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mon_v3_0.xsd", xmlns:xsd="http://www.w3.org/2001/XMLSchema",
elementFormDefault="qualified">
version="3.0">
<xsd:include schemaLocation="EN_NEI_Common_v3_0.xsd"/>
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-->
Start of Schema Header
-->
_ <xsd:annotation>
angenetwork</xsd:documentation>
Point</xsd:documentation>
EI XML 3.0 Point data<xsd:documentation>
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by<xsd:documentation>
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user</xsd:documentation>
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http://www.w3.org/1.0" encoding="UTF-8" ?<xsd:documentation>
http://www.epa.gov/ea
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Header
on>
mentation>**Schema Name:** NEI XML 3.0
xsd:documentation>
mentation>**Current Version**
e:<http://www.epa.gov/exchangenetwork><xsd:documentation>
tion>
umentation>**Description:** The NEI XML 3.0 Point data<xsd:documentation>
format</xsd:documentation>
umentation>**Application:** Varies by<xsd:documentation>
ns:documentation>>Des
umentation>**Developed By:** Environmental Protection Agency<xsd:documentation>
ding="UTF-8" ?>

'http://www.epa.gov/exchangenetwork'
'http://www.w3.org/2001/XMLSchema'
'http://www.epa.gov/exchangenetwork'
t="qualified" attributeFormDefault="unqualified">
aLocation="EN_NEI_Common_v3_0.xsd"/>

ion>**Schema Name:** NEI XML 3.0
cumentation>
on>**Current Version**
'http://www.epa.gov/exchangenetwork</xsd:documentation>
>**Description:** The NEI XML 3.0 Point data<xsd:documentation>
Application: Varies by<xsd:documentation>

Institutional Controls Data Flow

Flow Configuration Document

Version: 1.0

Revision Date: 5/17/2013

Prepared for: ECOS

Prepared by: Windsor Solutions, Inc.

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1 Component Alignment

1.1 Flow Component Versions Currently Supported

Component	Version(s) Supported	Explanation (optional)
FCD	1.0	Initial version
Schema	1.0	Initial version
DET	1.0	Initial version

2 Introduction

2.1 Flow Identification

Flow Name: Institutional Controls (IC)

Flow Owner: Environmental Council of States (ECOS)

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2.2 Background

Institutional controls (ICs) are non-engineered instruments, such as administrative and legal controls, that help minimize the potential for human exposure to contamination and/or protect the integrity of the remedy. Although it is EPA's expectation that treatment or engineering controls will be used to address principal threat wastes and that groundwater will be returned to its beneficial use whenever practicable, ICs play an important role in site remedies because they reduce exposure to contamination by limiting land or resource use and guide human behavior at a site. For instance, zoning restrictions prevent site land uses, like residential uses, that are not consistent with the level of cleanup.

ICs are used when contamination is first discovered, when remedies are ongoing, and when residual contamination remains onsite at a level that does not allow for unrestricted use and unlimited exposure after cleanup. The National Contingency Plan¹ (NCP) emphasizes that ICs are meant to supplement engineering controls and that ICs will rarely be the sole remedy at a site.

An IC data standard² was first released in 2006 as a product of the Environmental Data Standards Council (EDSC). The standard was applied toward the development of Missouri's state environmental management system, and also developed partially into an IC XML schema by California Department of Toxic Substances Control.

The need for an IC schema has evolved since 2006. More states now inventory ICs in databases, many of which provide public facing displays. Enforcement interest in ICs has grown from merely inventorying ICs toward evaluation of their effectiveness. This is evidenced by states that periodically monitor ICs, and also states that assign affirmative obligations to landowners or responsible parties to report on IC obligations.

¹ For more information on the National Contingency Plan, visit <http://www.epa.gov/radiation/rert/ncp.html>

² The 2006 IC data standards and supporting documentation can be found at <http://www.exchanagenetwork.net/data-standards-list/>

2.3 Data Flow Overview

The IC data exchange defined in this Flow Configuration Document (FCD) provides a mechanism for government agencies to publish IC data over the Exchange Network using a standardized data format.

2.3.1 Business Need

A characteristic of ICs that motivates the need for this data flow is the overlapping interest with a common location between various stakeholders. For example, within a state, there may be overlapping IC inventories including:

- One-or-more environmental agencies/departments in the same state with overlapping but separate IC registries (e.g. California's State Water Resource Control Board and Department of Toxic Substances Control),
- An overlap between a state agency and the U.S. Environmental Protection Agency (e.g. an IC placed on a Superfund or RCRA Corrective Action site, and the same IC recorded within a state IC registry),
- An overlapping interest whereby a local and regional government maintains a governmental IC that are relied upon by a state registry, and
- Responsible parties interest that overlap with state interests. (e.g. DOE maintains an IC registry that may differ from a state's IC registry).

