

CHAPTER 6: DATA MANAGEMENT AND RECORDKEEPING

PART OF THE SOURCE CONTROL (BUSINESS/SITE) INSPECTION PROGRAM GUIDANCE MANUAL

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Note:

Some pages in this document have been purposely skipped or blank pages inserted so that this document will print correctly when duplexed.

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6. DATA MANAGEMENT AND RECORDKEEPING

This chapter summarizes the National Pollutant Discharge Elimination System (NPDES) Municipal Stormwater permit requirements for data management and recordkeeping and provides recommendations for developing and maintaining a centralized database, annual reporting requirements for the Washington State Department of Ecology (Ecology), data collection and updates, and source control inventory updates. Supplemental resources to support this chapter can be found in the [Source Control Online Resource Library \(SCORL\) for Chapter 6](#).

6.1. PERMIT REQUIREMENTS

This chapter provides detail on processes to maintain a source control inspection program database over time, and to efficiently document compliance with the NPDES Municipal Stormwater permit requirements. The following recordkeeping requirements are specified in the NPDES Municipal Stormwater permit for a progressive enforcement policy (Western Washington 2019-2024 Phase II Permit, S5.C.8.b.iv):

(c) Each Permittee shall maintain records, including documentation of each site visit, inspection reports, warning letters, notices of violations, and other enforcement records, demonstrating an effort to bring sites into compliance. Each Permittee shall also maintain records of sites that are not inspected because the property owner denies entry.

See [Chapter 4: Developing a Business/Site Inspection Program](#) and [Chapter 5: Conducting Business/Site Inspections](#) for more information on developing an inspection program and conducting inspections for business/sites.

The NPDES Municipal Stormwater permit also requires recordkeeping for staff training activities (Western Washington 2019-2024 Phase II Permit, S5.C.8.b.v):

(v) ...Permittees shall document and maintain records of the training provided and the staff trained.

See [Chapter 8: Training](#) for more information about required training activities.

6.2. DEVELOPING AND MAINTAINING A CENTRALIZED DATABASE

Each jurisdiction will have unique needs for data management to support internal tracking and processes. A centralized database is generally recommended to house the source control inventory and to track activities associated with each business/site over time. For more information on how to develop an initial source control inventory, see [Chapter 3: Source Control Inventory Development, Updates, and Prioritization](#).

Within a centralized database, each business/site has a unique ID and associated “record” that can be used to track several attributes about the business/site. Ideally, related files (such as photos, inspection documents, or correspondence) can then be attached or linked to the primary record. Note: More than one business could be located on a parcel, so using a parcel number may not result in a unique ID for each business, but is still useful to record as a business/site attribute.

The NPDES Municipal Stormwater permit does not specify a format or approach for recordkeeping. If a jurisdiction is already using a data management system, it may be most efficient to fold the source control inspection documentation into the existing system to enable consistent processes across the organization.

If a new system is needed, the most basic set-up for the source control inventory is a Microsoft Excel list of businesses/sites that can be matched (using a unique ID, hyperlinks, etc.) to an individual folder containing all related files for that site. While this set-up may be the most readily accessible and quickest to implement, there are several limitations to consider for inspector workflows and integration with other software. For this reason, jurisdictions may want to consider implementation of a more advanced system. See Table 6.1 for advantages and disadvantages of various database options. Note that options listed in this manual do not constitute a requirement or recommendation for proprietary software.

A GIS or other map-based approach is recommended because there are advantages and efficiencies that can be attained using spatial information. A map-based inventory supports the following inspection program activities:

- Locating businesses
- Planning business inspections around clusters of businesses
- Identifying priority areas (e.g., proximity to receiving waters)
- Identifying pollution problems within a specific geographic area or subbasin, if applicable in the jurisdiction’s prioritization process – see [Chapter 3: Source Control Inventory Development, Updates, and Prioritization](#)

Table 6.1. Source Control Inventory Database Options.

