreed that the ICIS-NPDES schemas needed only to adhere to EPA data standards and guidelines that were in place as of January 1, 2004, and Kim Nelson concurred with this decision in a subsequent meeting with OECA. DSIMB followed these standards and guidelines as much as possible for the design and creation of the ICIS-NPDES schema but reserved the right to update the schema with newer standards only as time and budget permitted.

Explanation of DRC Violations Identified:

DRC Rule ID	Schema Filenames	Explanation
SD3-1	ICIS_Header	One record in ICIS-NPDES has the potential to be added, changed and deleted within the same schema, and one data family may allow a cascade delete while another does not. Rather than create two different elements, DSIMB created one local TransactionType element in various schemas that is substituted with one of two global elements (TransactionCDNType, TransactionCNXType) having enumeration lists
GD1-A, B, C,	Most Message Schema	Too expensive/time consuming to implement after the fact
SD5-28	All Schema	Too expensive/time consuming to implement after the fact
Local Shared Schema	Common Schema	ICIS_Common schema was named to be consistent with similar IDEF precursor. This naming convention occurred after

		the initial ICIS schema were approved. Version 1.5 has already been tested and is ready to post. It is too late to rename this file and do proper testing but DSIMB will rename the file in the next version to be consistent with standards.

1.1.4

1.1.5 Shared Schema Components Conformance

High Level of SSC Integration:

Element Name	Schema Path
No ICIS schema	

Medium Level of SSC Integration:

Element Name	Complex SSC Element or Data Type	Derived By
No ICIS schema		

Low Level of SSC Integration:

Element Name	Simple SSC Element or Data Type
No ICIS schema	

Explanation for Not Integrating Available SSCs:

Schema Name	Element or Type	SSC Element or Type	Explanation
All ICIS schema			**DSIMB performed an analysis of the shared schema components in September 2006 and determined it would take 6 months of full time work to modify the existing schema to incorporate them. DSIMB opted not to incorporate shared schema components to avoid a significantly delay in the ICIS-NPDES Batch processing code development.**

Candidates for New SSCs:

Schema Name	Element or Type Name	CRM data block

Recommendations

1.1.6 Recommendations

1. XML Spy and Stylus Studio claim to detect if schema are fully compatible with the final May 2001 W3C schema standard. Consider amending the requirement to use either the W3C schema compliance check or a W3C compliant schema validator.
2. The link to the Schema Design Rules on page 13 of the Exchange Network Schema Conformance Report Preparation and Review Process returns a page error.
3. A suggestion regarding the rules in the XML Schema Design Rules and Conventions, Version 1.1 document – we have a large amount of schema files and memory limitations were encountered when using XML Spy to open the Root Schema. Rules within that add extra lines to our schema such as those for multiple references to global complex elements that add extra lines to schema, schema documentation for each element, referencing single recurring elements nested within a container, and the schemaVersion attribute simply exacerbate this problem. When the next revision of this document occurs please include sizing of the collective schema as a factor in your decisions.
4. More thought needs to be given to handling shared schema components. While performing our analysis we discovered several SSC elements with names that did not match the tag naming standards. If we had incorporated SSCs into our flow and were fully operational then someone had discovered this after the fact and an attempt was made to fix them, all affected parties will have to find time, resources and money to implement what appeared to be one small change at the SSC level. For a small flow like TRI this change can be implemented easily. But a large flow like ICIS will require 25+ state submitters to make changes plus determine a date that all can be ready to implement and test the change on their end. Not all have the staff and money on hand to respond to changes quickly, thus even one SSC change has the potential to become an expensive and/or delayed at the flow level the larger the flow is.

W3C's XSV Tool Output

Tried to validate the pilot tested ICIS-NDPES schema (version 1.4g) posted on CDX at http://www.exchangenetwork.net/schema/icis/1 but W3C's XSV tool does not recognize the ICIS namespace at CDX and returns an error of "Error: can't retrieve "http://www.exchangenetwork.net/schema/icis/1/index.xsd": 404 Not Found" when a schema name such as "http://www.exchangenetwork.net/schema/icis/1/index.xsd" is entered. Also tried to view the schema files on CDX using the URL of http://www.exchangenetwork.net/schema but ICIS is not listed as one of the child directories. These schema are not posted anywhere else on

the Internet and neither OECA nor the ICIS-NPDES contractor have a public site to post them without ID and password protection. This step was skipped.

Appendix A – List of ICIS-NPDES Schema

ICIS-NPDES schema were previously reviewed and accepted by the TRG in July 2005. Although all proposed ICIS-NPDES schema are being submitted with this review request, only the schema related to DMRs have been tested and approved by the ICIS Batch IPT for this review. The DMR related schema files are listed in bold text below.

Schema File Name	Purpose
index.xsd	**Default File**
ICIS _v1.5.xsd	**Root Schema**
ICIS_Address _v1.5.xsd	Component Schema
ICIS_Basic_Permit _v1.5.xsd	Message Schema
ICIS_Biosolids_Permit _v1.5.xsd	Message Schema
ICIS_Biosolids_Program_Report _v1.5.xsd	Message Schema
ICIS_Biosolids _v1.5.xsd	Component Schema
ICIS_CAFO_Annual_Report _v1.5.xsd	Message Schema
ICIS_CAFO_Inspection _v1.5.xsd	Message Schema
ICIS_CAFO_Permit _v1.5.xsd	Message Schema
ICIS_CAFO _v1.5.xsd	Component Schema
ICIS_Common _v1.5.xsd	**Local Shared Schema**
ICIS_Compliance_Monitoring_Linkage _v1.5.xsd	Message Schema
ICIS_Compliance_Monitoring _v1.5.xsd	Message Schema
ICIS_Compliance_Schedule _v1.5.xsd	Message Schema
ICIS_Contact _v1.5.xsd	Component Schema
ICIS_CSO_Event_Report _v1.5.xsd	Message Schema
ICIS_CSO_Inspection _v1.5.xsd	Message Schema
ICIS_CSO_Permit _v1.5.xsd	Message Schema
ICIS_CSO _v1.5.xsd	Component Schema
ICIS_Discharge_Monitoring_Report _v1.5.xsd	**Message Schema**
ICIS_Discharge_Monitoring_Report_Violation _v1.5.xsd	Message Schema
ICIS_DMR_Program_Report_Linkage _v1.5.xsd	Message Schema
ICIS_Effluent_Trade_Partner _v1.5.xsd	Message Schema
ICIS_Enforcement_Action_Keys _v1.5.xsd	Message Schema
ICIS_Facility _v1.5.xsd	Message Schema
ICIS_Formal_Enforcement_Action _v1.5.xsd	Message Schema
ICIS_General_Permit_Covered_Facility _v1.5.xsd	Message Schema
ICIS_Geographic_Coordinates _v1.5.xsd	Component Schema
ICIS_Header _v1.5.xsd	**Component Schema**
ICIS_Informal_Enforcement_Action _v1.5.xsd	Message Schema
ICIS_Key_Elements _v1.5.xsd	**Component Schema**
ICIS_Limit_Set _v1.5.xsd	Message Schema
ICIS_Limits _v1.5.xsd	Message Schema
ICIS_Local_Limits_Program_Report _v1.5.xsd	Message Schema
ICIS_Master_General_Permit _v1.5.xsd	Message Schema
ICIS_Narrative_Condition _v1.5.xsd	Message Schema
ICIS_Permit_Schedule _v1.5.xsd	Message Schema
ICIS_Permit_Tracking_Event _v1.5.xsd	Message Schema
ICIS_Permit _v1.5.xsd	Component Schema
ICIS_Permitted_Feature _v1.5.xsd	Message Schema
ICIS_POTW_Permit _v1.5.xsd	Message Schema
ICIS_Pretreatment_Inspection _v1.5.xsd	Message Schema