A parallel motivation that inspires exchanging IC information is toward maintaining the effectiveness of ICs. These include:

- Enforcing ICs by Local Government in the development review process.
- Advising of IC presence to contractors and engineers in the excavation clearance process
- Advising of ICs in the Phase I due diligence prior to property acquisition.

2.3.2 Flow Process

The IC data flow will support only Data Publishing, providing a number of Query and Solicit services. The IC data for the services is provided solely by State agencies, and potentially private industry, therefore no Data Processing services are required. The Data Publishing services will support both REST and SOAP service requests. The general flow of processing when invoking a Data Publishing service is depicted in Figure 1 and Figure 2, below.

Query Service Process:

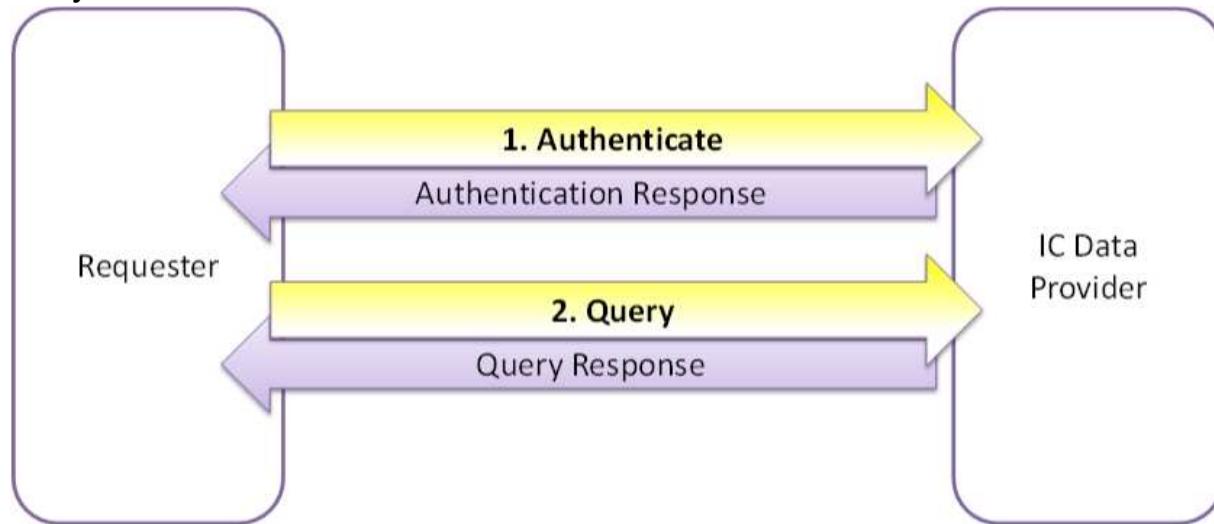


Figure 1

1. The requester, through a Node or Node Client, invokes the *Authenticate* method to initiate a session with the partner Node.
 - a. If authentication is successful, a Security Token will be returned.

Note: Alternatively, the requestor can authenticate directly to the National Authentication and Authorization Service (NAAS). NAAS will return a Security Token to the requester that can be used in the subsequent Query request to the IC Data provider.
2. The requestor, through a Node or Node Client, invokes the *Query* method, specifying one of the available IC data flow Query services and any associated service parameters (see section 3) and the valid Security Token.
 - a. If processing of the *Query* transaction is successful, an XML document conforming to the XML schema defined for the IC data flow is returned to the requester.
 - b. If processing of the *Query* transaction fails at any point, the IC Data Provider returns the appropriate Error Code as specified in the Exchange Network standard WSDL.

Solicit Service Process:

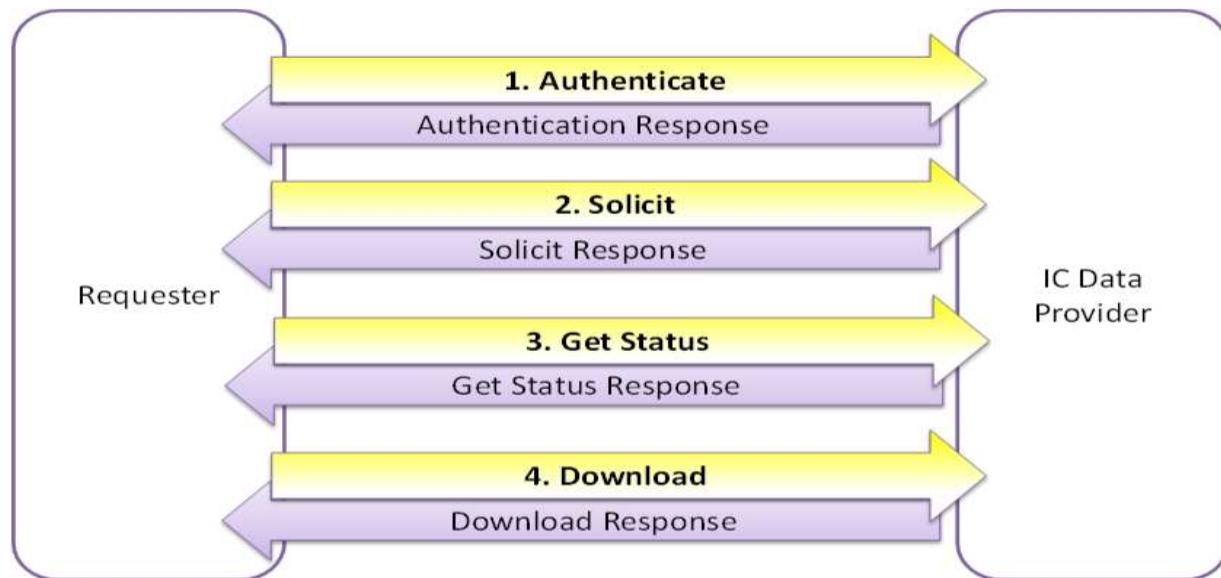


Figure 2

1. The requester, through a Node or Node Client, invokes the *Authenticate* method to initiate a session with the partner Node.
 - a. If authentication is successful, a Security Token will be returned.
Note: Alternatively, the requestor can authenticate directly to NAAS. NAAS will return a Security Token to the requester that can be used in the subsequent *Solicit* request to the IC Data provider.
2. The requestor, through a Node or Node Client, invokes the *Solicit* method, specifying one of the available IC data flow *Solicit* services and any associated service parameters (see section 3).
 - a. A Transaction ID is returned from the IC Data Provider to the Requester.
 - b. The status of the *Solicit* transaction is initially set to "Pending" on the IC Data Provider node.
 - c. Once the Node begins processing the *Solicit* transaction, the status is set to "Processing".
 - d. If processing of the *Solicit* transaction is successful, an XML document conforming to the XML schema defined for the IC data flow is saved to the IC Data Provider's Node, and the transaction status is set to "Completed".
 - e. If processing of the *Solicit* transaction fails at any point, the transaction status is set to "Failed".
3. The Requester, through a Node or Node Client, invokes the *Get Status* method, using the previously obtained Transaction ID and Security Token, to determine the status of the *Solicit* transaction.
4. Once the *Solicit* transaction reaches the "Complete" status, the requester may, through a Node or Node Client, invoke the *Download* method, using the previously obtained Transaction ID and Security Token. The IC XML payload document will then be downloaded to the requester from the IC Data Provider's Node.

2.4 Flow Access and Security

The EPA NAAS has typically been the security mechanism for data flows. However, NAAS security is not a prerequisite for this data flow. IC Data Providers must determine the security they will require, if any, for access to their data. IC Data providers may set up security policies in NAAS to control access to the IC services, however this is not required. Each data provider must choose their own security needs and implement accordingly.

All requests to SOAP services must be accompanied by a valid NAAS security token per the Exchange Network's Node 2.0 specifications. All consumers accessing the IC data flow must be authorized to NAAS and receive a valid security token before the IC services can be invoked by a SOAP request.

In addition, IC data providers may also choose to "protect" the IC data flow on their Node, preventing access to IC data unless a NAAS user account is granted explicit access to the flow. In this case, the consumer wishing to gain access to the IC data must contact the provider's IC data flow steward, and request authorization to the IC data flow for the NAAS account being used to invoke IC data flow services.

2.5 Flow-level Business Rules

Current Business Rules:

None other than those documented in the IC XML Schema and DET.

Fault Follow-up Actions:

Because this is a data publishing flow, errors that occur will be during the execution of Query and Solicit services, and descriptive errors messages will be returned to the requestor executing the service. The requestor must correct the error and resubmit the request.

3 Data Publishing

The IC data flow publishing services publish information about institutional controls filtered using the parameter values provided by the partner requesting the information. The data publishing services provided as part of the IC data flow are invoked either synchronously (Query) or asynchronously (Solicit).

