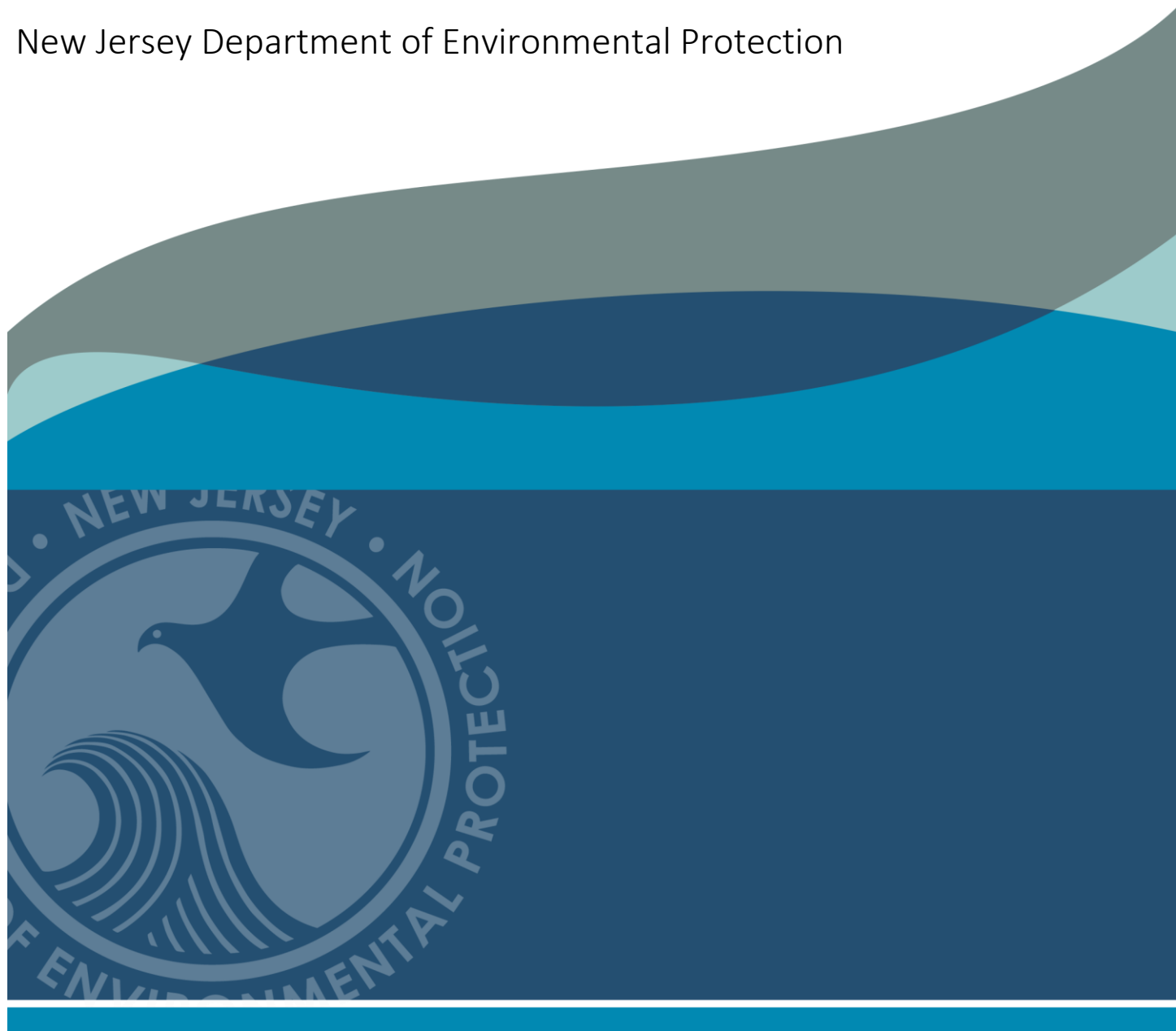


Instructions for Deed Notice GIS Submissions

GEOGRAPHIC INFORMATION SYSTEMS (GIS) INSTRUCTIONS

Contaminated Site Remediation & Redevelopment

New Jersey Department of Environmental Protection



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Instructions for Deed Notice GIS Submissions

The following document will assist a submitter to prepare a submission for a Deed Notice (DN) 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 a DN Submission.

