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SUCCESSFUL MUNICIPAL SEPARATE STORM SEWER SYSTEM PROGRAMS IMPLEMENTED IN THE NAVY—NESDI #494

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14. ABSTRACT

This project produced findings and recommendations that can be used by naval installations as lessons learned for complying with municipal separate storm sewer system (MS4) regulatory requirements. An evaluation of business practices that currently MS4 permitted naval installations use performed. comply with municipal separate storm sewer system (MS4) regulatory requirements. The purpose of this project is to provide naval installations not yet permitted with numerous methods employed to achieve compliance with MS4 permits. Technologies and methodologies were compiled into a small database, and existing templates were uploaded onto the Navy Environmental Management Ssystem (EMS) Web. With the current budget constraints, the most viable option would be a combination of EMS Web, generic spreadsheet software or pen/paper in an organized manner. In the long-term, a comprehensive electronic methodology is recommended to keep data organized, be more efficient and to keep up with regulations. Commercial off-the-shelf technologies exist but pose security risks because they are web-based applications. The Marine Corps has access to e-SWPPP, which is a web-based application that integrates GIS with MS4 permitting. e-SWPPP resides on the CITRIX server but is currently not available to the Navy. The application seems promising for Navy use, and the feasibility and viability of using it is worth exploring.

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Naval Facilities Engineering Command

Navy Environmental Sustainability Development to Integration Program

SUCCESSFUL MUNICIPAL SEPARATE STORM SEWER SYSTEM PROGRAMS IMPLEMENTED IN THE NAVY

NESDI #478

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EXECUTIVE SUMMARY

Most Navy installations operate under individual or general stormwater National Pollutant Discharge Elimination System (NPDES) permits. However, it is expected in the future that state regulatory agencies will require most Navy installations to operate under Municipal Separate Stormwater Sewer System (MS4) permits. Many bases in the west coast have only recently been issued MS4 permits such as Naval Base San Diego, Naval Air Station Lemoore and Naval Base Kitsap. After Naval Base San Diego received its MS4 permit, they have to meet the requirements for both MS4 and industrial permits. The challenge of complying with both permits is the increased number of requirements (such as the six control measures and managing inspections and record keeping) to fulfill with limited staff. Naval Facilities Engineering Command Southwest (NAVFAC SW) submitted a Navy Environmental Sustainability Development to Integration (NESDI) need requesting assistance to determine best methods in complying with MS4 permits.

NAVFAC Engineering and Expeditionary Warfare Center (EXWC) responded to the need and contacted several public agencies as well as Navy installations to determine how agencies and installations are complying with their MS4 permits. The results were compiled into a table and are included in Section 2.1. In addition, spreadsheet templates used for inspections and examples of posters, brochures, etc. for the six (6) control measures were uploaded to the Navy's Environmental Management System (EMS) Web. The resources are available for stormwater personnel who want examples on how to comply with the six (6) control measures or want examples of the spreadsheets used to monitor inspections and illicit discharges.

The intent of this project was to provide users with numerous methods of managing MS4 permits. Stormwater personnel would then select the most appropriate methodology or technology. However, after contacting several Navy installations and public agencies, the following are viewed as the most cost effective alternatives employed by installations with no specific priority:

a. EMS Web
b. Spreadsheet software
c. Pen/paper
d. Contract the work

With the current budget constraints, the most viable option would be a combination of EMS Web, generic spreadsheet software, or pen/paper in an organized manner. In the long-term, a comprehensive electronic methodology is recommended to keep data organized, be more efficient and to keep up with regulations. Commercial off-the-shelf technologies exist but pose security risks because they are web-based applications. The Marine Corps has access to e-SWPPP, which is a web-based application that integrates GIS with MS4 permitting. e-SWPPP is housed on the CITRIX server but is currently not available to the Navy. NAVFAC Southeast is considering this option as potentially suitable for use at bases that have BOSC implementing MS4 requirements. The application seems promising for Navy use, and the feasibility and viability of using it is worth exploring.

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ACRONYMS AND ABBREVIATIONS

BOSC	Base Operating Support Contract
BOSS	Base Operating Support Services
BMP	Best Management Practice
DCO	Defense Connect On-line
EMS	Environmental Management System
EPA	Environmental Protection Agency
e-SWPPP	Electronic Stormwater Prevention Pollution Plan
EXWC	Engineering and Expeditionary Warfare Center
FEAD	Field Engineering & Architecture Department
JEB	Joint Expeditionary Base
MCB	Marine Corps Base
MS4	Municipal Separate Storm Sewer System
MWR	Morale Welfare and Recreation
NAS	Naval Air Station
NAVFAC	Naval Facilities Engineering Command
NB	Naval Base
NESDI	Navy Environmental Development Sustainability to Integration
NMCI	Navy Marine Corps Intranet
NPDES	National Pollutant Discharge Elimination System
NS	Naval Station
NSA	Naval Support Activity
PAO	Public Affairs Office
SQL	Structured Query Language
SWMP	Storm Water Management Plan

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1.0 INTRODUCTION

1.1 BACKGROUND

A Municipal Separate Storm Sewer System (MS4) is a stormwater conveyance system typically owned by the public and is not part of a publicly owned treatment work. For example, storm sewer lines on school campuses, parks, hospitals etc. Regulatory requirements vary from state to state on requirements for management of a MS4. Often, a National Pollutant Discharge Elimination System (NPDES) permit must be obtained by the operator of an MS4, which can include military installations. The primary goal of MS4 permits is to improve water quality by reducing pollutants in stormwater discharges. On 8 December 1999, United States Environmental Protection Agency (EPA) issued regulations known as Phase II, requiring MS4 permits for stormwater discharges from small MS4s and from construction sites disturbing between 1 and 5 acres of land in urbanized areas. The regulatory agency may also issue MS4 permits for MS4 operators outside urbanized areas as appropriate. MS4 permit requirements vary from state to state and even from region to region within a state. Despite the differences, almost all MS4 permits require the development of a Stormwater Management Plan (SWMP) that addresses the following 6 control measures:

1. Public Education and Outreach
2. Public Participation/Involvement
3. Illicit Discharge Detection and Elimination
4. Construction Site Runoff Control
5. Post-Construction Runoff Control
6. Pollution Prevention/Good Housekeeping

Currently, not every Navy installation is issued a MS4 permit, but it is expected in the future that regulators will require more bases to operate under MS4 permits and implement the 6 control measures. For bases currently not operating under MS4 permits, initially complying with the permits may be daunting because of increased requirements and lack of staff. This report investigated various management tools and resources that would help installations keep track of and manage the different requirements of their MS4 permits. Guidance was created from this project, located in Appendix A.