ICIS_Pretreatment_Permit _v1.5.xsd	Message Schema
ICIS_Pretreatment_Program_Summary_Report _v1.5.xsd	Message Schema
ICIS_Pretreatment _v1.5.xsd	Component Schema
ICIS_RNC_Detection_Resolution _v1.5.xsd	Component Schema
ICIS_Satellite_Collection_Systems _v1.5.xsd	Component Schema
ICIS_Schedule_Event _v1.5.xsd	Component Schema
ICIS_Schedule_Event_Violation _v1.5.xsd	Message Schema
ICIS_SIC_NAICS _v1.5.xsd	Component Schema
ICIS_Single_Event_Violation _v1.5.xsd	Message Schema
ICIS_SSO_Annual_Report _v1.5.xsd	Message Schema
ICIS_SSO_Event_Report _v1.5.xsd	Message Schema
ICIS_SSO_Inspection _v1.5.xsd	Message Schema
ICIS_SSO_Monthly_Event_Report _v1.5.xsd	Message Schema
ICIS_SSO _v1.5.xsd	Component Schema
ICIS_Status _v1.5.xsd	Component Schema
ICIS_Stays _v1.5.xsd	Component Schema
ICIS_Sub_Activity _v1.5.xsd	Message Schema
ICIS_SW_Construction _v1.5.xsd	Message Schema
ICIS_SW_Event_Report _v1.5.xsd	Message Schema
ICIS_SW_Industrial_Permit _v1.5.xsd	Message Schema
ICIS_SW_Inspection _v1.5.xsd	Message Schema
ICIS_SW_MS4_Large_Permit _v1.5.xsd	Message Schema
ICIS_SW_MS4_Program_Report _v1.5.xsd	Message Schema
ICIS_SW_MS4_Small_Permit _v1.5.xsd	Message Schema
ICIS_SW _v1.5.xsd	Component Schema
ICIS_Unpermitted_Facility_v1.5.xsd	Message Schema

Appendix B – Summary Results Matrix

ICIS-NPDES schema were previously reviewed and accepted by the TRG in July 2005. Although all proposed ICIS-NPDES schema are being submitted with this review request, only the schema related to DMRs have been tested and approved by the ICIS Batch IPT for this review. The DMR related schema files are listed in the table below.

Schema Design Tool Violation	Applicable ICIS-NPDES Schemas	Example of Element(s) with the Violation	Justification for Deviation
[SD2-1] Data-centric schemas MUST usesimple datatypes to the maximum extent possible	ICIS_Discharge_Monitoring_Report	<xsd:group name="FormNODIGroup"> <xsd:sequence> <xsd:element ref="icis:DMRNoDischargeIndicator" minOccurs="0"/> <xsd:element ref="icis:DMRNoDischargeReceivedDate" minOccurs="0"/> </xsd:sequence> </xsd:group>	Elements with these violations are in model groups and are thus not in violation per rule in place when these schema were originally developed "[SD3-28] Data-centric schemas MAY use model groups."
[SD3-1] Data-centric schemas MUST use global elements.	ICIS	<xsd:complexType name="PayloadData"> <xsd:choice> … <xsd:element name="DischargeMonitoringReportData" type="icis:DischargeMonitoringReportData" maxOccurs="unbounded"/> … <xsd:attribute name="Operation" type="icis:OperationType" use="required"/> </xsd:complexType>	This is the main schema that includes calls to the rest of the ICIS schema. In order to use the Payload attribute, elements were established for each different anticipated submission XML instance document.
[SD5-19] The version number MUST include both a major version component and a minor version component.	ICIS, ICIS_Common, ICIS_Discharge_Monitoring_Report, ICIS_Header, ICIS_Key_Elements, index		This rule was not in effect when the ICIS schema were first developed.
[SD2-3] Data-centric schemas that employ complex datatypes MUST define the complex datatypes as global.	ICIS	<xsd:complexType name="PayloadData"> <xsd:choice> … <xsd:element name="DischargeMonitoringReportData" type="icis:DischargeMonitoringReportData" maxOccurs="unbounded"/> … <xsd:attribute name="Operation" type="icis:OperationType" use="required"/> </xsd:complexType>	This is the Root schema that includes calls to the rest of the ICIS schema. In order to use the Payload attribute, elements were established for each different anticipated submission XML instance document.
[SD3-9] Data-centric schemas MUST NOT use attributes in place of data elements.	ICIS	<xsd:complexType name="PayloadData"> … <xsd:attribute name="Operation" type="icis:OperationType" use="required"/> </xsd:complexType>	This attribute is in the Exchange Network Header (ExchangeNetworkDocument.xsd v1.0 as of 3/17/2005).
[SD5-34]	index		This is the Default file that simply

Schema Design Tool Violation	Applicable ICIS-NPDES Schemas	Example of Element(s) with the Violation	Justification for Deviation
Schema Header Documentation is required.			points to the most current version of the ICIS schema and should not require documentation.

Appendix C – Schema Design Tool Results

ICIS-NPDES schema were previously reviewed and accepted by the TRG in July 2005. Although all proposed ICIS-NPDES schema are being submitted with this review request, only the schema related to DMRs have been tested and approved by the ICIS Batch IPT for this review. The results of the schema design tool analysis on DMR related schema are given below.