1. Introduction

A DN, required pursuant to N.J.A.C. 7:26E-5.2(a)4, is the institutional control developed by NJDEP to limit human activities near locations where soil contamination remains at a site above the unrestricted use soil remediation standards. The Restriction Area is the boundary of the contaminated soil as documented in the DN, which is filed with the County Clerk. In certain circumstances, an Engineering Control is also established. An engineering control is any physical mechanism to contain or stabilize contamination or ensure the effectiveness of a remedial action. Engineering controls may include caps, covers, dikes, trenches, leachate collection systems, signs, fences, physical access controls, ground water monitoring systems and ground water containment systems such as a slurry walls or ground water pumping systems.

Once the DN is filed, the responsible entity will submit a [Remedial Action Permit \(RAP\) Application for Soil](#) (RAP Application for Soil), either an Initial or a Modification depending on the circumstances. The [Administrative Requirements for the Remediation of Contaminated Sites](#) (N.J.A.C. 7:26C-7.2(a)2.i.) requires the person responsible for conducting the remediation to submit a Geographic Information System (GIS) compatible map with the permit application. The GIS deliverable for a DN submittal consists of polygons that depict both the Restriction Area and Engineering Control (EC) boundaries. The polygons must be submitted as an ArcGIS shapefile or a Computer-Aided Design (CAD) dwg or dxf file.

2. GIS Submission

The GIS compatible map, which is referred to as a “*GIS Deliverable*” includes all DN boundaries that are identified in the [RAP Application for Soil](#) form. If the request is to revise an existing DN and the boundary does not change, then a DN Submission may not be required. Check NJ GeoWeb to view the DN boundary. If the DN boundary is accurately mapped in NJ GeoWeb, then a GIS Submission is not required. Section G.10. of the [RAP Application for Soil](#), if applicable, should be filled out correctly documenting that you looked on NJ GeoWeb.

If a GIS Deliverable is required, the Deliverable is not submitted with the RAP Application for Soil. It should be submitted directly to Contaminated Site Remediation & Redevelopment’s (CSRR) GIS unit using a different process. When the RAP Application for Soil is sent to CSRR, the GIS Deliverable should be attached to an email and sent to srpgis_dn@dep.nj.gov. The submitter should also attach a PDF version of the DN map to the email. The email must comply with a strict format to reconnect the GIS deliverable to the Application. The subject line and email body are used by CSRR to identify the deliverable and the acronym of DN is used to identify the submission as a Deed Notice Submission Type.

2.1 Email Subject Line

The subject line of the email should contain the Program Interest Number and Submission Type Acronym, separated by a comma.

Example: 013164, DN

2.2 Email Body (Metadata)

The required basic information about the Deliverable should be included in the body of the email. 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 could be contacted if there are GIS technical issues, and 3) the site identification information. The metadata should be included in the email as a series of fields that includes the information for the submittal. The user should copy the [metadata templates](#) from the [GIS Deliverable Templates](#) web page or fields listed in figure 1 into the email and complete the information.

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:

2.3 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).

2.4 PDF DN Map

The submitter should attach to the email a PDF version of the DN map. The information on the DN map should support the features in the GIS Deliverable, specifically the DN Boundaries and Engineering Controls.

2.5 Resubmission of failed GIS Submission

If the DN Deliverable is not acceptable, an email response to the submitter will identify the issues and how to resubmit the GIS Deliverable.

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 both the DN boundary and the engineering control boundaries, if applicable.

Generally, a restriction area boundary is the area that exceeds a soil remediation standard, and an engineering control is a physical barrier within the deed notice boundary that is designed to limit exposure to the soil contamination. In this document, a restriction area boundary feature is referred to as a ‘DN boundary’ and engineering control boundary feature is an ‘Engineering Control.’ Polygons representing the engineering control(s) will have additional information related to the construction of the barrier. The Deliverable must include the DN Boundary but including Engineering Controls is optional. The attribute values for the polygon must correspond to the information contained in the submitted form.

3.1 DN GIS Deliverable Naming Protocol

The DN 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 DN, which is the valid Submittal Type Acronym for this submission type (figure 2). If there are multiple DN submissions being submitted for the same Program Interest, then the files should be numbered sequentially [i.e., DN1, DN2, etc.].

Figure 2. Examples of the File Naming Protocol for a DN GIS Deliverable

<u>File Naming example for DN 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_20170401DN	
 <u>For multiple submissions:</u>	
013164_20170401DN1	
013164_20170401DN2	

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 DN GIS Deliverables should conform to the following structure, or schema, outlined in the [Administrative Requirements for GIS Deliverables](#).

