

Instructions for Area of Concern / Site Boundary GIS Submissions

GEOGRAPHIC INFORMATION SYSTEMS (GIS) INSTRUCTIONS

Contaminated Site Remediation & Redevelopment

New Jersey Department of Environmental Protection



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Instructions for Area of Concern / Site Boundary GIS Submissions

The following document will assist a submitter to prepare a submission for an Area of concern (AOC) / Site Boundary Geographic Information System (GIS) Deliverable. The specific requirements for GIS deliverables are outlined in the [Administrative Requirements for GIS Deliverables](#) Guidance document. This document supplements [Administrative Requirements for GIS Deliverables](#) with instructions specific to an AOC / Site Boundary Submission.

1. Introduction

The General reporting requirements in the Technical Requirements for Site (7:26E-1.6 (a)6.) requires the person responsible for conducting the remediation to submit with all reports a GIS compatible site plan that includes the site boundary and the location of all AOCs.

A site is a single contiguous area, which may have common ownership or be under the same operational control, and which has a potential or observed impact on public health and/or the environment requiring regulation by Contaminated Site Remediation & Redevelopment (CSRR). A site boundary depicts the property boundary associated with the municipal tax block(s) and lot(s) for the site.

An AOC, as defined in N.J.A.C. 7:26E-1.8, is any existing or former distinct location or environmental medium where any hazardous substance, hazardous waste, or pollutant is known or suspected to have been discharged, generated, manufactured, refined, transported, stored, handled, treated, or disposed, or where any hazardous substance, hazardous waste, or pollutant has or may have migrated. AOCs are tracked on a Case Inventory Document (CID) spreadsheet, which is a concise summary of all AOCs and major case components that serve to form the basis for remedial decisions. The person responsible for conducting the remediation is required to submit the CID Spreadsheet with all remedial phase reports (key documents) and all direct oversight documents that are submitted to CSRR. These documents are submitted through the Department of Environmental Protection's (Department) On-line (DEP On-line) Service. An AOC / Site Boundary GIS Deliverable should be attached to the DEP On-line service.

The polygons depicting the site boundary and distinct AOC locations must be submitted as a GIS shapefile or a Computer-Aided Design (CAD) dwg or dxf file. This file is submitted along with the CID spreadsheet. Environmental media such as a groundwater contaminant plume or area of impacted wetlands do not have to be mapped for this submittal even though they are also included as an AOC in the CID.

2. GIS Submission

The GIS compatible Site map, which is referred to as a "*GIS Deliverable*" comprises the site boundary and all the distinct AOC locations identified in the CID. This shall include all the AOCs mentioned in the CID Spreadsheet, except the Environmental Media AOCs. The AOC / Site Boundary GIS Deliverable is a spatial representation of all AOCs identified in the CID and is submitted via the DEP On-line service.

Each AOC and site boundary should be represented as an individual polygon, not as lines or points. For example, a 1-foot diameter drain should be mapped as a 1-foot circle with an area 0.79 ft², not a point. The DEP On-line service limits the files that can be uploaded, so all the files in the GIS Submission must be zipped into one file. The on-line submitter will attach the GIS Submission in the

allotted location during the Load Attachment portion of the service. The GIS Deliverable should be maintained with the same information as the CID and should be updated and attached to the service every time the CID is submitted. If the files cannot be submitted via the service, they can be emailed to srpgis_aoc@dep.nj.gov with all files included as email attachments.

2.1 Metadata Text File

The submitter shall include basic information about the Deliverable. This information, which is referred to as metadata, identifies: 1) the environmental company / LSRP (consultant) overseeing the work, 2) the professional who created the GIS submission and who would be contacted if there are GIS technical issues, and 3) the site identification information. The submitter should copy the [metadata templates](#) from the [GIS Deliverable Templates](#) web page or fields listed in figure 1 into a plain text file and then complete the fields with information about the submission. Then save the file using the naming protocol in Section 3.1. The metadata file should be zipped along with the GIS Deliverable and pdf map then attached to the DEP On-line service.

Figure 1. Metadata requirements. The required fields listed below need to be copied into the body of the email and the appropriate information completed for each field.