1.2 REGULATORY DRIVERS

The regulatory driver for this need stems from the new issuance of MS4 permits for Navy installations. The regulatory authority driving MS4 permit issuing and enforcement varies from state to state, and can include a state environmental protection office or a regional water quality control board. For example, Naval Base San Diego is under the jurisdiction of San Diego Regional Water Quality Control Board while Naval Base Kitsap is under the jurisdiction of the Washington State Department of Ecology. Because each region is independent of one another, the requirements in the MS4 permits per installation may vary. However, not every state or regional board has issued MS4 permits, but as cities' population increase or under the discretion of the state, it is expected that more Navy installations would be issued MS4 permits.

1.3 OBJECTIVE

The objective is to compile existing resources (e.g. spreadsheet templates, software, methodology, inspection templates) used by public agencies and Navy installations for managing their MS4 permits. By doing this, stormwater managers without MS4 permits do not have to start from scratch in finding commercially available software or developing their own methodology. The deliverable is a guidance document detailing the findings and allowing stormwater managers to select the most appropriate technology or methodology for their sites. In addition, any spreadsheet templates collected are uploaded on Environmental Management System (EMS) Web and are accessible to Navy stormwater personnel (See Section 2.4).

2.0 TECHNOLOGICAL FINDINGS

2.1 MARKET SURVEY

From October 2012 through December 2012, various public agencies (see Table 1) with MS4 permits were contacted and asked how they managed their MS4 permits. At the same time, the Naval Facilities (NAVFAC) water media field team (MFT) was contacted for points of contacts (POCs) at bases with MS4 permits; however the reported number of bases with MS4 permits was few. In July 2013, NAVFAC EXWC released a sources sought solicitation on FedBizOpps to solicit for technologies to a wider audience. See Appendix C for Solicitation #N39430R13SWRW. The advertisement was listed on FedBizOpps for 30 days. Also, in July, the water MFT was contacted again for POCs at bases with MS4 permits. The number of responses were much better the second time. A total of eight public agencies, seventeen Navy sites and three Marine Corps bases (some Marine Corps bases have Navy operated Public Works Departments) were contacted and asked how they complied and managed their MS4 permits (i.e. how they organized their data, managed inspections, followed up with action items etc.). The public agencies commonly use a database software, spreadsheet software, or proprietary software designed specifically for their company. After interviewing the staff at the public agencies, the most common lessons learned was to be organized as much as possible. At Navy installations, the personnel managing the MS4 permits commonly use a spreadsheet software, handwritten forms, and contractors to keep track of inspections and record keeping. Some of the staff have a lighter load because they manage small or only one base, while others manage larger or multiple bases. The results of the findings from the public agencies and Navy sites are listed in Table 2-1 and Table 2-2 respectively. Table 2-2 is also a comprehensive list of Navy installations with MS4 permits to date (as of the time this report was published).

2.2 RESULTS

The findings from the market survey and FedBizOpps are listed in the tables below.

Table 2-1. Responses from City/County on Managing MS4 Permits

City/County	Method
County of Los Angeles	Proprietary software
County of San Diego	No Response
County of Ventura	• Spreadsheet software • Database software • Proprietary software
City of Seattle	• Spreadsheet software • Custom software to track source control and inspections
City of Torrance	• Spreadsheet software • Database software
City of Thousand Oaks	• Spreadsheet software • Allocate load to staff
City of Santa Barbara	No Response
City of Ventura	• Use spreadsheet document processing software to track control measures • Use custom designed software for input/output data

	• Switching to Energov

Table 2-2. Responses from Navy Sites on Managing MS4 Permits

Naval Base	Method
Naval Air Station (NAS) Corpus Christi	• Has MS4 Permit • Tenants (e.g. Coast Guard) conduct self-inspections • Use of BOSS contractor • Use of hard copy for inspections • Follow the SWMP • Reach-back to NAVFAC SE for SWMP development
NAS Oceana, NAS Oceana Dam Neck Annex, Joint Expeditionary Base (JEB) Little Creek-Fort Story, Naval Medical Center Portsmouth and Scott Center Annex	• Has MS4 Permit • Spreadsheet software • Managed by NAVFAC Mid-Lant • Manages 5 sites but under one general permit (Hampton Roads Regional MS4 Permit) • Hire consultant to examine man-power efficiency and lighten the load
NAS Jacksonville	• Has MS4 Permit • Currently uses pen/paper • Possibly seek funding via EPR for contract
NAS Lemoore	• Has MS4 Permit • Initial stages of addressing MS4 Permit • Request assistance from Southwest and Regional Water Quality Board
NAS Pensacola	• Has MS4 Permit • BOSS contractor does 100% of work • Will discontinue in 2017
Naval Base (NB) Kitsap–Bangor, NAS Whidbey Island, Naval Station (NS) Everett, Naval Magazine Indian Island	• No MS4 Permit • Expects to receive permit in FY14
NAVFAC HI	• Has MS4 Permit • Uses database software to store in-house stormwater inspections • Contractor uses pen/paper for inspections • Uses spreadsheet software to store sample data and illicit discharges • Public outreach: Sends e-mails for public education and advertise base activities
NB Guam	• No MS4 Permit • Pending EPA's decision
NB Ventura County	• MS4 Permit Issuance pending • Using EPR to draft a SOW
Naval Weapons Station Earle	• Has MS4 Permit • Hard copy inspection forms • Pen/paper
NS Great Lakes	• No MS4 Permit • Covered by its industrial permit
NS Mayport	• Has MS4 Permit • Uses spreadsheet software for inspections tracking • Uses pen/paper for inspections • Follow SWMP • Publish news articles and brochures for public outreach and education
NS Newport	• Has MS4 Permit • Spreadsheet software