Report

Violations for File : ICIS_Common_v1.5.xsd			
Thu Mar 06 16:38:22 EST 2008			
1	[schema]	[SD5-19] The version number MUST include both a major version component and a minor version component.	Line Number : 3
Total Number of Violations = 1			

Report

Violations for File : ICIS_Discharge_Monitoring_Report_v1.5.xsd			
Thu Mar 06 16:42:03 EST 2008			
1	[schema]	[SD5-19] The version number MUST include both a major version component and a minor version component.	Line Number : 3
2	[element name=icis:DMRNoDischargeIndicator]	[SD2-1] Data-centric schemas MUST usesimple datatypes to the maximum extent possible.	Line Number : 164
3	[element name=icis:DMRNoDischargeReceivedDate]	[SD2-1] Data-centric schemas MUST usesimple datatypes to the maximum extent possible.	Line Number : 165
4	[element name=icis:ClassAAlternativeUsed]	[SD2-1] Data-centric schemas MUST usesimple datatypes to the maximum extent possible.	Line Number : 170
5	[element name=icis:ClassAAlternativesText]	[SD2-1] Data-centric schemas MUST usesimple datatypes to the maximum extent possible.	Line Number : 171
6	[element name=icis:ClassBAlternativeUsed]	[SD2-1] Data-centric schemas MUST usesimple datatypes to the maximum extent possible.	Line Number : 176
7	[element name=icis:ClassBAlternativesText]	[SD2-1] Data-centric schemas MUST usesimple datatypes to the maximum extent possible.	Line Number : 177
8	[element name=icis:VARAlternativeUsed]	[SD2-1] Data-centric schemas MUST usesimple datatypes to the maximum extent possible.	Line Number : 182
9	[element name=icis:VARAlternativesText]	[SD2-1] Data-centric schemas MUST usesimple datatypes to the maximum extent possible.	Line Number : 183
Total Number of Violations = 9			

Report

Violations for File : ICIS_Header_v1.5.xsd			
Thu Mar 06 16:48:15 EST 2008			
1	[schema]	[SD5-19] The version number MUST include both a major version component and a minor version component.	Line Number : 3
Total Number of Violations = 1			

Report

Violations for File : ICIS_Key_Elements_v1.5.xsd			
Thu Mar 06 16:48:35 EST 2008			
1	[schema]	[SD5-19] The version number MUST include both a major version component and a minor version component.	Line Number : 3

Total Number of Violations = 1

Report

Violations for File : ICIS_v1.5.xsd			
Thu Mar 06 16:49:23 EST 2008			
1	[schema]	[SD5-19] The version number MUST include both a major version component and a minor version component.	Line Number : 2
2	[element name=Document]	[SD2-1] Data-centric schemas MUST usesimple datatypes to the maximum extent possible.	Line Number : 67
3	[complexType name=]	[SD2-3] Data-centric schemas that employ complex datatypes MUST define the complex datatypes as global.	Line Number : 68
4	[element name=Header]	[SD3-1] Data-centric schemas MUST use global elements.	Line Number : 70
5	[element name=Payload]	[SD3-1] Data-centric schemas MUST use global elements.	Line Number : 71
6	[element name=BasicPermitData]	[SD3-1] Data-centric schemas MUST use global elements.	Line Number : 77
7	[element name=BiosolidsPermitData]	[SD3-1] Data-centric schemas MUST use global elements.	Line Number : 78
8	[element name=BiosolidsProgramReportData]	[SD3-1] Data-centric schemas MUST use global elements.	Line Number : 79
9	[element name=CAFOAnnualReportData]	[SD3-1] Data-centric schemas MUST use global elements.	Line Number : 80
10	[element name=CAFOInspectionData]	[SD3-1] Data-centric schemas MUST use global elements.	Line Number : 81
11	[element name=CAFOPermitData]	[SD3-1] Data-centric schemas MUST use global elements.	Line Number : 82
12	[element name=ComplianceMonitoringLinkageData]	[SD3-1] Data-centric schemas MUST use global elements.	Line Number : 83
13	[element name=ComplianceMonitoringData]	[SD3-1] Data-centric schemas MUST use global elements.	Line Number : 84
14	[element name=ComplianceScheduleData]	[SD3-1] Data-centric schemas MUST use global elements.	Line Number : 85
15	[element name=CSOEventReportData]	[SD3-1] Data-centric schemas MUST use global elements.	Line Number : 86
16	[element name=CSOInspectionData]	[SD3-1] Data-centric schemas MUST use global elements.	Line Number : 87
17	[element name=CSOPermitData]	[SD3-1] Data-centric schemas MUST use global elements.	Line Number : 88
18	[element name=DischargeMonitoringReportData]	[SD3-1] Data-centric schemas MUST use global elements.	Line Number : 89
19	[element name=DMRViolationData]	[SD3-1] Data-centric schemas MUST use global elements.	Line Number : 90
20	[element name=DMRProgramReportLinkageData]	[SD3-1] Data-centric schemas MUST use global elements.	Line Number : 91
21	[element name=EffluentTradePartnerData]	[SD3-1] Data-centric schemas MUST use global elements.	Line Number : 92
22	[element name=EnforcementActionViolationKeyData]	[SD3-1] Data-centric schemas MUST use global elements.	Line Number : 93
23	[element name=FacilityData]	[SD3-1] Data-centric schemas MUST use global elements.	Line Number : 94
24	[element name=FormalEnforcementActionData]	[SD3-1] Data-centric schemas MUST use global elements.	Line Number : 95
25	[element name=GeneralPermitData]	[SD3-1] Data-centric schemas MUST use global elements.	Line Number : 96

26	[element name=InformalEnforcementActionData]	[SD3-1] Data-centric schemas MUST use global elements.	Line Number : 97
27	[element name=LimitSetData]	[SD3-1] Data-centric schemas MUST use global elements.	Line Number : 98
28	[element name=LimitsData]	[SD3-1] Data-centric schemas MUST use global elements.	Line Number : 99
29	[element name=LocalLimitsProgramReportData]	[SD3-1] Data-centric schemas MUST use global elements.	Line Number : 100
30	[element name=MasterGeneralPermitData]	[SD3-1] Data-centric schemas MUST use global elements.	Line Number : 101
31	[element name=NarrativeConditionData]	[SD3-1] Data-centric schemas MUST use global elements.	Line Number : 102
32	[element name=PermitScheduleData]	[SD3-1] Data-centric schemas MUST use global elements.	Line Number : 103
33	[element name=PermittedFeatureData]	[SD3-1] Data-centric schemas MUST use global elements.	Line Number : 104
34	[element name=PermitTrackingEventData]	[SD3-1] Data-centric schemas MUST use global elements.	Line Number : 105
35	[element name=PretreatmentInspectionData]	[SD3-1] Data-centric schemas MUST use global elements.	Line Number : 106
36	[element name=PretreatmentPermitData]	[SD3-1] Data-centric schemas MUST use global elements.	Line Number : 107
37	[element name=PretreatmentPerformanceSummaryData]	[SD3-1] Data-centric schemas MUST use global elements.	Line Number : 108
38	[element name=ScheduleEventViolationData]	[SD3-1] Data-centric schemas MUST use global elements.	Line Number : 109
39	[element name=SingleEventViolationData]	[SD3-1] Data-centric schemas MUST use global elements.	Line Number : 110
40	[element name=SSOAnnualReportData]	[SD3-1] Data-centric schemas MUST use global elements.	Line Number : 111
41	[element name=SSOEventReportData]	[SD3-1] Data-centric schemas MUST use global elements.	Line Number : 112
42	[element name=SSOInspectionData]	[SD3-1] Data-centric schemas MUST use global elements.	Line Number : 113
43	[element name=SSOMonthlyEventReportData]	[SD3-1] Data-centric schemas MUST use global elements.	Line Number : 114
44	[element name=POTWPermitData]	[SD3-1] Data-centric schemas MUST use global elements.	Line Number : 115
45	[element name=SubActivityData]	[SD3-1] Data-centric schemas MUST use global elements.	Line Number : 116
46	[element name=SWConstructionPermitData]	[SD3-1] Data-centric schemas MUST use global elements.	Line Number : 117
47	[element name=SWEventReportData]	[SD3-1] Data-centric schemas MUST use global elements.	Line Number : 118
48	[element name=SWIndustrialPermitData]	[SD3-1] Data-centric schemas MUST use global elements.	Line Number : 119
49	[element name=SWInspectionData]	[SD3-1] Data-centric schemas MUST use global elements.	Line Number : 120
50	[element name=SWMS4LargePermitData]	[SD3-1] Data-centric schemas MUST use global elements.	Line Number : 121
51	[element name=SWMS4ProgramReportData]	[SD3-1] Data-centric schemas MUST use global elements.	Line Number : 122
52	[element name=SWMS4SmallPermitData]	[SD3-1] Data-centric schemas MUST use global elements.	Line Number : 123
53	[element name=UnpermittedFacilityData]	[SD3-1] Data-centric schemas MUST use global elements.	Line Number : 124