Program Interest Number for Site:
Activity Number:
Name of Site as known to NJDEP:
Street Address of Site:
Municipality of Site:
County of Site:
Submission Type Acronym:
Submission Description:
Name of LSRP (or consultant) overseeing work:
LSRP's License Number:
LSRP's Email Address:
Name of GIS Author Company:
Mailing Address:
Name of Professional performing GIS work:
Email for Professional performing GIS work:
Phone Number for Professional performing GIS work:

2.2 Spatial Accuracy

The accuracy of the GIS Deliverables must meet the standards established by the Department in the NJDEP Mapping and Digital Data Standards (current version issued on February 7, 2021).

2.3 PDF AOC / Site Boundary Map

A PDF version of the AOC / Site Boundary map should be included in the GIS Submittal. The information on the map should support the features in the GIS Deliverable, specifically the AOC and Site Boundaries. The pdf map should be zipped along with the GIS Deliverable and metadata file then attached to the DEP On-line service.

2.4 Resubmission of failed GIS Submission

If the AOC / Site Boundary Deliverable is not acceptable, an email response to the submitter will identify the issues and how to resubmit the GIS Deliverable. The corrected deliverable shall be emailed to srpgis_aoc@dep.nj.gov with all the required files included as email attachments.

3. GIS Deliverable

The GIS Deliverable shall be submitted as a GIS shapefile or a georeferenced .dwg or .dxf CAD drawing file utilizing the New Jersey State Plane Coordinate System, North American Datum of 1983 (NAD83), using feet as the units of measure. The deliverable should consist of polygon(s) that represent the horizontal extent of the distinct site boundary and AOC locations.

3.1 AOC / Site Boundary GIS Deliverable and Metadata Text File Naming Protocol

The AOC / Site Boundary GIS Deliverable should be named as the Program Interest number of the CSRR case followed by an underscore and then the date of submission (YYYYMMDD) followed by AOC, which is the valid Submittal Type Acronym for this submission (Figure 2). The metadata text file should use the same naming protocol with ‘_metadata’ added as an additional suffix.

Figure 2. Examples of the File Naming Protocol for an AOC / Site Boundary GIS Deliverable

<u>File Naming example for AOC / Site Boundary submission:</u>	
Site Name:	ABC Industry
Program Interest number:	013164
Date of Submittal:	April 1, 2017 (in yyyyymmdd format)
<u>Correct File Name for this example:</u>	
013164_20170401AOC	
<u>Correct Metadata File Name for this example:</u>	
013164_20170401AOC_metadata.txt	

3.2 GIS Deliverable Types

A GIS Deliverable is submitted as either a GIS shapefile or CAD drawing file. The shapefile is the preferred format for all CSRR GIS submittals since it is easily imported into GIS. A shapefile is an open geospatial vector data format for GIS software. It can be created by several different GIS software programs. A CAD drawing is a group of points, lines, polylines, and text that are organized by layers to produce technical drawings. Each drawing feature contains information used to produce the drawing such as line weight, line type and color. This format can be used to produce a GIS Deliverable provided several guidelines are followed. A CAD file must be carefully prepared for the conversion into a GIS usable format to be successful. All AOC / Site Boundary GIS Deliverables should conform to the structure, or schema, outlined in the [Administrative Requirements for GIS Deliverables](#).

3.3 GIS Deliverable Schema

The GIS Deliverable must include all the distinct AOC locations contained in the CID and the site boundary. These features should be drawn as polygons and included in one deliverable. The structure or schema of the file should conform to the tables below depending on if it is a Shapefile or CAD file. The attribute values for the polygons must correspond to the information contained in the CID. The GIS Deliverable must be zipped with the metadata text file and the PDF map before submitting via the DEP On-line service.

3.3.1 Shapefile Schema

The schema in Table 1 should be used when creating a shapefile for an AOC / Site Boundary Deliverable. The GIS Deliverable incorporates information from the CID and is submitted in the same DEP On-line service as the Case Inventory Document (CID). It

should include a single polygon for the site boundary and one for each AOC included in the CID spreadsheet, except for the Environmental Media. A multi-part polygon should be created for a site property with non-contiguous boundaries. Do not provide a polygon for the Environmental media even though they are included as an AOC in the CID.