	• Contracts out fieldwork, inspections and record keeping. Contractors use Excel spreadsheet sent from State.
Naval Support Activity (NSA) Mechanicsburg	• Has MS4 Permit • No response
NSA Mid-South	• Has MS4 Permit • Spreadsheet software • Pen/paper • EMS Web • Small base so manageable
Naval Construction Battalion Gulfport	• Has MS4 Permit • Permit Tracker (records management methodology) • Organized binder • Pen/paper
Marine Corps Air Station Cherry Point	• Has MS4 Permit • Conducts inspections with 4 technicians • AMEC customized a database with e-mail reminders and organizes data
Marine Corps Base (MCB) Camp Lejeune	• Has MS4 Permit • Uses e-SWPPP via CITRIX • Links a database software and GIS-layers • Data housed on local server • Real-time updates
MCB Hawaii	• Has MS4 Permit • Uses SWMP as guide for inspections • Uses pen/paper • Task assigned to facilities
Pearl Harbor Naval Ship Yard & Intermediate Maintenance Facility	• Has MS4 Permit • Inspects shipyard with pen/paper

In addition to tracking systems that use either a spreadsheet or database software, there are two known commercially available software designed specifically for managing MS4 permits. Also, there was only one vendor that responded to the FedBizOpps advertisement. The vendor does not have existing software but seeks to develop a web-based SQL database for the Navy. Table 2-3 lists the companies, costs and descriptions.

Table 2-3. Commercially Available Software

Name	Vendor	Cost	Description
MS4 Front	Houston Engineering Inc.	$5,000 upfront + $2,000/year maintenance	• Web-based • Data management • Only in MN but may develop for other states
MS4 Web Permit Manager	CBI	$2,400-$9,000 ($0.06/capita/entity) upfront + $1,200/year maintenance $20,000 for self-hosting	• Web-based • Data management
SQL Server Enterprise 2012	Venture Database Inc	$33,200 for database development	• Web-based • Single server that houses all Navy MS4 permit data • Uses SQL • Needs to be developed

The first two software are similar in function but different in style and themes. Most importantly, they provide easy and efficient tools in keeping track of the different requirements in the MS4 permit.

2.3 e-SWPPP

Although the NESDI program does not usually extend to Marine Corps facilities, Marine Corps bases were contacted because they have Navy operated Public Works Departments. At Camp Lejeune, the stormwater personnel manages its MS4 permit with e-SWPPP via the CITRIX server. It has similar features as the commercial software such as keeping track of inspections while incorporating GIS. Although the tool seems useful, this tool is currently limited to only the Marine Corps, despite the Navy's capability of also using the CITRIX server. NAVFAC Southeast is considering this option as potentially suitable for use at bases that have Base Operating Support Contracts (BOSC) implementing MS4 requirements. See Figure 1 for a screenshot of e-SWPPP.

Figure 1: Screenshot of e-SWPPP.

2.4 EMS WEB

In addition to ensuring the inspections, record keeping and data management are kept in order, installations have to address the six control measures listed in Section 1.1. To assist in complying with this requirement without duplicating efforts, several examples of each topic have been compiled and uploaded onto EMS Web, a Navy-operated database that stores and tracks environmental documents. The examples were downloaded from different agency websites. The website links are also posted in EMS Web for those interested in viewing them. By compiling existing, useful templates and putting them in one location, Navy stormwater managers may access the share folder and use existing templates instead of developing their own. Or, the templates may facilitate in spurning new ideas and creations applicable to their installations. The share folder on EMS Web also has spread and document templates used for recording illicit discharges and inspections; cost estimates; inventory of BMPs, public education, active construction sites and enforcement responses; and sample inspection forms. These templates are

for information purposes only. The link to EMS Web is through the US Navy Environmental Portal. See Appendix B for instructions on how to access the Stormwater MS4 Permits folder in EMS Web. There are a total of 8 folders: six folders that contain templates per control measure, one general folder that contains spreadsheet and document inspection templates, and another folder for shipyard templates. An EMS Web account is required for access.

While EMS Web can be used to store templates, it can also be used to help organize and store components of the SWMP for the permit. EMS Web is a management system and other functionalities include the following:

- Track completion of action items e.g. reporting requirements, management plan updates, permit renewals
- Plan, document and manage compliance inspections and audits
- Manage and organize documents
- Maintain records e.g. meeting minutes, training and correspondence
- Easily create and run queries
- Create customized reports
- Compile internal assessment documentation for easy reporting

NSA Mid-South uses EMS Web for such purposes. The following are examples of the various ways EMS Web can be used: use the checklist function for audits/inspections; store monthly construction site inspections; upload BMP site inspections; store copies of permits, catalog correspondence e-mail correspondence with regulatory agency; and track stormwater objectives or targets. Once a MS4 Permit folder is established, only those with administrative rights along with the user have access to the folder. Although this tool has potential, the downside is that it can be time consuming to setup the checklists and folders.

New users to EMS Web need to establish an account via EPR Portal. The link to the portal is listed above, and when setting up an account, ensure that the checkbox for EMS Web access is checked.

2.5 DEMONSTRATION

After reviewing the available MS4 compliance methods used by the Navy, the most innovative and helpful tools were EMS Web and a database that was developed by a contractor specifically for MCAS Cherry Point. Ms. Rachael Methvin from NAVFAC Mid-South agreed to provide demonstrations via DCO to stormwater personnel with regards to their tools. NAVFAC Mid-South uses EMS Web to help with their MS4 compliance. Mr. Ruan Stewart from MCAS Cherry Point uses a database that was developed for them, but their system was not ready for demonstration.