54	[attribute name=Operation]	[SD3-9] Data-centric schemas MUST NOT use attributes in place of data elements.	Line Number : 126
Total Number of Violations = 54			

Report

Violations for File : index.xsd			
Thu Mar 06 16:50:00 EST 2008			
1		[SD5-20] Data-centric schemas SHOULD include a version number (1) in their filename.	
2	[schema]	[SD5-19] The version number MUST include both a major version component and a minor version component.	Line Number : 3
3		[SD5-34] Schema Header Documentation is required.	
Total Number of Violations = 3			

Appendix D – Data Standards Conformance Matrix

ICIS-NPDES schema were previously reviewed and accepted by the TRG in July 2005. Although all proposed ICIS-NPDES schema are being submitted with this review request, only the schema related to DMRs have been tested and approved by the ICIS Batch IPT for this review. The results of the data standards conformance performed on DMR related schema are given below.

ICIS Element Name	Type	Max Length	Min Length	Valid Values	EPA Data Standard	Meets EPA Data Standard	Comments on Noncompliance
MonitoringSiteDescriptionCode	Character	3	1	ICIS table of acceptable values	Description	No	EPA element naming standards exist for descriptions. ICIS-NPDES submitters will give codes, not descriptions.
NumericConditionQualifier	Character	3	1	ICIS table of acceptable values	Description	No	EPA element naming standards exist for descriptions. ICIS-NPDES submitters will give codes, not descriptions.
NumericConditionQuantity	Number	8	1	positive or negative integer with floating decimal	Yes	Yes	
PermittedFeatureIdentifier	Character	4	1		Yes	Yes	
ReportingFrequencyCode	Character	3	1	ICIS table of acceptable values	Description	No	EPA element naming standards exist for descriptions. ICIS-NPDES submitters will give codes, not descriptions.

Appendix E – Results of Shared Schema Component Evaluation

Background

- States submitting electronic data to EPA systems through the Central Data Exchange must be in XML format. Each EPA system creates a set of schema files that dictate the exact layout and characteristics of data contained in these XML files.

- When the Central Data Exchange receives an XML file from a State it uses a software package to load EPA system's schema into memory and analyze the XML file contents to ensure the data in the XML is in the correct location and format.

- ICIS schema were originally developed by the ICIS contractor in 2003 through 2004 then reworked by OECA staff to ensure XML data element standards were met. After ICIS went into production, the contractor performed a gap analysis on the schema from November 2006 through January 2007 to ensure the ICIS schema could feed ICIS with the correct data. The ICIS schema are currently in the final stages of completion.

- OEI requested in Fall 2006 that ICIS incorporate the shared schema components (finalized in May 2006) be implemented into the ICIS schema. OECA performed an analysis of incorporating the shared schema components and found the following:

Comparison

1. 49 of the 59 shared schema component files relate to ICIS, and 112 of their data elements have a corresponding field in ICIS

Impact

2. It would take 6 months of full-time work for one person to incorporate the shared schema components into ICIS
3. Using shared schema components will require analyzing each change to ICIS or the shared schema components to determine the impact, and applying, testing and implementing change(s) if necessary
4. Changes to the shared schema components can only be implemented when the affected state needing the longest amount of time is ready
5. The shared schema components are stored separately from the ICIS schema, introducing an extra point of failure into processing of incoming XML files

Justification

6. If an EPA system is adhering to the XML data element and EPA data standards there is no intrinsic value in ICIS using shared schema components:
    a. The names of the elements in shared schema components are supposed to match the XML data element standards but some do not
    b. The enforcement of a rigid XML data layout that is the strength of standardizing schema files adversely affects developed schemas yet is not fully taken advantage of by the shared schema components
    c. Much additional work is necessary when incorporating elements from the shared schema components with generic string and date element characteristics

Shared Schema Component	**XMLs Affected**	**Tags Affected**	**Issues**
SC_Accreditation_v1.0.xsd	N/A	Not applicable to ICIS	N/A
SC_Affiliation_v1.0.xsd	BasicPermitSubmission, GeneralPermitSubmission, BiosolidsPermitSubmission, CAFOInspectionSubmission, CAFOPermitSubmission, FacilitySubmission, PermittedFeatureSubmission, SWEventReportSubmission, SWInspectionSubmission, SWMS4ProgramReportSubmission, SWMS4LargePermitSubmission, SWMS4SmallPermitSubmission, SWMS4ProgramReportSubmission, ComplianceMonitoringSubmission, PretreatmentPermitSubmission	Components are called “AffiliationTypeText” that is 40 characters, “AffiliationStartDate”, “AffiliationEndDate”, “AffiliationStatusText” that is 1 character code. ICIS calls them “AffiliationTypeText” that is 3 character code, “StartDateOfContactAssociation”, “StartDateOfAddressAssociation”, “EndDateOfContactAssociation”, “EndDateOfAddressAssociation”, “StatusOfContactAssociation”, “StatusOfAddressAssociation” that is 1 character code.	4 tags out of 5 SSC tags apply to ICIS and are separated from each other. SSC codes for “AffiliationStatusText” allows A, I or a blank but XML data standards allow A, I, O and P - ICIS allows A, I and an asterisk.
SC_AgencyIdentity_v1.0.xsd	ComplianceMonitoringSubmission, FacilitySubmission	Component is called “AgencyCode” that is any length of characters. ICIS calls it “ComplianceMonitoringAgencyCode” that is 3 character code and “FederalAgencyCode” that is 3 character code.	1 out of 5 SSC tags apply to ICIS. XML tag standard has “**Responsible**AgencyCode” but not “AgencyCode”.
SC_AgencyType_v1.0.xsd	BasicPermitSubmission, MasterGeneralPermitSubmission, GeneralPermitSubmission, ComplianceMonitoringSubmission	Component is called “AgencyTypeCode” that is any length of characters. ICIS calls it “AgencyTypeCode” that is 3 character code and “ComplianceMonitoringAgencyTypeCode” that is 3 character code.	1 out of 3 SSC tags apply to ICIS. XML tag standard has “**Responsible**AgencyTypeCode” but not “AgencyTypeCode”.