The value in the Type field is used to distinguish between AOC polygons and the Site Boundary polygon. For the Site Boundary polygon, the value of the Type field should be “Site Boundary” and the AOC polygons should be “AOC Boundary.” Only the Type field needs to be completed for the Site Boundary feature, all the other fields are left blank. For AOC shapes, the values for AOC_ID, AOC_Type, Descript and NJDEP_ID in the shapefile attributes table must correspond to the values in Column A, B, C, and I in the CID, respectfully. The AOC_ID field is used to link the shape to the CID record so it must match the value in column A (AOC ID) in the CID. The AOC_Type field should be copied from column B (AOC Type) in the CID. Since the Descript field in the shapefile is limited to 254 characters, the value from column C (AOC Description) in the CID may need to be modified to fit the length constraint of the shapefile. The NJDEP_ID is Assigned to the AOC by the Department when the CID is first uploaded in a DEP On-line service. It will be blank for the original submittal of an AOC shape but populated in subsequent submittals. More information is provided in the [Instructions for Completing the CID](#).

An [AOC / Site Boundary Shapefile Template](#) is available for download from CSRR’s [GIS Deliverables Templates](#) web page.

Table 1. AOC / Site Boundary Shapefile Schema

Field Name	Type	Length	Description	Valid Values
FID	Object ID	-	Esri unique identifier	n/a
Shape	Geometry	-	Esri geometry field	n/a
Type	Text	50	What the shape (feature) represents	AOC Boundary Site Boundary
AOC_ID ①	Text	100	Unique identifier used in the CID	Column A from CID
AOC_Type ①	Text	100	AOC type assigned to the AOC in the CID	Column B from CID
Descript ①	Text	254	concise and unique description of the AOC	Column C from CID
NJDEP_ID ①	Double	-	Assigned to the AOC by the Department when the CID is first uploaded in a DEP On-line service ②	Column I from CID

Notes: ① *Do not complete if the Type is Site Boundary*
 ② *Only required after the Department assigns an ID after the initial upload*

3.3.2 CAD File schema

The schema in table 2 should be used when creating a CAD file as an AOC / Site Boundary Deliverable. The CAD file may include features other than the AOC / Site Boundary boundaries, but the best submittal practice is to create a CAD file that only includes the polygons associated with the CID and the site boundary. The GIS Deliverable incorporates information from the CID and is submitted in the same DEP On-line service. It can include multiple polygons for the site boundary if the Boundaries are not contiguous and one polygon for each AOC included in the Case Inventory Document (CID)

spreadsheet, except for the Environmental Media. Do not provide a polygon for the Environmental media even though they are included as an AOC in the CID.

The value in the Layer field is used to distinguish between AOC polygons and Site Boundary polygons. For the Site Boundary polygons, the value of the Layer field should be “Site Boundary” and the AOC polygons should be “AOC Boundary.” Please do not name any other point, polyline, annotation, graphic, or any other map element in this way. Additional fields must be added to the CAD file to accommodate the schema for the AOC / Site Boundary Deliverable. The AOC_ID, AOC_Type, Descript and NJDEP_ID fields should be added to the CAD drawing and completed as outlined below.

For the Site Boundary shape, only the Layer field is populated, all other fields are left blank. For AOC shapes, the values for AOC_ID, AOC_Type, Descript and NJDEP_ID in the CAD file table must correspond to the values in Column A, B, C, and I in the CID, respectfully. The AOC_ID field is used to link the shape to the CID record so it must match the value in column A (AOC ID) in the CID. The AOC_Type field should be copied from column B (AOC Type) in the CID. Since the Descript field is limited to 254 characters, the value from column C (AOC Description) may need to be modified to fit the length constraint. The NJDEP_ID is Assigned to the AOC by the Department when the CID is first uploaded in a DEP On-line service. It will be blank for the original submittal of an AOC shape but populated in subsequent submittals. More information is provided in the [Instructions for Completing the CID](#).

The CAD values for the polygons of concern must correspond to the information contained in the CID.