Ms. Rachael Methvin demonstrated via Defense Connect Online (DCO) how EMS Web helps with inspections and tracking MS4 Permit compliance. The demonstration took place on 23-January 2014, and the audience comprised people from NAVFAC HI and NAVFAC SW. The demonstration went over the following functions:

- Organized document storage (Figure 2):
  - Upload important documents e.g. IAP and Industrial Wastewater Permit
  - Stores files in specific folders
- Audits/Inspections (Figures 3-5):
  - Checklist creator
  - Complete checklist on paper and "transfer" information checklist in EMS Web
  - Upload copy of all inspection forms
- BMPs (Figure 6):
  - Keeps track of equipment
  - Lists building with associated BMPs
  - Stores BMP description/photo
- Communications Log (Figure 7):
  - Upload e-mail correspondence
  - Stores/organizes communication record
- Training (Figure 8):
  - Tracks training conducted
  - Tracks information regarding training

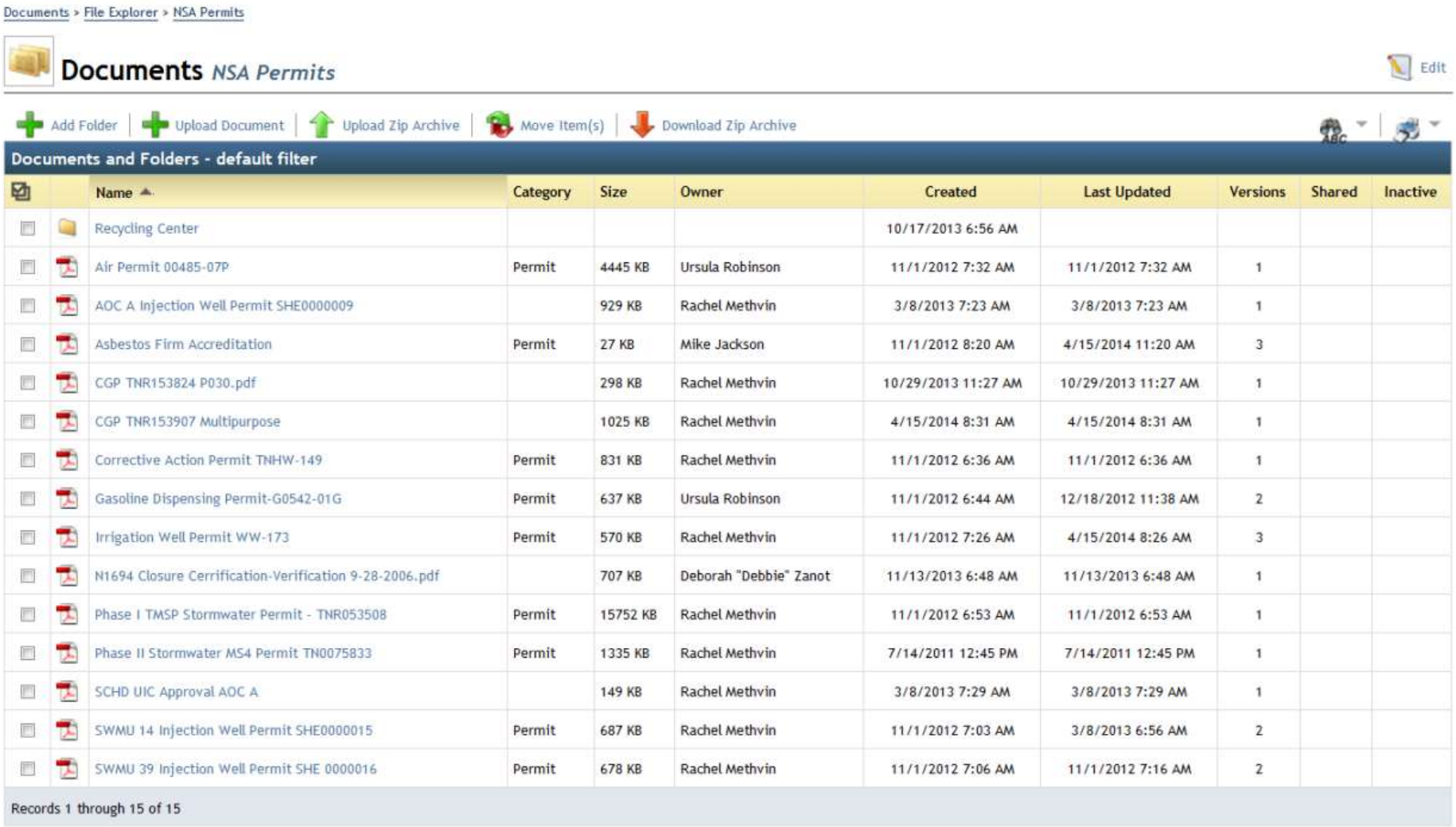
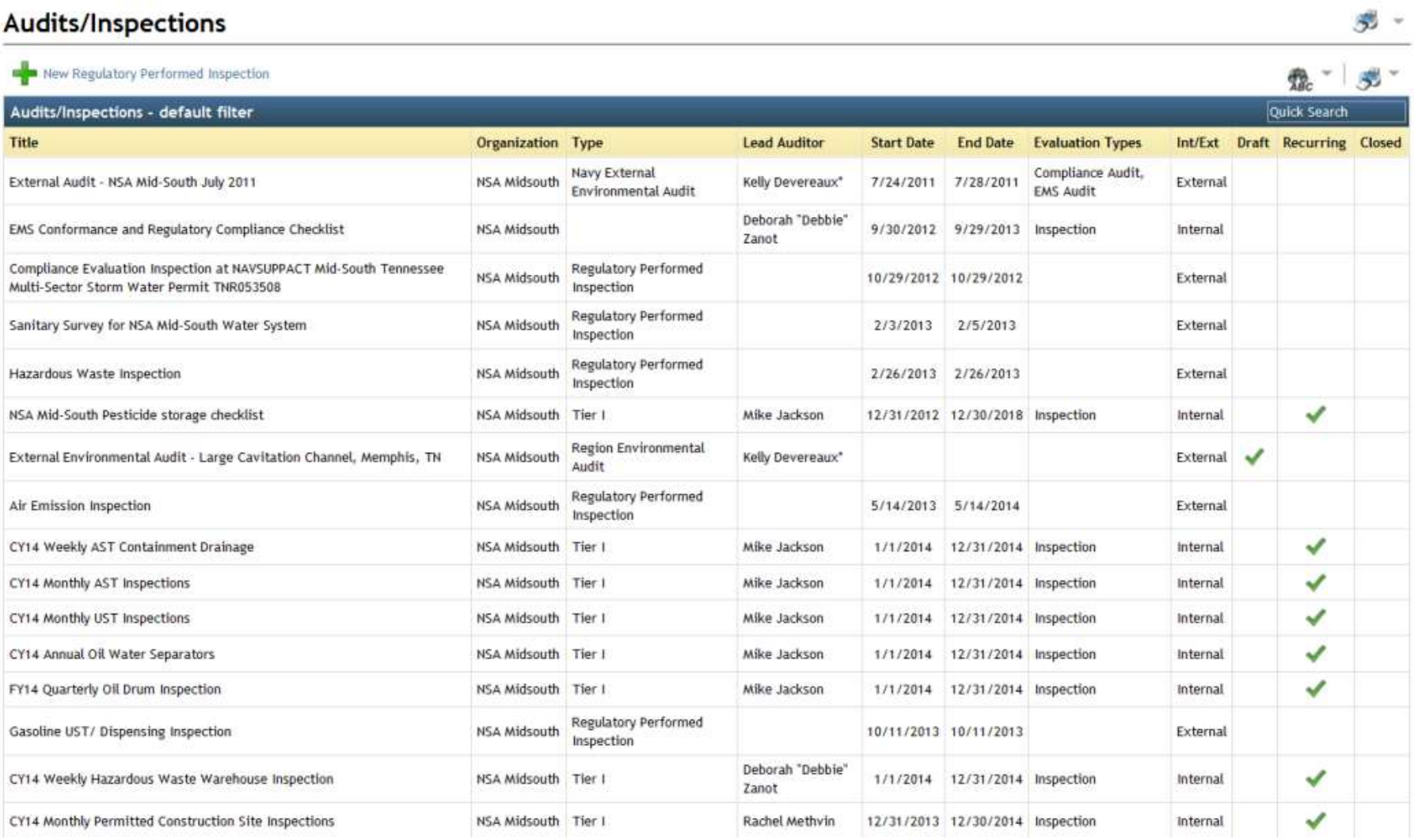