SC_ApplicableEnvironmentalCitation_v2.0.xsd	N/A	Not applicable to ICIS	N/A
SC_BiologicalSubstanceIdentity_v2.0.xsd	CAFOAnnualReportSubmission, CAFOInspectionSubmission, CAFOPermitSubmission, DischargeMonitoringReportSubmission	Component is called "BiologicalVernacularName" that is 50 characters. ICIS calls it "AnimalTypeCode" that is 3 character code based, "OtherAnimalTypeName" that is 50 characters, "CropTypesHarvested" that is 3 character code, "CropTypesPlanted" that is 3 character code.	1 out of 26 SSC tags apply to ICIS.
SC_ChemicalSubstanceIdentity_v2.0.xsd	a) LocalLimitsProgramReportSubmission, PretreatmentInspectionSubmission, PretreatmentProgramSummarySubmission, DischargeMonitoringReportSubmission b) DischargeMonitoringReportSubmission, DMRViolationSubmission, EffluentTradePartnerSubmission, EnforcementActionViolationKeySubmission, LimitsSubmission	Component is called "EPAChemicalInternalTrackingNumber" that is 9 characters. ICIS calls it, a) "PollutantCode", "LocalLimitsPollutantCode", "PollutantMetForLandApplication", "RemovalCreditsPollutantCode" that are 4 character codes b) "ParameterCode" that is 5 character code	1 out of 19 SSC tags apply to ICIS.
SC_ComplianceMilestones_v2.0.xsd	SubActivitySubmission	Components are called "ComplianceMilestoneType" (see SC_ComplianceMilestoneType_v2.0.xsd) that is any length of characters, "ComplianceMilestoneScheduledDate", "ComplianceMilestoneCompletedDate". ICIS calls them "SubActivityTypeCode" that is 5 characters, "EnforcementActionPlannedDate", "EnforcementActionDate".	3 out of 8 SSC tags apply to ICIS. "ComplianceMilestoneType" repeats consecutively independent of "ComplianceMilestoneScheduledDate" and "ComplianceMilestoneCompletedDate". One "SubActivityCode" repeats consecutively with "EnforcementActionPlannedDate" and "EnforcementActionDate". XML tag standard does not have "ComplianceMilestoneType" or "ComplianceMilestoneScheduledDate" tags. XML tag standard has "ComplianceMilestonesCompletedDate" tag.
SC_ComplianceMilestoneType_v2.0.xsd	SubActivitySubmission	Components are called "ComplianceMilestoneTypeCode" that is any length of characters and "ComplianceMilestoneCodeListTypeIdentifier" that is any length of characters. ICIS calls it "SubActivityTypeCode" and is 5 characters.	"ComplianceMilestoneTypeCode" is whatever length we give it and "ComplianceMilestoneCodeListTypeIdentifier" is used by us to set up the code list. "SubActivityTypeCode" is validated against an ICIS code table instead of the schema. XML tag

			standard does not have the 2 SCC tags for compliance milestone.
SC_ComplianceSchedule_v2.0.xsd	a) ComplianceScheduleSubmission, ScheduleViolationSubmission b) InformalEnforcementActionSubmission	Components are called "ComplianceScheduleIdentifier" that is any length of characters , "ComplianceScheduleIndicator" that accepts Y or N, "ReturnToComplianceScheduleDate", "ReturnToComplianceActualDate", and "ComplianceScheduleDescriptionText" that is any length of characters. ICIS calls them: a) "ComplianceScheduleNumber" that is 2 digits + "ComplianceScheduleType" that is 3 characters + "EnforcementActionIdentifier" that is 12 characters, "ScheduleProjectedDate", "ScheduleActualDate" b) "ReturnComplianceActualDate"	4 out of 5 SSC tags apply to ICIS, but they only apply if the ICIS "ScheduleEventCode" tag contains a code that has a description starting with "Comply with" ("ScheduleEventCode" allows codes for many activities beyond simply being in compliance.) XML tag standard has "ComplianceScheduleIndicator**Code**" and "ReturnComplianceSchedule**d**Date" but not the other 3 SCC tags.
SC_ControlMethodology_v2.0.xsd	a) CAFOInspectionSubmission, CAFOPermitSubmission b) BiosolidsPermitSubmission c) PermittedFeatureSubmission	Components are called "MethodologyTypeText" that is 30 characters, "MethodologyDescriptionText" that is 120 characters. ICIS calls them a) "ManureLitterProcessedWastewaterStorageType" and is 3 character code, "OtherStorageTypeName" and is 50 characters b) "BiosolidsEndUseDisposalTypeCode" that is 3 character code c) "PermittedFeatureTreatmentTypeCode" that is 3 characters long	2 out of 2 SSC tags apply to ICIS.
SC_CoordinateDataSource_v2.0.xsd	N/A	Not applicable to ICIS	N/A
SC_CountryIdentity_v2.0.xsd	See SC_LocationAddress_v2.0.xsd and SC_MailingAddress_v2.0.xsd		1 out of 3 SSC tags apply to ICIS.
SC_CountyIdentity_v2.0.xsd	See SC_LocationAddress_v2.0.xsd and SC_MailingAddress_v2.0.xsd		2 out of 3 SSC tags apply to ICIS.
SC_ElectronicAddress_v2.0.xsd	BasicPermitSubmission, GeneralPermitSubmission, BiosolidsPermitSubmission, CAFOInspectionSubmission, CAFOPermitSubmission, FacilitySubmission,	Component is called "ElectronicAddressText" that is 100 characters. ICIS does the same. Component is called "ElectronicAddressTypeName" that is 10 character code from static list. ICIS calls it "ElectronicAddressTypeCode" and is 3 character	2 out of 2 SSC tags apply to ICIS.