3.3 GIS Deliverable Schema

The GIS Deliverable must show all the DN restriction area boundaries that are included in the RAP Application for Soil. The submitter may include the engineering control boundaries, if desired. All these features should be drawn as polygons and included in one deliverable. The structure, or schema, of the file should conform to the following tables depending on if the Deliverable is a shapefile or CAD file.

The GIS Deliverable supports the submittal of the RAP Application for Soil. The attribute values for the polygon must correspond to the information contained in the submitted application. For the Deed Notice boundary shape, only the Type, Descript and Depth_Ft fields need to be populated. A value is required for all fields for Engineering Control polygons, if applicable.

3.3.1 Shapefile Schema

The schema in Table 1 should be used when creating a shapefile as a DN Deliverable. The shapefile should include only the DN Boundary and Engineering Control polygons. Do not include other shapes such as Tax Parcels or streets. Problems may be caused by including additional features that are not related to the DN boundary or engineering controls in the shapefile Deliverable. The value in the Type field is used to distinguish between DN Boundary and Engineering Control polygons. For DN Boundary polygons, the value of the Layer field should be “DN Boundary” and Engineering Control polygons should be “Engineering Control.”

There are two fields that apply to both the DN Boundary and Engineering Control polygons, and they are the Descript field and Depth_Ft. The Descript field allows the submitter to provide a brief description of the DN boundary or engineering control, which will assist in the identification of the polygons. The description is not to exceed 100 characters in length. The Depth_Ft field is a positive number used to describe the minimum depth in feet below the surface at which the contamination would be encountered. The depth is for each polygon and not a depth for the entire site. For soil contamination ranging from 6 inches to 1 foot below the ground surface, the Depth_Ft value would be 0.5.

Table 1. DN 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	DN Boundary Engineering Control
Descript	Text	100	Brief description of DN boundary or engineering control	n/a
Depth_Ft	Double	-	Minimum depth of contamination in Feet for the area beneath the shape	n/a
EC_Type ①	Text	50	A description of the type of engineering control	Asphalt Cap Concrete Cap Fence Impermeable Cover Lining Permeable Cover Signage Slab Soil Other:
Thick_Ft ①	Double	-	Minimum thickness of the engineering control in Feet	n/a

Note: ① Do not complete if the Type is Deed Notice Boundary

Several fields are used to store additional information about the engineering control. The

EC_Type field describes the engineering control, or physical barrier, that restricts access to the soil contamination and could include one or more of the valid values listed in Table 1. When using ‘Other: ‘as a Type, provide a brief description of the Engineering Control. The Thick_Ft field is a positive number used to describe the minimum thickness of an Engineering Control in feet, when applicable. If two to six feet of clean fill are placed over a contaminated area as an engineering control, the Thick_Ft would be 2; however, if fencing or signage is used as the Engineering Control, the field would be left blank.

A [DN Shapefile Template](#) is available for download from CSRR’s [GIS Deliverables Templates](#) web page.

3.3.2 CAD File schema

The schema in Table 2 should be used when creating a CAD file as a DN Deliverable. The CAD file may include features other than the DN Boundary and Engineering Control polygons, but the best submittal practice is to create a CAD file that only includes the polygons associated with the RAP Application for Soil.

The value in the Layer field is used to distinguish between DN Boundary and Engineering Control polygons. For DN Boundary polygons, the value of the Layer field should be “DN Boundary” and Engineering Control polygons should be “Engineering Control.” Please do not name any other point, polyline, annotation, graphic or other map element in this way. Additional fields must be added to the CAD file to accommodate the schema for the Deed Notice Deliverable. The Descript, Depth_Ft, EC_Type, and Thick_Ft fields should be added to the CAD drawing and completed as outlined below.