Table 2. AOC / Site Boundary CAD Drawing Schema

Field Name	Type	Length	Description	Valid Values
Layer	Text	50	What the shape (feature) represents	AOC Boundary Site Boundary
AOC_ID ①	Text	100	Unique identifier used in the CID	Column A from CID
AOC_Type ①	Text	100	AOC type assigned to the AOC in the CID	Column B from CID
Descript ①	Text	254	concise and unique description of the AOC	Column C from CID
NJDEP_ID ①	Double	-	Assigned to the AOC by the Department when the CID is first uploaded in a DEP On-line service ②	Column I from CID

Notes: ① *Do not complete if the Type is Site Boundary*

② *Only required after the Department assigns an ID after the initial upload*

The GIS Deliverable must be georeferenced and should be defined in “model space.” CAD drawings with a locally established point of origin (0,0) are not acceptable as these have not been georeferenced to the NJ State Plane Coordinate System and if submitted, will be returned for correction. The site boundary and AOC features in the CAD drawing must be a polygon. The best submittal practice is to create a CAD file that only includes these features.

Additional [CAD Help](#) is provided on CSRR’s GIS web page under Guidance Documents and in the [Administrative Requirements for GIS Deliverables](#).

4. GIS Submittal Example

The following are examples of AOC / Site Boundary Deliverables for a fictitious site named ABC Industry with a Preferred ID of 013164. The site has identified five distinct AOC locations and one environmental media AOC. Figure 3 is a portion of the CID spreadsheet for this site. Rows six through ten are the AOCs that must have a corresponding polygon in the GIS Deliverable. AOC GW (Row 11) is not mapped because it is an environmental media AOC. The GIS Deliverable also must include a polygon for the site boundary. The attribute information must reflect the CID information. The Deliverable was created on April 1, 2017.

Figure 3. Columns A, B, C, and I from the CID spreadsheet for fictitious ABC Industry site

	A	B	C	I
1	Case Name:	ABC Industry	IMPORTANT:	
2	PI #:	013164	Validate For Upload	
3	Activity #:	LSR190001	Enable Editing	
4	Case Inventory Document Version 1.5.1 02/04/21			
5	AOC ID	AOC Type	AOC Description	NJDEP ID
6	AOC 1	Discharge and disposal area - Waste water treatment systems/septic/seepage pit/dry well	Former Leach Field for process waste	208899
7	AOC 2	Discharge and disposal area - Landfill	Former Process Area & former Closed Landfill	208900
8	AOC 3	Storage tank and appurtenance - Above ground storage tank	Two 2,000-gallon AST - hazardous chemicals	208901
9	AOC 4	Storage tank and appurtenance - State or Federal Regulated underground storage tank	Former gasoline UST area: two 4,000-gallon gasoline and one 2,000-gallon-gasoline USTs	208902
10	AOC 5	Other areas of concern - Electrical transformer and capacitor	Soil at former electric power yard	208903
11	AOC GW	Environmental media - Media Ground water	Ground Water contamination associated with site activities	208904

4.1 Deliverable examples

An AOC / Site Boundary GIS Submittal must accompany remedial phase reports (key documents) and all direct oversight documents. The Deliverable should be zipped with a PDF map and Metadata text file and then attached to the DEP On-line service.

4.1.1 AOC / Site Boundary Shapefile Deliverable

To complete the Deliverable, the AOC_Site_Boundary Shapefile Template was downloaded from the web site and added to a GIS program. The site boundary and 5 AOCs were added as a polygon (Figure 4) to the shapefile. The attribute table (Table 3) was filled in based on the information in the CID Spreadsheet (Figure 3). The same AOC_ID was used in the CID and the GIS Deliverable so that the shapes can be linked to the correct CID entry. The AOC_Type, Descript and NJDEP_ID also should be copied directly from the CID into the shapefile attribute table.

Instead of downloading the AOC / Site Boundary template from the web, a user could create a shapefile from scratch using the schema in Table 1.

Figure 4. Map of the Shapefile used in AOC Deliverable example. The six polygons depict the Site Boundary and the 5 AOCs at the fictitious ABC Industry Site.



Table 4. GIS attribute table for the AOC / Site Boundary Deliverable shown in figure 4.