Figure 2: Storage of permits and other important documents.



Audits/Inspections

New Regulatory Performed Inspection

Audits/Inspections - default filter — Quick Search

Title	Organization	Type	Lead Auditor	Start Date	End Date	Evaluation Types	Int/Ext	Draft	Recurring	Closed
External Audit - NSA Mid-South July 2011	NSA Midsouth	Navy External Environmental Audit	Kelly Devereaux*	7/24/2011	7/28/2011	Compliance Audit, EMS Audit	External			
EMS Conformance and Regulatory Compliance Checklist	NSA Midsouth		Deborah "Debbie" Zanot	9/30/2012	9/29/2013	Inspection	Internal			
Compliance Evaluation Inspection at NAVSUPPACT Mid-South Tennessee Multi-Sector Storm Water Permit TNR053508	NSA Midsouth	Regulatory Performed Inspection		10/29/2012	10/29/2012		External			
Sanitary Survey for NSA Mid-South Water System	NSA Midsouth	Regulatory Performed Inspection		2/3/2013	2/5/2013		External			
Hazardous Waste Inspection	NSA Midsouth	Regulatory Performed Inspection		2/26/2013	2/26/2013		External			
NSA Mid-South Pesticide storage checklist	NSA Midsouth	Tier I	Mike Jackson	12/31/2012	12/30/2018	Inspection	Internal		✓	
External Environmental Audit - Large Cavitation Channel, Memphis, TN	NSA Midsouth	Region Environmental Audit	Kelly Devereaux*				External	✓		
Air Emission Inspection	NSA Midsouth	Regulatory Performed Inspection		5/14/2013	5/14/2014		External			
CY14 Weekly AST Containment Drainage	NSA Midsouth	Tier I	Mike Jackson	1/1/2014	12/31/2014	Inspection	Internal		✓	
CY14 Monthly AST Inspections	NSA Midsouth	Tier I	Mike Jackson	1/1/2014	12/31/2014	Inspection	Internal		✓	
CY14 Monthly UST Inspections	NSA Midsouth	Tier I	Mike Jackson	1/1/2014	12/31/2014	Inspection	Internal		✓	
CY14 Annual Oil Water Separators	NSA Midsouth	Tier I	Mike Jackson	1/1/2014	12/31/2014	Inspection	Internal		✓	
FY14 Quarterly Oil Drum Inspection	NSA Midsouth	Tier I	Mike Jackson	1/1/2014	12/31/2014	Inspection	Internal		✓	
Gasoline UST/ Dispensing Inspection	NSA Midsouth	Regulatory Performed Inspection		10/11/2013	10/11/2013		External			
CY14 Weekly Hazardous Waste Warehouse Inspection	NSA Midsouth	Tier I	Deborah "Debbie" Zanot	1/1/2014	12/31/2014	Inspection	Internal		✓	
CY14 Monthly Permitted Construction Site Inspections	NSA Midsouth	Tier I	Rachel Methvin	12/31/2013	12/30/2014	Inspection	Internal		✓	

Figure 3: Tracks inspections.