	PermittedFeatureSubmission, SWEventReportSubmission, SWInspectionSubmission, SWMS4ProgramReportSubmission, SWMS4LargePermitSubmission, SWMS4SmallPermitSubmission, SWMS4ProgramReportSubmission, ComplianceMonitoringSubmission, PretreatmentPermitSubmission	code.	
SC_EnforcementActionIdentity_v2.0.xsd	a) ComplianceMonitoringLinkageSubmission, ComplianceScheduleSubmission. EnforcementActionViolationKeySubmission, FormalEnforcementActionSubmission, InformalEnforcementActionSubmission, LimitsSubmission, SubActivitySubmission b) InformalEnforcementActionSubmission c) FormalEnforcementActionSubmission	Components called "EnforcementActionIdentifier" that is 20 characters, "EnforcementActionName" and is 200 characters, and "EnforcementActionDate. ICIS calls them: a) "EnforcementActionIdentifier" that is 12 characters b) "EnforcementActionName" that is 100 characters c) "FinalOrderEnteredDate"	3 out of 5 SSC tags apply to ICIS.
SC_EnforcementActionInjunctiveRelief_v2.0.xsd	N/A	Not applicable to ICIS	N/A
SC_EnforcementDescription_v2.0.xsd	FormalEnforcementActionSubmission, InformalEnforcementActionSubmission	Component called "EnforcementActionTypeCode" that is any length of characters, "EnforcementActionStatusDate", and "EnforcementActionSupplementalInformationText" that is any length of characters. ICIS calls them "EnforcementActionTypeCode" that is 3 character code, "EnforcementActionDate" and "InformalEACommentText" that is 4000 characters.	3 out of 10 SSC tags apply to ICIS. Status must be derived from ICIS subactivities. XML tag standard has "EnforcementActionType**Name**" but not SCC's "EnforcementActionSupplementalInformationText".
SC_FacilityManagementType_v2.0.xsd	FacilitySubmission	Component called "FacilityManagementTypeCode" that is 7 character code. ICIS calls it "FacilityClassification" and is 3 character code.	1 of 3 SSC tags apply to ICIS but not 100% sure. The codes used by SCC and ICIS are completely different but some of the code descriptions are similar.
SC_FacilityNAICS_v2.0.xsd	FacilitySubmission	Components are called "NAICSCode" that is 6 character code and "NAICSPrimaryIndicator"	2 out of 2 SSC tags apply to ICIS.

		that is 8 characters. ICIS calls them "NAICSCode" that is 6 character code and "NAICSPrimaryIndicatorCode" that is Y, N or blank.	
SC_FacilitySIC_v2.0.xsd	BasicPermitSubmission, MasterGeneralPermitSubmission, GeneralPermitSubmission	Components are called "SICCode" that is 4 character code and "SICPrimaryIndicator" that is 8 characters. ICIS calls them "SICCode" that is 4 character code and "SICPrimaryIndicatorCode" that is Y, N or blank.	2 out of 2 SSC tags apply to ICIS.
SC_FacilitySiteIdentity_v2.0.xsd	FacilitySubmission	Components are called "FacilitySiteName" that is 80 characters, and "FederalFacilityIndicator" that is Y or N. ICIS calls them "FacilitySiteName" that is 200 characters and "FederalFacilityIndicatorCode" that is Y or N.	2 out of 4 SSC tags apply. Not sure if SSC tag "FacilitySiteType" applies because it is not in the XML tag standard to get the characteristics from.
SC_FacilitySiteType_v2.0.xsd	N/A	Not applicable to ICIS.	N/A (see line above)
SC_FormIdentity_v2.0.xsd	N/A	Not applicable to ICIS.	N/A (see line above)
SC_FormInstruction_v2.0.xsd	N/A	Not applicable to ICIS.	N/A (see line above)
SC_GeographicLocationDescription_v2.0.xsd	a) FacilitySubmission b) FacilitySubmission, PermittedFeatureSubmission, CSOInspectionSubmission, CSOEventReportSubmission, SSOEventReportSubmission, SSOInspectionSubmission	Components are called "LatitudeMeasure" that is 10 numbers, "LongitudeMeasure" that is 11 numbers, "SourceMapScaleNumber" that is 10 numbers, "HorizontalAccuracyMeasure" that is 6 numbers, "HorizontalCollectionMethod" that is 3 character code, "GeographicReferencePointCode" that is a 3 character code, "GeographicReferenceDatumCode" that is 3 characters, and "GeometricTypeCode" that is 3 character code. ICIS calls them: a) "ConstructionProjectLatitudeMeaure" that is 10 numbers, and "ConstructionProjectLongitudeMeasure" that is 11 numbers b) "LatitudeMeasure" that is 10 numbers, "LongitudeMeasure" that is 11 numbers, "SourceMapScaleNumber" that is 10 numbers, "HorizontalAccuracyMeasure" that is 6 numbers, "HorizontalCollectionMethodCode"	8 out of 15 SCC tag apply to ICIS. XML tag standard has "SourceMapScaleNum**eric**" instead of SCC "SourceMapScaleNumber", "HorizontalCollectionMethod**Code**" instead of SCC's "HorizontalCollectionMethod", and "**HorizontalCoordinateReferenceSystem**DatumCode" instead of SCC's "GeographicReferenceDatumCode".

		that is 3 characters, "ReferencePointCode" that is a 3 character code, "HorizontalReferenceDatumCode" that is 3 character code, and "GeometricTypeCode" that is 3 character code. .	
SC_GeographicReferenceDatum_v2.0.xsd	See SC_GeographicLocationDescription_v2.0.xsd		1 out of 3 SSC tags apply to ICIS.
SC_GeographicReferencePoint_v2.0.xsd	See SC_GeographicLocationDescription_v2.0.xsd		1 out of 3 SSC tags apply to ICIS.
SC_GeometricType_v2.0.xsd	See SC_GeographicLocationDescription_v2.0.xsd		1 out of 3 SSC tags apply to ICIS.
SC_IndividualIdentity_v2.0.xsd	a) DischargeMonitoringReportSubmission b) BasicPermitSubmission, GeneralPermitSubmission, BiosolidsPermitSubmission, CAFOInspectionSubmission, CAFOPermitSubmission, FacilitySubmission, PermittedFeatureSubmission, SWEventReportSubmission, SWInspectionSubmission, SWMS4ProgramReportSubmission, SWMS4LargePermitSubmission, SWMS4SmallPermitSubmission, SWMS4ProgramReportSubmission, ComplianceMonitoringSubmission, c) PretreatmentPermitSubmission	Components are called "FirstName" that is 30 characters, "MiddleName" that is 10 characters, and "LastName" that is 30 characters. ICIS calls them: a) "PrincipalExecutiveOfficerFirstName" that is 30 characters, "SignatoryFirstName" that is 30 characters, "PrincipalExecutiveOfficerLastName" that is 30 characters, and "SignatoryLastName" that is 30 characters. b) "FirstName" that is 30 characters, "MiddleName" that is 10 characters, and "LastName" that is 30 characters.	3 out of 3 SSC tags apply to ICIS.
SC_LaboratoryIdentity_v2.0.xsd	N/A	Not applicable to ICIS	N/A
SC_LocationAddress_v2.0.xsd	BasicPermitSubmission, GeneralPermitSubmission, BiosolidsPermitSubmission,	Components are called "LocationAddressText" that is 50 characters, "SupplementalLocationText" that is 50	10 out of 10 SCC tags apply to ICIS. XML tag standard has "**Location**CountryCode" instead of SCC's "CountryCode", and