Table 2. DN CAD Drawing Schema

Field Name	Type	Length	Description	Valid Values
Layer	Text	50	What the shape (feature) represents	DN Boundary Engineering Control
Descript	Text	100	Brief description of DN boundary or engineering control	n/a
Depth_Ft	Double	-	Minimum depth of contamination in Feet for the area beneath the shape	n/a
EC_Type ①	Text	50	A description of the type of engineering control	Asphalt Cap Concrete Cap Fence Impermeable Cover Lining Permeable Cover Signage Slab Soil Other:
Thick_Ft ①	Double	-	Minimum thickness of the engineering control in Feet	n/a

Note: ① Do not complete if the Type is Deed Notice Boundary

The fields that are to be completed for both the DN Boundaries and Engineering Controls are the Descript field and Depth_Ft. The Descript field allows the submitter to provide a brief description of the DN boundary or engineering control, which will assist in the identification of the polygons. The description is not to exceed 100 characters in length. The Depth_Ft field is a positive number used to describe the minimum depth in feet below the surface at which the contamination would be encountered. The depth is for each polygon and not the depth for the entire site. For soil contamination ranging from 6 inches to 1 foot below the ground surface, the Depth_Ft value would be 0.5.

Several fields are used to store additional information about the engineering control. The EC_Type field describes the engineering control, or physical barrier, that restricts access to the soil contamination and could include one or more of the valid values listed in Table 2. When using 'Other:' as a Type, provide a brief description of the Engineering Control in the Descript field. The Thick_Ft field is used to describe the minimum thickness of an Engineering Control in feet, when applicable. If two to six feet of clean fill are placed over a contaminated area as an engineering control, the Thick_Ft would be 2; however, if fencing or signage is used as the Engineering Control, the field would be left blank.

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 DN feature in the CAD drawing must be a polygon.

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 DN Deliverables for a fictitious ABC Industry site with a Preferred ID of 013164. The site has three DN Restriction Areas with four Engineering Control Areas. Restriction Area 1 contains 3 distinct engineering control areas, asphalt cap (6 inches thick), concrete cap (6 inches thick) and a soil cap (2 feet thick). Restriction Area 2 is made up of only 1 asphalt cap (6 inches thick) engineering control. The soil contamination concentration at Restriction Area 3 does not require an engineering control.

The minimum depth below the surface at which the contamination would be encountered varies depending on the Restriction Area. With Restriction Area 1, the minimum contaminant depth for the macadam parking lot (asphalt cap) is 10 feet, for the concrete cap is 20 feet, and the soil cover (soil cap) is 5 feet. The overall minimum depth for Restriction Area 1 is 5 feet. The minimum contaminant depth for the Restriction Area 2 (asphalt cap) is 2 feet and Restriction Area 3 is 10 feet. The example Deliverable was created on April 1, 2017.

4.1 Deliverable examples

If the DN is already established, then check Deed Notice Areas in NJ GeoWeb to view the DN boundary. If the DN boundary is not in NJ GeoWeb or is incorrect, then a GIS Deliverable should be submitted. If the DN boundary is already in NJ GeoWeb and is correct, then a GIS Deliverable does not have to be resubmitted, but the proper form(s) should be filled out correctly documenting that you looked on NJ GeoWeb.

4.1.1 DN Shapefile Deliverable

To complete the Deliverable, the DN shapefile template was downloaded from the web site and added to the appropriate GIS application. Seven polygon features were digitized, three DN boundaries and four Engineering Controls (figure 3). The information for these shapes were inputted into the attribute table (table 3), which is based on the information in the RAP Application for Soil.

Figure 3. Map of the Shapefile used in DN Deliverable example. There are three restriction area boundaries (Type: Deed Notice Boundary) and four engineering control boundaries (Type: Engineering Control). Restriction Area 1 has three associated Engineering controls and Restriction Area 2 has one.