Audits/Inspections > Checklist Creator

IAP Field Assessment Checklist *Questions*

Back | Next

New Question | Add From List Builder | Reorder | Delete

Questions

Question Text	Section Header
Are there any emission sources at location not represented on permit that meet the requirements?	Air Quality
Are there ozone depleting substance (ODS) sources present (HVAC, Refrigerators, freezers, chillers, etc) not on ODS Inventory List?	Air Quality
If known or suspected asbestos containing material (ACM) is present in the building, has a survey been conducted?	Asbestos
Is there potential ACM not demarcated?	Asbestos
If known or suspected asbestos containing material (ACM) is present in the building, is an O&M plan developed for it?	Asbestos
If known or suspected ACM is present in the building, are ACM inspections conducted?	Asbestos
If known or suspected ACM is present in the building, do personnel know who to contact if issues arise associated with the ACM?	Asbestos
Are there obvious signs of water use inefficiencies that require correction?	Water Quality
Is there evidence of illicit discharge(s) or cross connection(s)?	Water Quality
Are potential pollution sources that may be exposed to storm water present? If so, are they protected/controlled properly (e.g. dumpsters, HMs, erodible soils)?	Water Quality
Is the facility/operation covered by the station's TMSP Industrial Stormwater permit? If so, is the facility in compliance with the site specific portions of the ISWMP?	Water Quality
Are there indications that a spill or other release has occured outside which was not properly reported and cleaned up?	Water Quality
Is erosion or slope failure reported?	Water Quality
Is the facility/area in compliance with the general portions of the ISWMP?	Water Quality
Are there Hazardous Materials (HM) present in quantity greater than 10,000 lbs?	Hazardous Materials

Figure 4: Sample of checklist created in EMS Web.

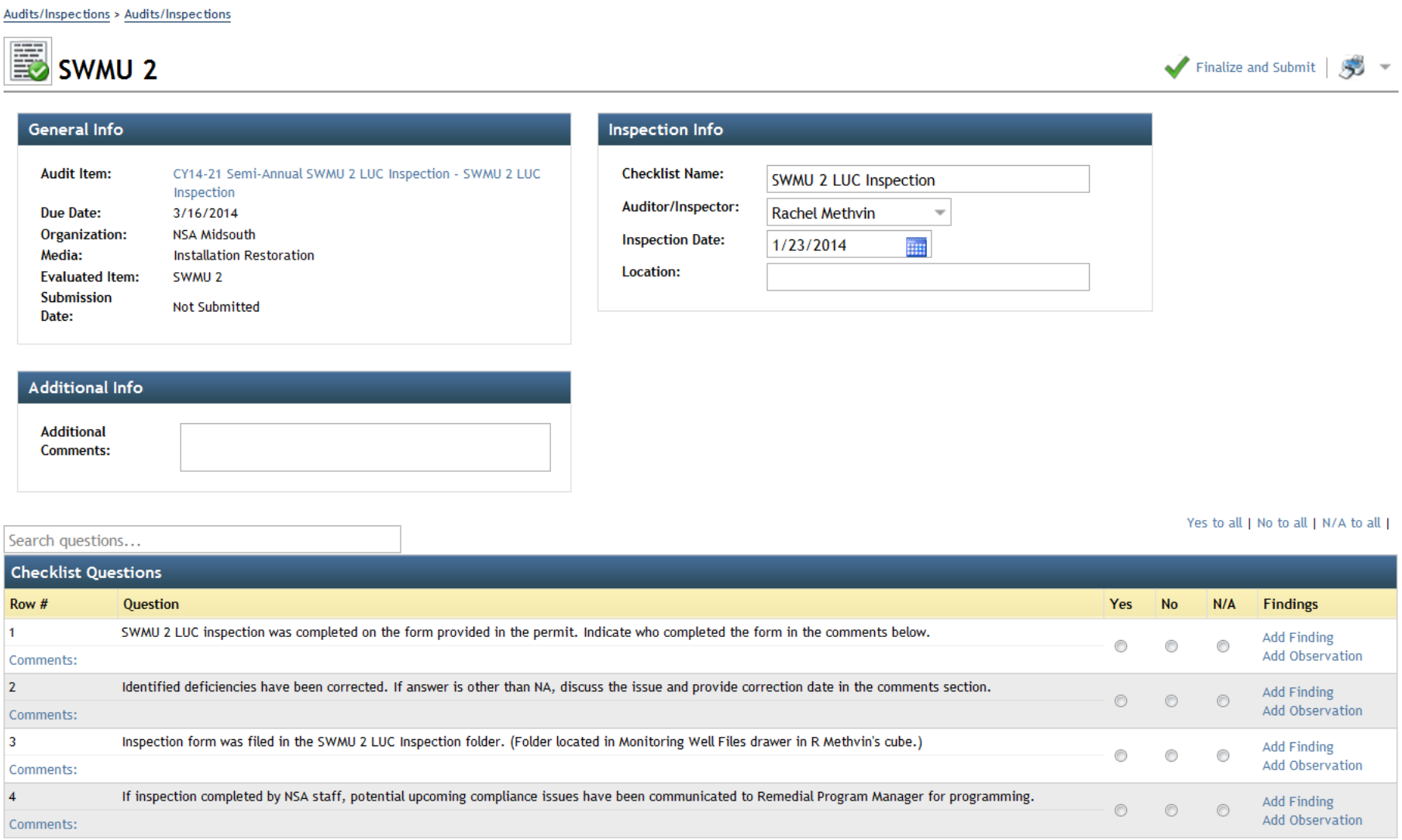


Figure 5: Sample of checklist with Yes/No questions.