	CAFOInspectionSubmission, CAFOPermitSubmission, FacilitySubmission, PermittedFeatureSubmission, SWEventReportSubmission, SWInspectionSubmission, SWMS4ProgramReportSubmission, SWMS4LargePermitSubmission, SWMS4SmallPermitSubmission, SWMS4ProgramReportSubmission, ComplianceMonitoringSubmission, PretreatmentPermitSubmission, FacilitySubmission, BasicPermitSubmission, GeneralPermitSubmission, ComplianceMonitoringSubmission, FormalEnforcementActionSubmission, InformalEnforcementActionSubmission, EffluentTradePartner	characters, "LocalityName" that is 60 characters, "StateCode" that is 2 character code, "AddressPostalCode" that is 14 characters, "CountryCode" that is 2 character code, "CountyCode" that is 5 character code, and "TribalCode" that is 3 characters. ICIS calls them "LocationAddressText" that is 50 characters, "SupplementalLocationText" that is 50 characters, "LocalityName" that is 60 characters, "StateCode" that is 2 characters, "LocationZipCode" that is 14 characters, "LocationCountryCode" that is 3 character code CountyCode" that is 5 character code, "CountyName" that is 35 characters, and "TribalLandCode" that is 4 character code.	"County**StateFIPS**Code", "**LocationAddress**CountyCode" instead of SCC's "CountyCode", and "**LocationZipCode**" instead of SCC's "AddressPostalCode".
SC_MailingAddress_v2.0.xsd	BasicPermitSubmission, GeneralPermitSubmission, BiosolidsPermitSubmission, CAFOInspectionSubmission, CAFOPermitSubmission, FacilitySubmission, PermittedFeatureSubmission, SWEventReportSubmission, SWInspectionSubmission, SWMS4ProgramReportSubmission, SWMS4LargePermitSubmission, SWMS4SmallPermitSubmission, SWMS4ProgramReportSubmission, ComplianceMonitoringSubmission, PretreatmentPermitSubmission	Components are called "MailingAddressText" that is 50 characters, "SupplementalAddressText" that is 50 characters, "MailingAddressCityName" that is 30 characters, "StateCode" that is 2 characters, "AddressPostalCode" that is 14 characters, and "CountryCode" that is 2 characters. ICIS has "MailingAddressText" that is 50 characters, "SupplementalAddressText" that is 50 characters, "MailingAddressCityName" that is 30 characters, "MailingAddressStateCode" that is 2 characters, "MailingAddressZipCode" that is 14 characters, and "MailingAddressCountryCode" that is 3 characters.	6 out of 6 SCC tags apply to ICIS. XML tag standard has "**MailingAddress**CountryCode" instead of SCC's "CountryCode", and "County**StateFIPS**Code", and "**MailingAddressZipCode**" instead of SCC's "AddressPostalCode".
SC_Measure_v2.0.xsd	DischargeMonitoringReportSubmission, LimitSubmission	Components are called "MeasureValue" that is 7 numbers and "MeasureUnitCode" that is 12 character code. ICIS has "NumericConditionQuantity" that is 8 numbers and "NumericReportUnitMeasureCode" that is 2	2 out of 4 SSC tags apply to ICIS.

		character code.	
SC_MeasureUnit_v2.0.xsd	See SC_Measure_v2.0		1 out of 3 SSC tags apply to ICIS.
SC_MonitoringCondition_v2.0.xsd	DischargeMonitoringReportSubmission, LimitSubmission	Components are called "MonitoringSiteDescription" that is 120 characters, "MonitoringFrequencyText" that is 25 characters, and "MethodIdentifierCode" that is 3 character code. ICIS has "MonitoringSiteDescriptionCode" that is 3 character code, "FrequencyOfAnalysisCode" that is 5 character code, and "SampleTypeText" that is 3 character code.	3 out of 4 SSC tags apply to ICIS. XML tag standard has "MethodIdentifier" instead of SSC's "MethodIdentifier**Code**".
SC_MonitoringLocationIdentity_v2.0.xsd	DischargeMonitoringReportSubmission DMRViolationSubmission EffluentTradePartnerSubmission EnforcementActionViolationKeySubmission LimitsSubmission	Component is called "MonitoringLocationIdentifier" that is 20 characters. ICIS has "LimitSetDesignator" that is 2 characters.	1 out of 4 SSC tags apply to ICIS. Based on the SCC definition, it may actually be the correct SSC tag for ICIS "MonitoringSiteDescriptionCode" or "PermittedFeatureIdentifier" + "LimitSetDesignator"?
SC_NAICSIdentity_v2.0.xsd	BasicPermitSubmission, MasterGeneralPermitSubmission, GeneralPermitSubmission	Components are called "NAICSCode" that is 6 character code and "NAICSPrimaryIndicator" that is 8 character code. ICIS calls them "NAICSCode" that is 6 character code and "NAICSPrimaryIndicatorCode" that is Y, N or blank.	2 out of 5 SSC tags apply to ICIS.
SC_OrganizationIdentity_v2.0.xsd	BasicPermitSubmission, GeneralPermitSubmission, BiosolidsPermitSubmission, CAFOInspectionSubmission, CAFOPermitSubmission, FacilitySubmission, PermittedFeatureSubmission, SWEventReportSubmission, SWInspectionSubmission, SWMS4ProgramReportSubmission, SWMS4LargePermitSubmission, SWMS4SmallPermitSubmission, SWMS4ProgramReportSubmission, ComplianceMonitoringSubmission, PretreatmentPermitSubmission EffluentTradePartnerSubmission	Component is called OrganizationFormalName that is 80 characters. ICIS has the same.	1 out of 2 SSC tags apply to ICIS.
SC_PenaltyIdentity_v2.0.xsd	FormalEnforcementActionSubmission, ComplianceScheduleSubmission	Compoents are called "PenaltyAmountRequired" and "StipulatedPenaltyAmountRequired" that are	2 out of 10 SSC tags apply to ICIS. XML tag standard has