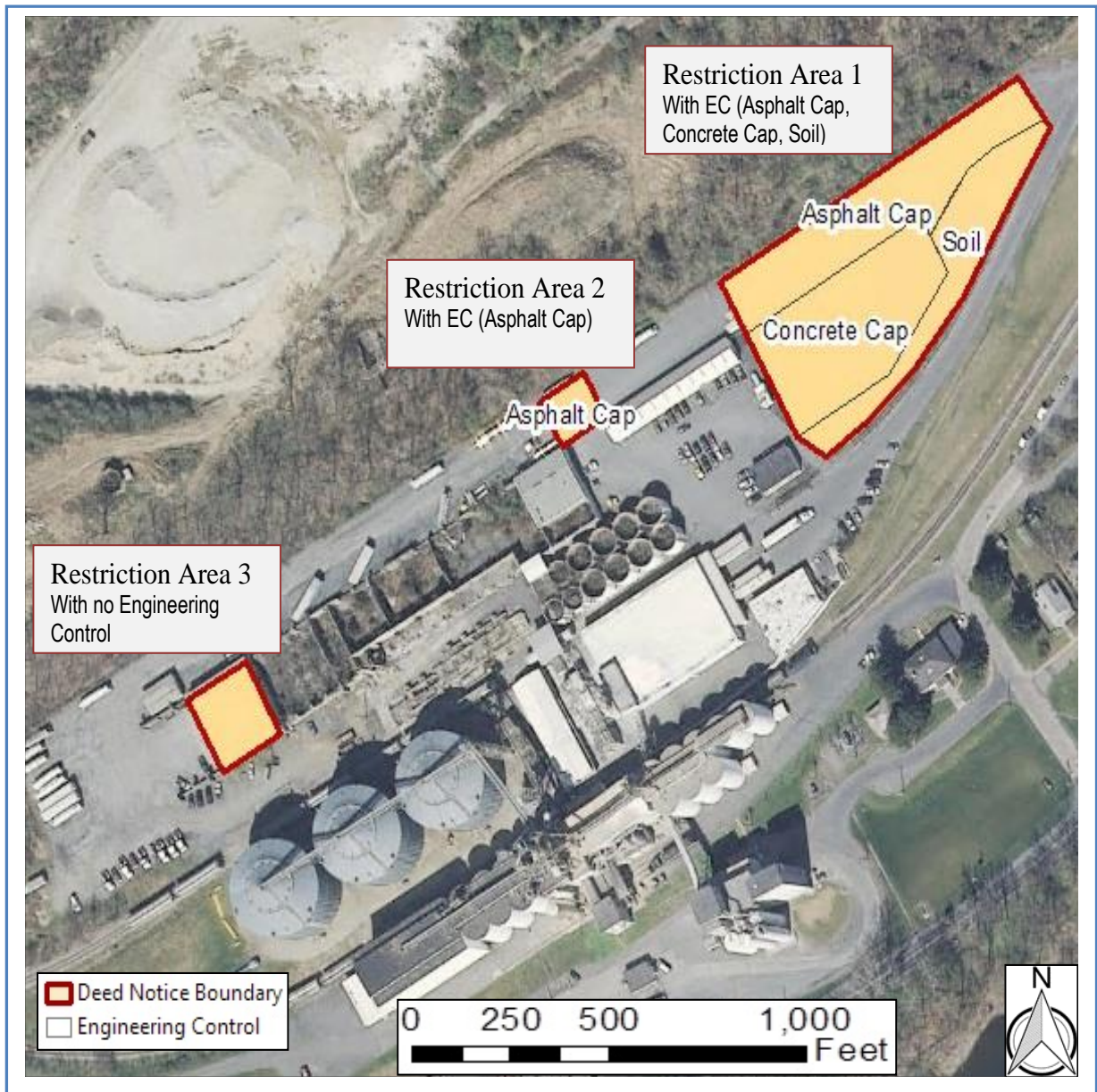


Table 3. GIS attribute table for the CEA Deliverable shown in figure 3.

FID	Shape	Type	Descript	Depth_Ft	EC_Type	Thick_Ft
0	Polygon	Deed Notice Boundary	Restriction Area 1 - Warehouse area	5		
1	Polygon	Engineering Control	Asphalt - parking lot (Area 1)	10	Asphalt Cap	0.5
2	Polygon	Engineering Control	Concrete - loading area (Area 1)	20	Concrete Cap	0.5
3	Polygon	Engineering Control	Soil cover landscaped (Area 1)	5	Soil	2
4	Polygon	Deed Notice Boundary	Restriction Area 2 - former Drum Storage Pad	2		
5	Polygon	Engineering Control	Asphalt Cap (Area 2)	2	Asphalt Cap	0.5
6	Polygon	Deed Notice Boundary	Restriction Area 3 - Maintenance shed	10		

For the restriction areas, a value of “DN Boundary” was entered into the Type field and “Engineering Control” was entered into the Type field for the polygons that represent engineering controls. The descriptions of the Deed Notices and engineering controls were inputted into the Descript field. The length of the Descript field is 100 characters, but only a short description is required. The minimum depth of the soil contamination for each polygon was entered into the Depth_Ft field. The EC_Type and Thick_Ft fields are only completed for engineering controls. The valid values for the EC_Type field are listed in the Shapefile schema in Table 1. The thickness of the engineering control is entered into the Thick_Ft field. Engineering controls that are not physical barriers, such as signage and fencing, do not have to fill in the Thick_Ft field.