FID	Shape	Type	AOC_ID	AOC_Type	Descript	NJDEP_ID
0	Polygon	Site Boundary				
1	Polygon	AOC Boundary	AOC 1	Discharge and disposal area - Waste water treatment systems/septic/seepage pit/dry well	Former Leach Field for process waste	208899
2	Polygon	AOC Boundary	AOC 2	Discharge and disposal area - Landfill	Former Process Area & former Closed Landfill	208900
3	Polygon	AOC Boundary	AOC 3	Storage tank and appurtenance - Above ground storage tank	Two 2,000-gallon AST - hazardous chemicals	208901
4	Polygon	AOC Boundary	AOC 4	Storage tank and appurtenance - State or Federal Regulated underground storage tank	Former gasoline UST area: two 4,000-gallon gasoline and one 2,000 gallon-gasoline USTs	208902
5	Polygon	AOC Boundary	AOC 5	Other areas of concern - Electrical transformer and capacitor	Soil at former electric power yard	208903

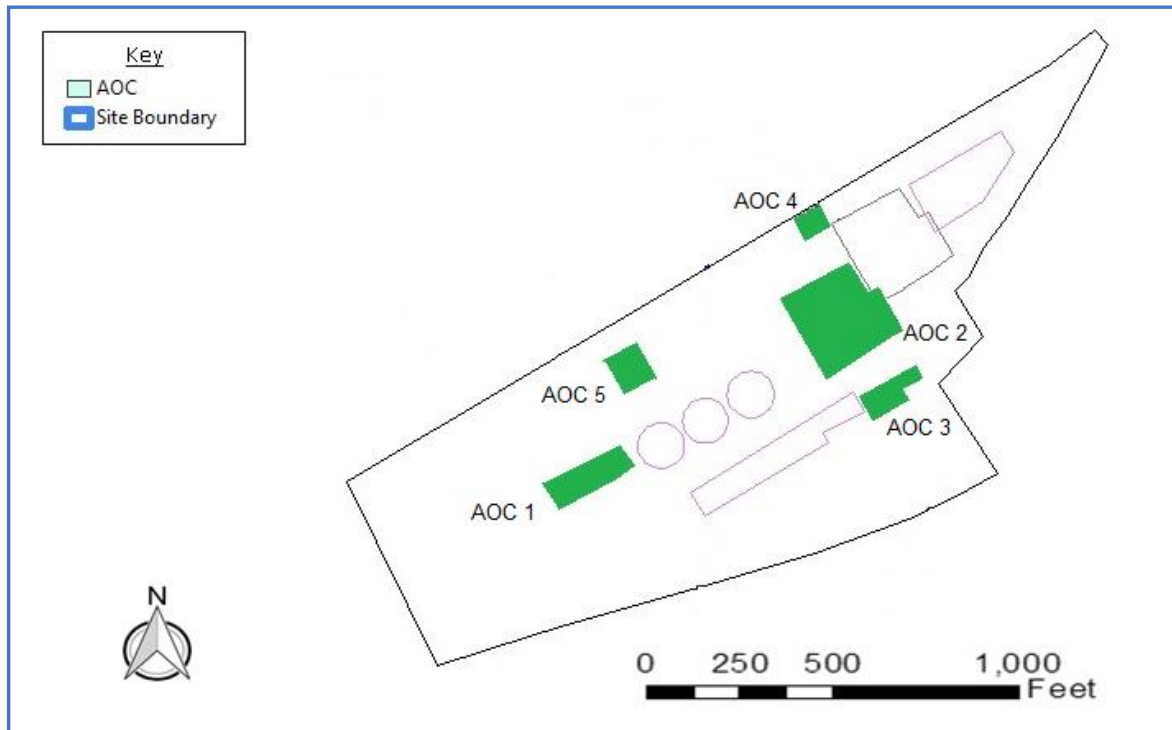
4.1.2 AOC / Site Boundary CAD file Deliverable

A CAD deliverable has some minor differences from a shapefile deliverable. A CAD file may be used for several different purposes and is usually retrofitted to become a GIS Deliverable by georeferencing the drawing and adding the Site Boundary and/or AOC features into an existing CAD file. Additional features (polygons) other than the required features are permitted in a CAD file but it is suggested that a clean CAD drawing be created with only the polygon(s) of concern. All CAD files must be georeferenced.