		15 numbers. ICIS calls them "CashCivilPenaltyRequiredAmount", "ComplianceSchedulePenaltyAmount" and are 14 numbers with 2 decimal places.	"**CashCivil**Penalty**Required**Amount" instead of SCC's "PenaltyAmountRequired", and "StipulatedPenalty**Required**Amount" instead of SSC's "StipulatedPenaltyAmountRequired".
SC_PermitAdministration_v2.0.xsd	BasicPermitSubmission MasterGeneralPermitSubmission GeneralPermitSubmission PermitReissuanceSubmission	Components are called "PermitApplicationCompletionDate", "PermitIssueDate", "PermitEffectiveDate", "PermitExpirationDate", "PermitTerminationDate". ICIS calls them the same.	6 out of 7 SSC tags apply to ICIS.
SC_PermitEvent_v2.0.xsd	PermitTrackingEventSubmission	Component is called "PermitEventDate". ICIS calls it "PermitTrackingEventDate".	1 out of 2 SSC tags apply to ICIS.
SC_PermitIdentity_v2.0.xsd	All 45 submission types	Components are called "PermitIdentifier" that is 30 characters, "OtherPermitIdentifier" that is 30 characters, and "PermitTypeCode" that is 120 character code ICIS calls them "PermitIdentifier" that is 9 characters, "OtherPermitIdentifier" that is 9 characters, and "PermitTypeCode" that is 3 character code	2 out of 5 SSC tags apply to ICIS.
SC_PermitLimitCondition_v2.0.xsd	EffluentTradePartnerSubmission, LimitsSubmission, DischargeMonitoringReportSubmission, DMRViolationSubmission, EnforcementActionViolationKeySubmission	Components are called "ConditionIdentifier" that is 20 characters, "ConditionBasisText" that is 100 characters, "ConditionStartDate", "ConditionEndDate" and "NumericConditionQuantity" that is 8 characters. ICIS calls them "LimitSeasonNumber" that is 2 characters, "BasisOfLimit" that is 3 character code, "LimitStartDate", "LimitEndDate", and "NumericConditionQuantity" that is 8 characters.	5 out of 9 SSC tags apply to ICIS. XML tag standard has "**Basis**ConditionText" instead of SSC's "ConditionBasisText".
SC_PermittedFeature_v2.0.xsd	BiosolidsProgramReportSubmission, CSOEventReportSubmission, CSOInspectionSubmission, DischargeMonitoringReportSubmission, DMRViolationSubmission, EffluentTradePartnerSubmission, EnforcementActionViolationKeySubmission, LimitSetSubmission, LimitsSubmission,	Components are called "PermittedFeatureIdentifier" that is 40 characters, "PermittedFeatureTypeName" that is 40 characters, "PermittedFeatureDescriptionText" that is 1000 characters, "PermittedFeatureStartDate" and "PermittedFeatureEndDate". ICIS calls them "PermittedFeatureIdentifier" that is 4 characters, "PermittedFeatureTypeCode" that is 3 character code,	5 out of 6 SSC tags apply to ICIS.

	PermittedFeatureSubmission, SSOEventReportSubmission, SWEventReportSubmission	"PermittedFeatureDescription" that is 100 characters, "LimitSetStatusStartDate" and "LimitSetStatusEndDate".	
SC_PermitType_v2.0.xsd	See SC_PermitIdentity_v2.0.xsd		1 out of 3 SSC tags apply to ICIS.
SC_ReferenceMethod_v2.0.xsd	See SC_MonitoringCondition_v2.0.xsd		1 out of 5 SSC tags apply to ICIS.
SC_ReportIdentity_v2.0.xsd	a) BiosolidsProgramReportSubmission, CAFOAnnualReportSubmission, CSOEventReportSubmission, LocalLiimtsReportSubmission, PretreatmentProgramSummarySubmission, SSOAnnualReportSubmission, SSOEventReportSubmission, SSOMonthlyEventReportSubmission, SWEventReportSubmission b) DischargeMonitoringReportSubmission,DMRViolationSubmission, EnforcementActionViolationKeySubmission	Components are called "ReportReceivedDate", "ReportingPeriodStartDate", and "ReportingPeriodEndDate". ICIS calls them: a) "BiosolidsProgramReportReceivedDate", "ReportCoverageEndDate", "PermittingAuthorityReportReceivedDate", "CSOEventReportReceivedDate", "PretreatmentProgramSummaryStartDate", "PretreatmentProgramSummaryEndDate", "SSOAnnualReportReceivedDate", "SSOEventReportReceivedDate", "SSOMonthlyReportReceivedDate", "StormwaterEventReportReceivedDate" b) "MonitoringPeriodEndDate", "NumericReportReceivedDate"	3 out of 12 SSC tags apply to ICIS. XML tag standard does not have SSC's "ReportingPeriodStartDate", and "ReportingPeriodEndDate" tags.
SC_ReportingCondition_v2.0.xsd	BiosolidsProgramReportSubmission, DischargeMonitoringReportSubmission, LimitsSubmission	Component is called "ReportingFrequencyText" that is 30 characters. ICIS calls it "BiosolidsProgramReportFrequency" that is 3 character code, "ReportingFrequencyCode" that is 5 character code, and "FrequencyOfAnalysisCode" that is 5 character code.	1 out of 5 SSC tags apply to ICIS.
SC_ReportType_v2.0.xsd	See SC_ReportIdentity_v2.0.xsd		1 out of 3 SSC tags apply to ICIS.
SC_ResultQualifier_v2.0.xsd	N/A	Not application to ICIS.	N/A
SC_SICIdentity_v2.0.xsd	BasicPermitSubmission, MasterGeneralPermitSubmission, GeneralPermitSubmission	Components are called "SICCode" that is 4 character code and "SICPrimaryIndicator" that is 8 character code. ICIS calls them "SICCode" that is 4 character code and "SICPrimaryIndicatorCode" that is Y, N or blank.	2 out of 5 SSC tags apply to ICIS.
SC_StateIdentity_v2.0.xsd	See SC_LocationAddress_v2.0.xsd and SC_MailingAddress_v2.0.xsd		1 out of 3 SCC tags apply to ICIS
SC_SubstanceIdentity_v2.0.xsd	N/A	Not application to ICIS.	N/A
SC_Telephonic_v2.0.xsd	BasicPermitSubmission,	Component is called "TelephoneNumberText"	2 out of 3 SSC tags apply to ICIS.

	GeneralPermitSubmission, , DischargeMonitoringReportSubmission, BiosolidsPermitSubmission, CAFOInspectionSubmission, CAFOPermitSubmission, FacilitySubmission, PermittedFeatureSubmission, SWEventReportSubmission, SWInspectionSubmission, SWMS4ProgramReportSubmission, SWMS4LargePermitSubmission, SWMS4SmallPermitSubmission, SWMS4ProgramReportSubmission, ComplianceMonitoringSubmission, PretreatmentPermitSubmission	that is 15 characters and "TelephoneExtensionNumberText" that is 5 characters. ICIS calls it "DMRCognizantOfficialTelephoneNumber", "SignatoryTelephone", "TelephoneNumber" that are 15 characters, and "TelephoneExtensionNumber" that is 5 characters.	
SC_TribalIdentity_v2.0.xsd	See SC_LocationAddress_v2.0.xsd		1 out of 3 SSC tags apply to ICIS.
SC_ViolationIdentity_v2.0.xsd	CAFOInspectionSubmission, ScheduleEventViolationSubmission, SingleEventViolationSubmission, DischargeMonitoring	Components are called "ViolationTypeCode" that is any length of characters, "ViolationDeterminedDate", and "ViolationSupplementalInformationText" that is any length of characters. ICIS calls them "CAFOInspectionViolationTypeCode" that is 3 character code, "ScheduleViolationCode" that is 5 character code, "NumericReportViolationText" that is 5 character code, "SingleEventViolationText" that is 5 character code, "RNCDetectionDate", and "SingleEventCommentText" that is 4000 characters.	3 out of 3 SSC tags apply to ICIS. XML tag standard does not have SSC's "ViolationTypeCode" and "ViolationSupplementalInformationText" tags.
SC_ViolationType_v2.0.xsd	See SC_ViolationIdentity_v2.0.xsd		1 out of 3 SSC tags apply to ICIS.