EMS > EMS Data > Locations

Locations

Locations - default filter					
Building # / Area Name	Organization	Location Name / Area Desc	Type	Responsible Party	Inactive
344	NSA Midsouth	MWR RECYCLE STORAGE	Building		
349	NSA Midsouth	HOBBY SHOP GARAGE	Building		
359	NSA Midsouth	WATER WELL #2, N/S	Area		
362	NSA Midsouth	USAR Transportation Battalion	Building		
366	NSA Midsouth	SEWAGE PUMPING BUILDING	Building		
376	NSA Midsouth	FILLING STATION	Area		
394	NSA Midsouth	CNRC ADMIN STORAGE	Building		
397	NSA Midsouth	AUTO TUNE-UP BUILDING	Building		
447	NSA Midsouth	BLDG 447 MWR RENTAL LODGING	Building		
448	NSA Midsouth	BLDG 448 MWR RENTAL LODGING	Building		
449	NSA Midsouth	BLDG 449 MWR RENTAL LODGING	Building		
450	NSA Midsouth	BLDG 450 NAVY INN	Building		
451	NSA Midsouth	BLDG 451 NAVY INN	Building		
452	NSA Midsouth	BLDG 452 NAVY INN	Building		
453	NSA Midsouth	BLDG 453 NPC ADMIN	Building		
454	NSA Midsouth	BLDG 454 BACHELOR HOUSING	Building		
455	NSA Midsouth	BLDG 455 NAVSUPPACT HQ	Building		

Figure 6: Tracks BMPs associated with buildings.

EMS > EMS Tools

Communication Log

New Item

Communication Log

Type	Subject	Date	Name	Phone	Organization	POC Name	POC Phone	Name	Phone	Organization	POC Name	POC Phone	Notes
Letter	TMSP Annual Fee Proof of Payment	10/2/2013	James McAdoo		TDEC Division of Fiscal Services	Rachel Methvin	(901) 874-5904						Media Area: Stormwater. Due date 10/15/2013. Respo...
Email	MS4 Tree Protection Response	10/3/2013	Harold Madison		TDEC Office of Sustainable Practices	Rachel Methvin							Media Area: Stormwater. Responding to letter sent ...
Letter	TMSP Annual Maintenance Fee	10/20/2013	TDEC Consolidated Fee Section	(615) 532-0065		Rachel Methvin							Media Area: Stormwater. Letter requires fee paymen...
Email	FY 13 Natural Resources/INRMP Metrics Summary Repo...	12/17/2013	Robbie Sykes	(931) 525-4979	U.S. Fish and Wildlife Service	Debbie Zanot		Rob Colvin	(731) 423-5725	Tennessee Wildlife Resources Agency	Debbie Zanot		Media Area: Natural Resources; Requested verificat...
Letter	Audit Report--Drinking Water Plant	11/21/2013	Will Pride	(931) 840-4168	TDEC	Rachel Methvin	(901) 874-5904						Media area: Drinking Water. Reply mailed 1/21/2014...
Email	Various topics wrt CY 2013 Annual Report	12/26/2013	Dave Dowlen	(615) 532-0316	TDEC SWM	Debbie Zanot							Media Area: Hazardous Waste. Mr. Dowlen initiate...
Letter	NSA Mid-South Public Water System Change in EFO	1/2/2014	Gharib Khan	(901) 371-3015	TDEC	Rachel Methvin	(901) 874-5904						Media Area: Drinking Water. No reply required. The...
Letter	Draft SAP Approval for SWMU 17 & 22	12/5/2013	Roger Donovan	(615) 532-0864	TDEC	Rachel Methvin	(901) 874-5904						Media Area: Environmental Restoration. No reply re...
Letter	MS4 Permit Annual Fee Invoice	12/16/2013	Jim McAdoo	(615) 532-0684	TDEC	Rachel Methvin	(901) 874-5904						Media Area: Stormwater. Due date 1/31/2014. Annual...

Figure 7: Tracks letter and e-mail correspondence with regulatory agency.