To complete the example Deliverable:

- Use an existing CAD file for the site
- Import DEP Imagery into CAD file and georeferenced the drawing. The [CAD Help](#) section of CSRR's GIS web page has guidance on importing Imagery and georeferencing.
- Add four fields to the CAD file. Name the fields AOC_ID, AOC_Type, Descript, NJDEP_ID.
- If they are not already present, add the Site Boundary and AOC polygons to the CAD file (figure 5). The features must be polygons, they cannot be a series of line segments.
- Enter information from the CID spreadsheet to the CAD file (table 4) for each feature.
 - Enter the value 'Site Boundary' into the layer field for the boundary of the site and 'AOC Boundary' for the five AOC boundaries. Since the layer field identifies the type of feature, the phrases 'Site Boundary' and 'AOC Boundary' cannot be used for any other feature in the CAD file.
 - Copy the AOC_ID from the CID into the attribute table. The AOC_IDs need to match exactly so that the CID and CAD file can be linked together.
 - Continue copying the AOC_Type from the CID into the AOC_Type field, the AOC Description into the Descript field, and the NJDEP_ID into the NJDEP_ID field.
 - Repeat the process for each of the AOCs in the CID
- Use the Purge and Explode commands, if necessary, to clean the drawing and improve the uploading into GIS.
- Name the file using the protocol in Section 3.1 (013164_20170401AOC.dwg)

Figure 5. Drawing of the CAD file used in the AOC example. The CAD Drawing includes multiple features including the Site Boundary and AOC boundaries



4.2 Submittal (on-line service)

Before creating the Key document On-line Service, the GIS Deliverable, metadata file and pdf map should be zipped into a single file allowing the Submittal to be uploaded during the service.

The following steps:

- 1) Download the [metadata templates](#) from the [GIS Deliverable Templates](#) web page document and fill in the information as needed. Save the file using the naming protocol in Section 3.1 (013164_20170401AOC_metadata.txt for this example).
- 3) Open a zip file and include
 - PDF map of the deliverable (AOC_map.pdf)
 - Metadata text file (013164_20170401AOC_metadata.txt)
 - GIS Deliverable (either shapefile or CAD file)
- 4) Save Zip file as 013164_20170401AOC
- 5) Start process to submit the remedial phase document via the DEP On-line service
- 6) At the Upload page, Attach the zipped GIS Submittal as Attachment Type 'GIS Site Map Including AOC Polygons (zip)'
- 7) Continue on to complete the DEP On-line service

Table 5. Example of CAD table (as shown in GIS) for the AOC / Site Boundary Deliverable shown in figure 5.

FID	Shape	Entity	Layer	AOC_ID	AOC_Type	Descript	NJDEP_ID	RefName
0	Polygon	Insert	ENV_MW					ABMWA
1	Polygon	Insert	ENV_MW					ABMWA
2	Polygon	Insert	ENV_MW					ABMWA
3	Polygon	Insert	ENV_MW					ABMWA
4	Polygon	Insert	ENV_MW					ABMWA
5	Polygon	LWPolyline	BSM_BLDG					ABMWA
6	Polygon	LWPolyline	BSM_BLDG					ABMWA
7	Polygon	LWPolyline	BSM_BLDG					BLDG
8	Polygon	LWPolyline	BSM_BLDG					BLDG
9	Polygon	LWPolyline	BSM_BLDG					BLDG
10	Polygon	LWPolyline	BSM_BLDG					BLDG
11	Polygon	LWPolyline	Site Boundary					ST_Bndry
1	Polygon	LWPolyline	AOC Boundary	AOC 1	Discharge and disposal area - Waste water treatment systems/septic/seepage pit/dry well	Former Leach Field for process waste	208899	AOC
2	Polygon	LWPolyline	AOC Boundary	AOC 2	Discharge and disposal area - Landfill	Former Process Area & former Closed Landfill	208900	AOC
3	Polygon	LWPolyline	AOC Boundary	AOC 3	Storage tank and appurtenance - Above ground storage tank	Two 2,000-gallon AST - hazardous chemicals	208901	AOC
4	Polygon	LWPolyline	AOC Boundary	AOC 4	Storage tank and appurtenance - State or Federal Regulated underground storage tank	Former gasoline UST area: two 4,000-gallon gasoline and one 2,000 gallon-gasoline USTs	208902	AOC
5	Polygon	LWPolyline	AOC Boundary	AOC 5	Other areas of concern - Electrical transformer and capacitor	Soil at former electric power yard	208903	AOC