Data Storage Platform for Sites/Businesses	Advantages	Disadvantages
Existing System		
Existing Data Management System	<ul style="list-style-type: none"> ● Already configured ● Maintain consistent processes across programs/departments ● Current staff may already be familiar with system interface and processes ● Information Technology (IT) is familiar with existing software 	<ul style="list-style-type: none"> ● May constrain or limit specific needs for the source control inspection program if these do not fit within the existing system structure/processes
New System Basic Option – Limited Functionality		
Microsoft Excel (or similar spreadsheet software)	<ul style="list-style-type: none"> ● Already available to most municipalities ● Readily accessible, easy to use for most staff, and easy to share/export/summarize ● Capabilities (via Mail Merge) for auto-generating correspondence/letters 	<ul style="list-style-type: none"> ● Limited spatial integration for tracking business/sites in map format ● Limited integration with online/mobile application workflows for field inspections and dynamic edits
New System Advanced Options		
ESRI File Geodatabase ^a (with ArcGIS Online Hosted Feature Service) Alternate Option: Open-Source GIS software (QGIS) ^a	<ul style="list-style-type: none"> ● Full spatial integration to view and track businesses/sites in map format that can be shared with non-GIS users ● Integration with online/mobile application workflows for field inspections and dynamic edits ● Web interface is accessible for non-GIS users or those without a desktop license ● Can be exported to Excel/comma separate value (CSV) format for reporting ● Capabilities for generating batched correspondence/letters based on database inputs ● Can be integrated with Off-the-Shelf Providers for hybrid workflow 	<ul style="list-style-type: none"> ● Requires knowledgeable GIS staff for setup and support ● High license cost for jurisdictions that don't already have a GIS license ● Limited desktop access for unlicensed users (*see Advantages for web interface vs. desktop license) ● Custom configuration is required to launch a full inspection program; workflows are not built-in (e.g., for managing correspondence with responsible parties)
Proprietary System (off-the-shelf providers) ^b	<ul style="list-style-type: none"> ● <i>*Subject to specific capabilities of the provider</i> ● Pre-built workflows for tracking inspection status, often customizable ● Pre-built workflows for managing correspondence, notifications, and follow-up ● Can often be integrated with GIS applications to take advantage of spatial functionality and mobile applications 	<ul style="list-style-type: none"> ● Additional cost of implementation fees and annual licensing, in addition to staff training ● IT support/approval for new software package; must confirm compatibility with other platforms already in use ● Customization capabilities may be constrained, depending on provider

^a Open-source geographic information system (GIS) software (QGIS) is also available for jurisdictions without a desktop Environmental Systems Research Institute (ESRI) license. QGIS capabilities (e.g., for hosting data online or access to mobile apps) were not explored in detail and do not necessarily meet all listed advantages.

^b Detailed review of available proprietary systems and features is outside the scope of this manual. Advantages are assumed based on available demonstrations for various proprietary system options.

A variety of proprietary systems are available, including but not limited to NPDES program management software, inspection tracking systems, asset management systems, complaint/request management systems, and other work order or task management systems. Different systems have various strengths and may have differing levels of compatibility with other programs. Based on feedback collected from Phase I permittees, asset-based configuration can be difficult for implementing a source control inspection program focused on entire sites, rather than individual assets.

For the [Business Inspection Group \(BIG\) Report](#), four vendors provided demonstrations of proprietary system options for implementation and data management of a source control inspection program. Those presentations are included as [SCORL Supplemental Resources 6A through 6D](#).

Jurisdictions should consider data management systems used successfully by other programs/departments to determine if existing software can support the source control inspection program. For example, some jurisdictions may already have an Illicit Discharge Detection and Elimination (IDDE) data management system in place that could support the needs of the source control inspection program, since both NPDES Municipal Stormwater permit requirements include inspection and enforcement elements. When deciding to develop a system internally or when comparing potential vendors for proprietary systems, the following functions and/or features should be considered:

- Customizable workflows and terminology adaptable to the local jurisdiction
- Compatibility for incorporating multiple NPDES Municipal Stormwater permit requirements (e.g., illicit discharge field screening, outfall inspections, etc.)
- Customizable staff access to meet various needs (i.e., administrative roles versus inspector roles)
- Capability for connecting or importing data from existing programs or other sources (for example, existing maintenance data, existing list of sites or site contacts in spreadsheets, complementary inspections such as Fats, Oils, and Grease (FOG) or IDDE that have occurred at the business/site, or data from other software applications)
- Integration with ESRI ArcGIS (or other geospatial software) for map utilization/display, data access, and mobile application utilization
- Mobile app access or integration with partner mobile applications to facilitate field data collection and online synced database revisions based on inspector dynamic inputs, or offline data entry that can be synced when internet connection is available
- Correspondence automation and tracking (e.g., auto-generation of correspondence based on inspection outcomes, notices sent/received to responsible party, etc.)

- Graphical dashboard interface for high-level tracking of progress and goals (e.g., percent of annual site inspections completed)
- User-friendly report generation, both site-specific and year-end reporting compatible with Ecology requirements
- Support for system launch and setup, including training for staff and implementation/data integration services, plus ongoing technical support

6.3. ANNUAL REPORTING TO ECOLOGY

Source control inventory development and data management should support efficient annual reporting. The following questions are currently included in annual reporting to Ecology related to the source control inspection program (Western Washington 2019–2024 Phase II Permit, Appendix 3).

Annual Report Question #	2019–2024 Phase II Permit Reference	Question	Answer Format	Supported by Data Management System
73	S.5.C.8.b.i	Adopted ordinance(s), or other enforceable documents, requiring the application of source control BMPs for pollutant generating sources associated with existing land uses and activities per S.5.C.8.b.i. Cite ordinance in Comments field. (Required by August 1, 2022)	Yes/No <i>*Cite ordinance</i>	
74	S5.C.8.b.ii	Established an inventory per S5.C.8.b.ii. (Required by August 1, 2022)	Yes/No	
74a	S5.C.8.b.ii	Number of total sites identified for the inventory	Number (i.e., 1500)	X
75	S5.C.8.b.iii	Implemented an inspection program per S5.C.8.b.iii. (Required by January 1, 2023)	Yes/No	
76	S5.C.8.b.iv	Implemented a progressive enforcement policy per S5.C.8.b.iv. (Required by January 1, 2023)	Yes/No	
77	S5.C.8.b.iii and S5.C.8.b.iv	Attach a summary of actions taken to implement the source control program per S5.C.8.b.iii and S5.C.8.b.iv.	Attachment	
78	S5.C.8.b.iii	Attach a list of inspections, per S5.C.8.b.iii, organized by the business category, noting the number of times each business was inspected and if enforcement actions were taken.	Attachment	X
79	S5.C.8.b.v	Implemented an ongoing source control staff training program per S5.C.8.b.v?	Yes/No	

One additional question is included in the annual report for Phase I jurisdictions (2019-2024 Phase I Permit, Appendix 3).

