

Superfund Geodata Starter Kit

Quick Reference Guide



Key Files



Data_Dictionary

This folder contains the data dictionary "Superfund_GeoData_Dictionary_v5.2.pdf" which defines the data elements and specifications for standardized Superfund geospatial vector data. The fields denoted by "HQ" in the source column are to have their data values supplied by SEMS and are not to be completed by regional GIS personnel.



Subtypes and Domains

This folder contains the attribute domain tables used for the point, line, and polygon template feature classes. These attribute domains contain the valid values for specific data fields and are already loaded and connected to the geodatabases that are included as part of this kit. All domains except for the SITE FEATURE TYPE should remain static and not be modified. ***The SITE FEATURE TYPE may have values added to it as necessary to accommodate data received and managed by regions.***

SITE FEATURE TYPE domains are organized under SITE FEATURE CLASS subtypes in "SITE_FEATURE_CLASS_subtypes.xlsx" within the Domains folder. Feature Type domains are limited by Feature Class subtype.



Script

This folder contains a python script called UpdateSEMSattributes.pyt. This script will update regional feature classes with the attribute values from the SEMS web service. The script will work for both enterprise and file geodatabases and requires each region to set the variables at the beginning of the script to the appropriate values for their region. For assistance contact in implementing this script please contact OSRTI Information Management Branch Program Analyst, Kelsey Whalen, at whalen.kelsey@epa.gov.



Template_Geodatabases

This folder contains two geodatabases with empty feature classes that were created using the standard schema defined in the data dictionary. The feature classes may be copied, renamed if needed, and have data loaded to them to help simplify and standardize how Superfund data are managed throughout EPA. ***The feature classes are in Geographic Coordinate System, Decimal Degrees, WGS84 Datum.***

Superfund_Geodata_Template.gdb

This geodatabase contains template point, line and polygon feature classes that serve as foundational feature classes for creating schema-compliant data.



SUPERFUND_TEMPLATE_LINES

SUPERFUND_TEMPLATE_POINTS

SUPERFUND_TEMPLATE_POLYGONS

Superfund_Recommended_FeatureClasses.gdb

This geodatabase contains recommended feature classes for managing certain features that should be common to all regions. Organizing these data into these feature classes will allow for a more seamless creation of national datasets. Although the feature class names are optional, it is strongly recommended that regions use this common approach and schema for managing the type of features specified in the feature class names, such as site boundaries, operable units, institutional controls, etc.



IC_BOUNDARIES_SF

Institutional controls (ICs) are “Non-engineered instruments, such as administrative and legal controls, that help to minimize the potential for exposure to contamination and/or protect the integrity of a response action. ICs typically are designed to work by limiting land and/or resource use or by providing information that helps modify or guide human behavior at a site.”

Institutional Controls: A Guide to Planning, Implementing, Maintaining and Enforcing Institutional Controls at Contaminated Sites;” Office of Solid Waste and Emergency Response [OSWER] Directive 9355.0-89; Dec 2012

Generally, an IC polygon should represent the perimeter of an area subject to site ICs. The collection of geospatial data about the location of ICs is recommended whenever practicable. The IC polygon name should be the same as the IC names entered into SEMS, and the polygon description should match the IC type specified in SEMS.



OU_BOUNDARIES_SF

The operable unit (OU) polygons represent an individual OU’s perimeters, which are used to identify a portion of a Superfund site with which assessment and response actions are associated. CERCLA regulations (40 C.F.R. § 307.14) define an OU as a “discrete portion of a remedial response [that] manages migration, or eliminates or mitigates a release, threat of release, or pathway of exposure. The cleanup of a site can be divided into a number of operable units . . . [that] may address geographical portions of a site.” Determined on a site-specific basis, OUs may represent distinct geographic areas, media or releases. Note that OUs may overlap geographically when representing distinct media or areas of concern.



SITE_BOUNDARIES_SF

The total site polygon represents the footprint of the whole site. EPA site documents reflect varying approaches to the delineation and presentation of boundaries among the Regions and over time. One of the four boundary definitions, included in Appendix A, should be chosen for each site and entered into the FEATURE TYPE field. For more information on defining site boundaries, see Appendix A.



SITE_FEATURE_LINES_SF

Any site feature represented as a line. The SITE_FEATURE_TYPE field should be used to specify the type of feature.



SITE_FEATURE_POINTS_SF

Any site feature represented as a point. The SITE_FEATURE_TYPE field should be used to specify the type of feature.



SITE_FEATURE_POLYS_SF

Any site feature represented as a polygon that is not a boundary. The SITE_FEATURE_TYPE field should be used to specify the type of feature.

Change Log

These changes were made to version 5.1 of the starter kit to create version 5.2:

- "CLEARED_PUBLIC_RELEASE" updated to internal use only field.
- "Site boundary -" prefix removed from "SITE_FEATURE_TYPE_5" domains.
- UpdateSEMSAttributes.pyt updated to most current version.