Instead of downloading the DN template from the web, a user could alternatively create a shapefile from scratch following the schema presented in table 1 in a GIS application.

4.1.2 DN 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 adding the Deed Notice and Engineering Control boundary features into an existing CAD file. Additional features (polygons) other than the Deed Notice and Engineering Control boundaries are permitted in a CAD file. It is important to note that a CAD file must be georeferenced.

To complete the example CAD 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 Descript, Depth_Ft, EC_Type, and Thick_Ft.
- Add three Deed Notice boundaries and Four Engineering Controls to the CAD file (figure 4). The features must be polygons, they cannot be a series of line segments.

- Populate the fields (table 4) that are associated with the DN and Engineering Control polygons.
 - Enter the value type of polygon ‘DN Boundary’ or ‘Engineering Control’ into the layer field depending on if the polygon is a DN Boundary or Engineering Control. Since the layer field identifies the DN Boundaries and Engineering Controls, these names should be used only for those features.
 - Enter the description of the polygon into the Descript field.
 - Enter the minimum depth of the contamination in feet for the polygon into the Depth_Ft field.
 - For Engineering Control polygons only, enter the type of control into the EC_Type field. Use the values from the valid values list in Table 2.
 - Enter the thickness of the engineering control in feet in the Thick_Ft field. This is not required for engineering controls that are physical barriers, such as fencing or signage.
 - Repeat the process for each of the mapped DN Boundary and Engineering Control polygon.
- 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_20170401DN.dwg for this example)

Figure 4. Drawing of the CAD file used in the DN example. The CAD Drawing includes multiple features including the Deed Notice Boundary and Engineering Controls.

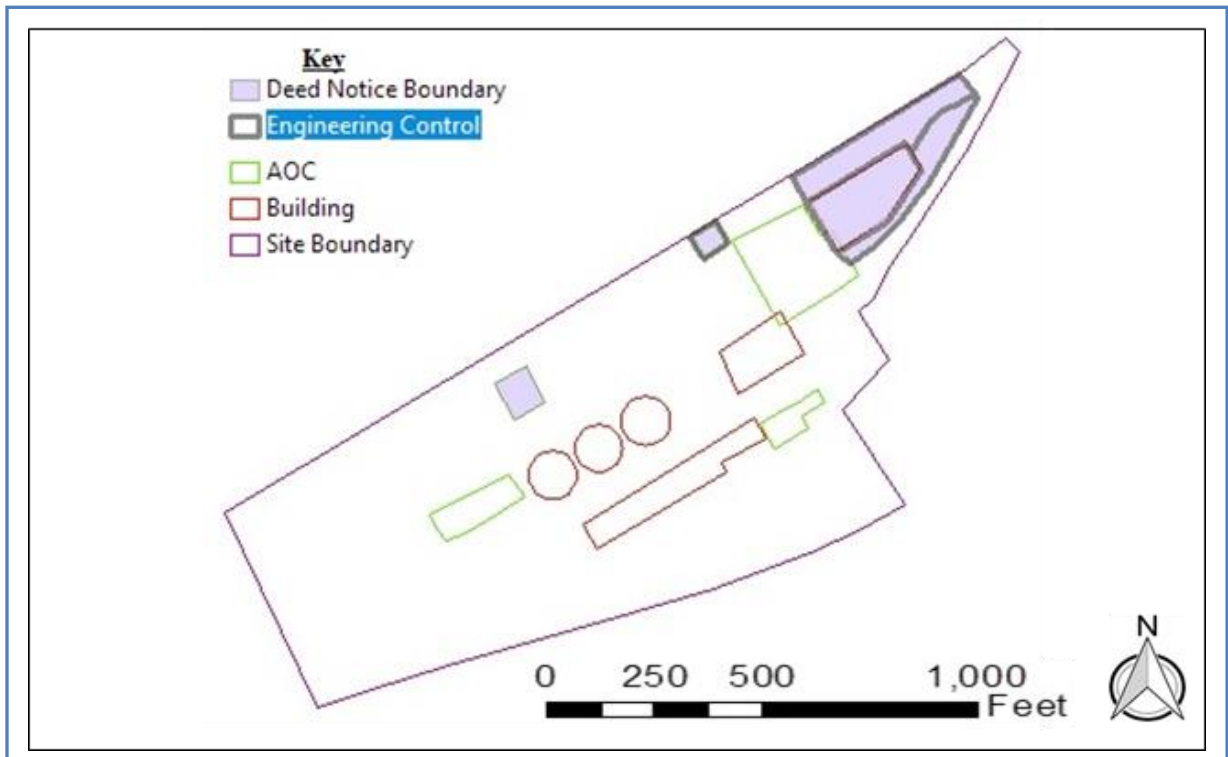


Table 4. Example of the CAD table (as shown in GIS) for the CEA shown in figure 4.