Annual Report Question #	2019–2024 Phase I Permit Reference	Question	Answer Format	Supported by Data Management System
45	S5.C.8.b.ii	Updated inventory to identify commercial and industrial properties which have the potential to generate pollutants to the Permittee’s MS4 per S5.C.8.b.ii? (required once every five years.)	Yes/No	

Note: Jurisdictions should also provide programmatic updates in their Stormwater Management Program (SWMP) Plans which are required to be submitted with the annual report.

6.4. DATA COLLECTION AND UPDATES

The majority of data collection will occur in the field during inspections. For jurisdictions that use mobile applications and database syncing, database updates, and corrections can also occur in the field. An example template for a source control inspection form are included in the [SCORL Supplemental Resources for Chapter 5](#). The template is intended to be customizable for local jurisdictions. Regardless of the particular questions that a jurisdiction chooses to include on their inspection forms, the following general recommendations apply to data collection and updates:

- Consider electronic forms for inspectors to support use of mobile applications on field laptops/tablets. Mobile applications can support synced access to a master database and allow pre-population of known site information. This also allows field edits to be incorporated in real time, rather than entered into the data management system after an inspection.
- Constrain data entry using domains (e.g., dropdown menus or pre-set choices) to ensure consistency across users, avoid typos, support sorting/filtering functionality, and to promote faster/easier data entry in any interface (desktop or mobile applications).
- Consider reporting/exporting needs when developing inspection forms.

6.5. SOURCE CONTROL INVENTORY UPDATES

As discussed in [Chapter 3: Source Control Inventory Development, Updates, and Prioritization](#), it may be beneficial to update the source control inventory once per NPDES Municipal Stormwater permit term or more frequently (e.g., continually or on an annual basis) to address new, relocated, or closed businesses. The 2019-2024 Phase I Permit requires an inventory update once per permit term (every 5 years) and the Western Washington 2019-2024 Phase II Permit does not specify a frequency for source control inventory updates.

Inventory refinements and adjustments to remove or re-classify businesses/sites will ideally occur throughout the inspection process when inspectors visit a business/site. Use of mobile applications can allow the inspector to access and update existing site information in real time.

A database tag for site tracking (distinct from compliance and/or inspection tracking) is recommended for data management purposes and can be incorporated into the site database and associated inspection form. The following proposed tracking status field is included in the example source control inspection form included in [Chapter 5: Conducting Business/Site Inspections](#).

Tracking Status Tag	Implementation Notes
Pending Confirmation	Placeholder status until business/site has had an initial inspection or is otherwise visually confirmed (e.g., windshield survey, Google Street View, etc.)
Active – Location Confirmed	Primary status for confirmed active sites in the source control inventory
Active – Mobile Business	Special designation for active mobile businesses that may not have a fixed business location
Business Relocated – Revise in Mapping	Action required. Move map point to correct location and revise address notes as needed. When updates are complete, revise status to “Active – Location Confirmed”
No Pollution-Generating Activities on Site	Maintain in database as an inactive archive record – exclude from source control inventory
Business Closed	Maintain in database as an inactive archive record – exclude from source control inventory
New Business – Flag for Future Inventory Update	Hold in database for next formal source control inventory update

New businesses/sites can be added to the source control inventory in the field or in the office (through a desktop assessment):

- **Field Evaluation:** Inspectors should have functionality in their mobile applications to add a new business if they encounter one while driving to or visiting an inventoried business/site. Note that adding new businesses/sites will not change the initial inventory count for the 20 percent inspection requirement. These businesses/sites can be added to the database for future reference, but held separate from the established source control inventory count.
- **Desktop Assessment:** Source control inventory updates can be made on a rolling or periodic basis in the office using the data sources listed in [Chapter 3: Source Control Inventory Development, Updates, and Prioritization](#) (e.g., new water service accounts, ESRI Business Analyst, etc.). The approach to add new businesses will vary depending on how the initial inventory was developed and selected data sources for updating the inventory.

The permit also requires inspection of 100 percent of sites identified through legitimate complaints. Depending on their software configuration, some jurisdictions may benefit from integrating their community engagement or request management systems (or whatever other

systems are used to process public complaints) with their source control inspection system. Complaint data should be easily accessible to staff that are planning and carrying out inspections. A placeholder tag to flag complaint sites is included in the example source control inspection form included in [Chapter 5: Conducting Business/Site Inspections](#).