3.1 Institutional Controls Data Publishing (Query/Solicit)

In the case of a Query service request, results are returned immediately to the requesting partner upon completion of the Query request.

In the case of a Solicit service request, the request is submitted to the partner Node whose IC data is being requested, but the actual results are not immediately returned, instead returning the transaction identifier (TransactionID) of the service request. The requesting partner will use the TransactionID with the GetStatus service to retrieve the status of the Solicit service request. When completed, the TransactionID is used with the Download service to retrieve the results of the Solicit service request. Refer to section 2.3 for additional information.

In either case (Query or Solicit) the result information is returned, or published, as an XML formatted document. The published XML document will conform to the XML schema defined for the IC data flow.

Data Service Summary:

Service Name	Service Type(s)	Notes
GetICDataByParameters_v1.0	Query or Solicit	Allows for a variety of filter criteria to be supplied when retrieving institutional control data.
GetICDataByBoundingBox_v1.0	Query or Solicit	Returns all IC data within a bounding box (area) specified by maximum and minimum latitude/longitude coordinate pairs.
GetICDataByChangeDate_v1.0	Query or Solicit	Used to support the creation and maintenance of a replica set of institutional control data across partners (i.e., data synchronization).

3.1.1 GetICDataByParameters_v1.0

Allows for a variety of filter criteria to be supplied when retrieving institutional control data. Supplying no criteria returns all IC records on the partner Node.

Type: Query or Solicit

Data Service-level Business Rules: Not applicable

XML Header Usage: Not applicable

3.1.1.1 Request

Dataflow: IC_v1

Request: GetICDataByParameters_v1.0

rowId: An optional parameter for the Query method that identifies the starting record number to be retrieved when returning paged results. A “row” in the IC data exchange is considered to be an instance of an Institutional Control element. One IC may have multiple Locations or Affiliations. Locations and Affiliations are not considered for the purpose of rowId and maxRows.

maxRows: An optional parameter for the Query method that identifies the maximum number of records to return.

Parameters:

Note: Some parameters allow multiple values to be supplied. If the request is being issued over a Node v1.1 endpoint, A pipe delimiter (i.e., '|') should be used between values.

Note: The requester must supply all four Bounding Coordinates or none at all.

Name	Data Type	Required	Max Length	Notes
InstrumentIdentifier	String	No (0..∞)	NA	Return institutional controls matching one or more of the instrument identifiers in the parameter array.
FacilityIdentifier	String	No (0..∞)	NA	Return institutional controls matching one or more of the facility identifiers in the parameter array.
FacilitySiteName	String	No (0..∞)	NA	Return institutional controls matching one or more of the facility site names in the parameter array. Use % to indicate a wildcard search.
UseRestrictionTypeCode	String	No (0..∞)	NA	Return institutional controls matching one or more of the Use Restriction type codes in the parameter array. Refer to the Institutional Controls

				XML schema for a list of valid values.
BoundingCoordinateNorth	Decimal	No (0-1)	NA	Maximum latitude value of bounding box expressed in decimal degrees.
BoundingCoordinateSouth	Decimal	No (0-1)	NA	Minimum latitude value of bounding box expressed in decimal degrees.
BoundingCoordinateWest	Decimal	No (0-1)	NA	Minimum longitude value of bounding box expressed in decimal degrees. Note that longitudinal values (in decimal degrees) are expressed as negative numbers within the Western Hemisphere.
BoundingCoordinateEast	Decimal	No (0-1)	NA	Maximum longitude value of bounding box expressed in decimal degrees. Note that longitudinal values (in decimal degrees) are expressed as negative numbers within the Western Hemisphere.
ChangeDate	Date	No (0-1)	NA	Date since any data element of an institutional control has been modified. Response will include all institutional controls that have changed on or after this date. Format of input date is YYYY-MM-DD

REST Query Example:

The following example is provided to illustrate how a REST-based query might be constructed for the service described above. Actual REST URL structure may vary by node and IC Data Provider.

`http://www.myagency.gov/ICData?
=Restrict%20Excavation&BoundingCoordinateNorth=41.97&BoundingCoordinateSouth=37.75&
BoundingCoordinateWest=-88.12&BoundingCoordinateEast=-84.66`

In the example above, the URL components are as follows:

Component Type	Component Example Value	
Server	<code>http://www.myagency.gov</code>	
Service	<code>ICData</code>	
Service Parameters	UseRestrictionTypeCode	<code>Restrict%20Excavation</code>
	BoundingCoordinateNorth	<code>41.97</code>
	BoundingCoordinateSouth	<code>37.75</code>
	BoundingCoordinateWest	<code>-88.12</code>
	BoundingCoordinateEast	<code>-84.66</code>

3.1.1.2 Response

Response:

- Query: XML document conforming to the **IC_v1.0.xsd** schema defined for the IC data flow.
- Solicit: TransactionID of the Solicit request returned from the partner Node.