FID	Shape	Entity	Layer	Descript	Depth_Ft	EC_Type	Thick_Ft	RefName
1	Polygon	Insert	ST_BNDRY					ABMWA
2	Polygon	Insert	ENV_AOC					ABMWA
3	Polygon	Insert	ENV_AOC					ABMWA
4	Polygon	Insert	ENV_AOC					ABMWA
5	Polygon	Insert	ENV_AOC					ABMWA
6	Polygon	Insert	ENV_AOC					ABMWA
7	Polygon	Insert	ENV_AOC					ABMWA
8	Polygon	LWPolyline	BSM_BLDG					BLDG
9	Polygon	LWPolyline	BSM_BLDG					BLDG
10	Polygon	LWPolyline	BSM_BLDG					BLDG
11	Polygon	LWPolyline	BSM_BLDG					BLDG
12	Polygon	LWPolyline	BSM_BLDG					BLDG
13	Polygon	LWPolyline	DN Boundary	Restriction Area 1 - Warehouse area	5		0	DN_DN
14	Polygon	LWPolyline	Engineering Control	Macadam parking lot (Area 1)	10	Asphalt Cap	0.5	DN_EC
15	Polygon	LWPolyline	Engineering Control	Concrete slab - loading area (Area 1)	20	Concrete Cap	0.5	DN_EC
16	Polygon	LWPolyline	Engineering Control	Soil cover landscaped (Area 1)	5	Soil	2	DN_EC
17	Polygon	LWPolyline	DN Boundary	Restriction Area 2 - Former Drum Storage Pad	2			DN_DN
18	Polygon	LWPolyline	DN Boundary	Restriction Area 3 - Maintenance shed	10			DN_DN
19	Polygon	LWPolyline	Engineering Control	Asphalt Cap (Area 2)	5	Asphalt Cap	2	DN-EC

4.2 Submittal (email)

Once the GIS Deliverable is created and RAP Application for Soil has been submitted, the Deliverable should be submitted to CSRR through the following steps:

- 1) Open email,
- 2) Attach the GIS Deliverable (either shapefile or CAD file) to the email,
- 3) Attach the PDF map of the DN,
- 4) Fill out the subject line correctly ('013164, DN' for this example),
- 5) Copy the metadata section into the email and complete as needed, then
- 6) Email to srpgis_dn@dep.nj.gov

A completed email for this fictitious ABC Industry site is shown in figure 5.

Figure 5. Example of email sent to CSRR. The attached Deliverable is a shapefile.



The screenshot shows an email composition interface. At the top left is a 'Send' button with a paper plane icon. To its right are 'To' and 'Cc' fields. The 'To' field contains the email address srpgis_dn@dep.nj.gov. Below these fields is a 'Subject' field containing the text '013164, DN'. Underneath the subject field is a list of attachments: '013164_20170401CEA.shp' (484 bytes), '013164_20170401CEA.shx' (116 bytes), '013164_20170401CEA.dbf' (300 bytes), '013164_20170401CEA.prj' (479 bytes), and 'DN_map.pdf' (54 KB). Below the attachments is a large text area containing the following metadata:

Program Interest Number for Site: 013164
Activity Number: LSR200001
Name of Site as known to NJDEP: ABC Industry
Street address of Site: Main St
Municipality of Site: Town
County of Site: County
Submission Type Acronym: DN
Submission Description: revised DN (April 2017) for ABC Industry
Name of LSRP (or consultant) overseeing work: Jane Doe
LSRP's license number: 0000000
LSRP's Email Address: Jane.Doe@provider.com
Name of GIS author Company: GIS Firm
Mailing address: 1 Main St, Newark NJ 08000
Name of Professional performing GIS work: John Doe
Email for Professional performing GIS work: John.Doe@provider.com
Phone Number for Professional performing GIS work: (609) 000-0000