These changes were made to version 5 of the starter kit to create version 5.1:

- Removed default values from "SITE_FEATURE_CLASS" field.
- "SF_GEOSPATIAL_DATA_DISCLAIMER" changed from domain field to default value field.
- Field length for "SF_GEOSPATIAL_DATA_DISCLAIMER" updated to 2000 characters.
- Field length for "SITE_FEATURE_DESCRIPTION" updated to 2000 characters.
- Field length for "RPM_APPROVAL" updated to 3 characters.
- Field length for "ADDR_COMMENT" updated to 1000 characters.
- Field length for "PROJECTION" updated to 250 characters.
- Field length for "GIS_AREA_UNITS" updated to 25 characters.
- Field length for "GIS_LENGTH_UNITS" updated to 25 characters.
- Updated "LAST_CHANGE_DATE" and "ORIGINAL_CREATION_DATE" to allow null values.
- Field order updated in "Superfund_GeoData_Dictionary_v5.1" file to match template geodatabases.
- Filled in missing domains in SITE_FEATURE_CLASS_subtypes.xlsx.
- Matched domains in SITE_FEATURE_CLASS_subtypes.xlsx to template geodatabases.
- Removed unneeded domain files for "SITE_FEATURE_CLASS" and "SITE_FEATURE_TYPE" fields.
- Added "Subtypes Fact Sheet" file.

These changes were made to version 4 of the starter kit to create version 5:

- Field order updated.
- Updated the "SITE_FEATURE_TYPE" domain field to include additional entries, including:
 - Adit, EC Not Yet in Place, Groundwater EC Boundary, Non-groundwater EC Boundary, IC Not Yet In Place, Proprietary IC Boundary, Governmental IC Boundary, Informational Devices IC Boundary, Enforcement and Permit Tools IC Boundary, Parcel, Park, Surface Water – Natural, Well – Other, Well – Monitoring, Well – Extraction, Well – Injection, Well – Private, Well – Abandoned, Reuse Feature, OU Boundary Aggregation, Current Ground Boundary, Comprehensive Site Area, Extent of Contamination.
- Updated the "SITE_FEATURE_CLASS" domain field to include additional entries, including:
 - Site Point, Site Line, Site Polygon.
- Added subtypes to the "SITE_FEATURE_CLASS" field. "SITE_FEATURE_TYPE" domains are now specific to the "SITE_FEATURE_CLASS" subtype.
- "RPM_APPROVED" field added.
- "SF_GEOSPATIAL_DISCLAIMER" field added.
- "SITE_ID" field added.
- "GIS_PROJECTION" field added.
- ***UpdateSEMSattributes.pyt*** was added to replace the previous script that was used with ArcGIS Pro, Python 3.x, ArcMap and Python 2.7. The script is now a Python Toolbox that can be used with either ArcGIS Pro or ArcMap/ArcCatalog and queries the public SEMS API.
- Field length for "SITE_FEATURE_NUMBER" updated to 50 characters.
- Field length for "SITE_FEATURE_NAME"- updated to 150 characters
- Field length for "FEATURE_INFO_URL_DESC" updated to 20 characters.
- Data type for REGION_CODE updated to short.
- Date type for SITE_FEATURE_CLASS updated to short.
- Data type for HORIZ_COLLECT_METH_CODE updated to short.
- Data type for TIER_ACCURACY_CODE updated to short.

Appendix A. Boundary Types

OU Boundary Aggregation (also known as Total Site Polygon)

The total site polygon represents the footprint of a whole site, defined for purposes of this document as the sum of all of the OUs and the current understanding of the full extent of contamination. As site investigation and remediation progress, OUs may be added, modified or refined, and the total site polygon should be updated accordingly.

- Note: An approach to boundary development that relies on the definition of spatial boundaries for OUs is complicated by the varying approaches to defining OUs, which are not always spatially distinct. For example, some OUs are media-specific (e.g., groundwater and soil), while others are location-specific (e.g., the former facility area and the residential area). For example, the Westinghouse Electric Corp. (Sharon Plant) Superfund site has two OUs. OU1 is soil. OU2 is groundwater and sediments. The areas where soil was excavated overlap the physical location of the technical impracticability waiver for groundwater, which make it challenging to map by OU.

Current Ground Boundary

Some maps in Superfund site documents delineate the site boundary as the site's ground boundary. However, they do not show the spatial boundaries of surface water areas or groundwater contamination.

Comprehensive Site Area

The definition of the total site polygon above would allow for removal of parcels and OUs from a boundary definition. In contrast, a comprehensive site area boundary would include the full extent of any areas ever been considered part of a site, including areas added or deleted over time as well as surface water features and groundwater contamination. Identifying such a boundary involves review of all site Records of Decision, Amended Records of Decision and Explanations of Significant Differences as well as the most recent Five-Year Review Report. In some cases, additional information will be needed.

Extent of Contamination

Polygons of a site's extent of contamination represent areas of contaminated media, as identified during site investigations and as refined as the cleanup proceeds.

Updated August 2023