3.1.2 GetICDataByBoundingBox_v1.0

Returns all IC data within a bounding box (area) specified by maximum and minimum latitude/longitude coordinate pairs.

Type: Query or Solicit

Data Service-level Business Rules: Not applicable

XML Header Usage: Not applicable

3.1.2.1 Request

Dataflow: IC_v1

Request: GetICDataByBoundingBox_v1.0

RowId: An optional parameter for the Query method that identifies the starting record number to be retrieved when returning paged results. A “row” in the IC data exchange is considered to be an instance of an Institutional Control element. One IC may have multiple Locations or Affiliations. Locations and Affiliations are not considered for the purpose of rowId and maxRows.

maxRows: An optional parameter for the Query method that identifies the maximum number of records to return.

Parameters:

Name	Data Type	Required	Max Length	Notes
BoundingCoordinateNorth	Decimal	Yes (1)	NA	Maximum latitude value of bounding box expressed in decimal degrees.
BoundingCoordinateSouth	Decimal	Yes (1)	NA	Minimum latitude value of bounding box expressed in decimal degrees.
BoundingCoordinateWest	Decimal	Yes (1)	NA	Minimum longitude value of bounding box expressed in decimal degrees. Note that longitudinal values (in decimal degrees) are expressed as negative numbers within the Western Hemisphere.
BoundingCoordinateEast	Decimal	Yes (1)	NA	Maximum longitude value of bounding box expressed in decimal degrees. Note that longitudinal values (in decimal degrees) are expressed as negative numbers within the Western Hemisphere.

REST Query Example:

The following example is provided to illustrate how a REST-based query might be constructed for the service described above. Actual REST URL structure may vary by node and IC Data Provider.

`http://www.myagency.gov/ICBoundingBoxData?BoundingCoordinateNorth=41.97&BoundingCoordinateSouth=37.75&BoundingCoordinateWest=-88.12&BoundingCoordinateEast=-84.66`

In the example above, the URL components are as follows:

Component Type	Component Example Value	
Server	<code>http://www.myagency.gov</code>	
Service	<code>ICBoundingBoxData</code>	
Service Parameters	BoundingCoordinateNorth	41.97
	BoundingCoordinateSouth	37.75
	BoundingCoordinateWest	-88.12
	BoundingCoordinateEast	-84.66

3.1.2.2 Response

Response:

- Query: XML document conforming to the **IC_v1.0.xsd** schema defined for the IC data flow.
- Solicit: TransactionID of the Solicit request returned from the partner Node.

3.1.3 GetICDataByChangeDate_v1.0

Used to support the creation and maintenance of a replica set of institutional control data across partners (i.e., data synchronization).

Type: Query or Solicit

Data Service-level Business Rules: Not applicable

XML Header Usage: Not applicable

3.1.3.1 Request

Dataflow: IC_v1

Request: GetICDataByChangeDate_v1.0

RowId: An optional parameter for the Query method that identifies the starting record number to be retrieved when returning paged results. A “row” in the IC data exchange is considered to be an instance of an Institutional Control element. One IC may have multiple Locations or Affiliations. Locations and Affiliations are not considered for the purpose of rowId and maxRows.

maxRows: An optional parameter for the Query method that identifies the maximum number of records to return.

Parameters:

Name	Data Type	Required	Max Length	Notes
ChangeDate	Date	Yes (1)	NA	Date since any data element of an institutional control has been modified. Response will include all institutional controls that have changed on or after this date. Format of input date is YYYY-MM-DD

REST Query Example:

The following example is provided to illustrate how a REST-based query might be constructed for the service described above. Actual REST URL structure may vary by node and IC Data Provider.

<http://www.myagency.gov/ICDataByChangeDate?ChangeDate=2012-01-01>

In the example above, the URL components are as follows:

Component Type	Component Example Value	
Server	http://www.myagency.gov	
Service	ICDataByChangeDate	
Service Parameters	ChangeDate	2012-01-01

3.1.3.2 Response

Response:

- Query: XML document conforming to the **IC_v1.0.xsd** schema defined for the IC data flow.
- Solicit: TransactionID of the Solicit request returned from the partner Node.

4 Schema Information

4.1 Schema Structure