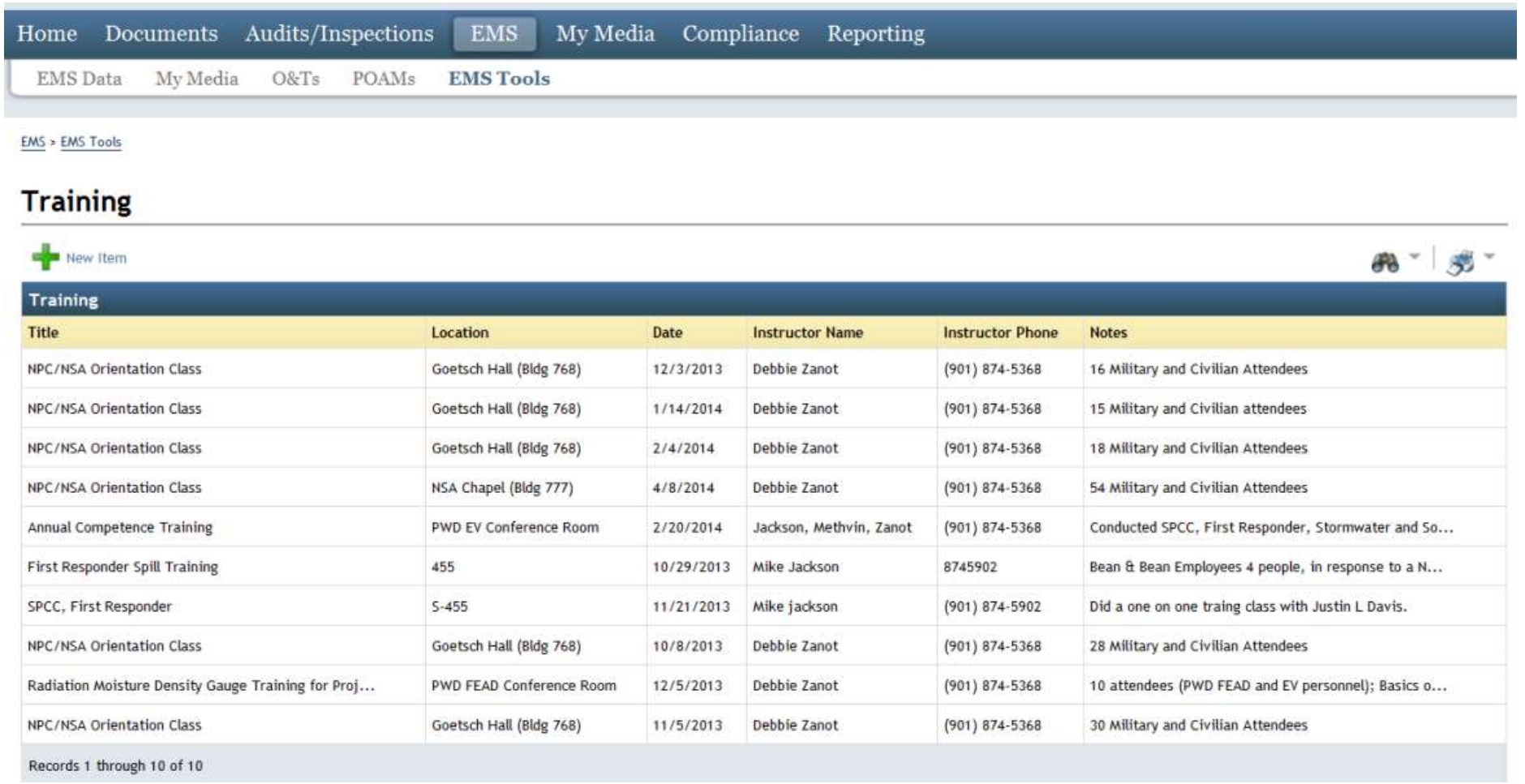


Figure 8: Tracks training information.

3.0 PERFORMANCE GOALS

Although no performance testing was required in this project, there were specific criteria (recommend by NB San Diego (submitter of the "need")) that must be met for any findings to be included in the Guidance Document. The performance goals are both quantitative and qualitative. The quantitative goal is that the technology must be cost effective; i.e. the capital investment must not exceed $10K and the annual maintenance fees must not exceed $5K annually.

Secondly, the qualitative goal is that the technology or methodology must be easy to use. Training should be at a minimal i.e. not more than 1 day and there should be minimal administrative burden. Note that due to individual personnel preferences per installation and the installation size, it is expected that not all technologies or methodologies will increase compliance and efficiency for everyone. Therefore, a goal specifically for increased compliance and efficiency has been excluded. See Table 3-1 for a tabular format of the performance objectives.

Table 3-1. Performance Goals

Performance Goals	Metric	Data Requirements	Success Criteria
Quantitative Performance Goals			
Affordable	$$	Capital costs and annual fees	< $10K capital investment <$5K annually
Qualitative Performance Goals			
Ease of Use	Time used for training and work NMCI compatible	Feedback from users on intuitive usability and operations NMCI certified	Minimal training and administrative burden NMCI compatible

4.0 PERFORMANCE ASSESSMENT

4.1 TEMPLATES

The templates compiled during this project include spreadsheets for inspections, brochures, posters, and inspection forms. All were used successfully by Navy installations and public agencies. Therefore, the assumption is made that all are useful, but not all of them will be used. Because personal preferences differ per stormwater personnel, one methodology or template may work for one person but not for another. All the templates, brochures, posters, etc. have met the performance goals listed in Table 3-1. They are affordable and easy to use, despite their limitations of being primitive. It is recommended that stormwater personnel take the time to look through the different templates to find one that best fits.

4.2 SOFTWARE

The more advanced technologies such as MS4 Front and MS4 Web Permit Manager provide much more functions such as data organization, incorporating GIS data, e-mail reminders, inspections and control measures tracking and Annual Report generation from a template. These features are most likely what stormwater personnel who manage MS4 permits need; however, they fail the ease of use objective i.e. they are not easy to implement or acquire because they are not NMCI certified. MS4 Front is strictly web-based and the data is housed on the vendor's server. MS4 Web Permit Manager is also web-based but it allows the user to self-host. Although it is possible to self-host the system, the practicality of doing so is non-existent due to security and logistics issues. Because the software are not NMCI-certified and therefore are not easy to implement, they fail the ease of use performance objective.

4.3 EMS Web

EMS Web satisfies both quantitative and qualitative criteria, but the ease of use does depend on the base size. The website is Navy-owned, so there will be no cost incurred on the individual user for setting up an account and using the site. Training new users should not take more than 3 hours because the website is primitive and simple to use. However, because it is primitive, uploading documents can take some time. In addition, the user would have to create the folders and inspection checklist. Usually, after an inspection has been conducted, the user would record the results on the digital checklist on EMS Web. However, transferring data from paper to digital may be more appropriate for smaller bases because the process can be time consuming. For NAVFAC Mid-South, 20 minutes was spent to record the inspections of 5 locations. Larger bases can still use the other functions of EMS Web according to their personal preferences.

5.0 CONCLUSION

Currently, most Navy installations have industrial stormwater permits with only a quarter operating under MS4 permits. However, it is expected that more Navy installations will operate under MS4 in the future, as neighboring cities become more populated. Naval Base San Diego, who generated this need, received an MS4 permit after their stormwater permit was renewed. The need submitted to NESDI asked for a compilation of practices from installations that already have MS4 permits. Therefore, installations that do not have MS4 permits may have guidance in successfully complying and would not have to start from scratch. Some installations are understaffed and need guidance on how best to fulfill the many requirements in the permit. This project addressed the need by conducting a comprehensive search in determining the different practices of complying with MS4 requirements. Eight public agencies, fourteen Navy installations and 2 Marine Corps Bases with MS4 permits were contacted, and the lessons learned and practices were compiled in this document. The most common response was the use of a spreadsheet and database software while some agencies use customized software. One Navy installation contracts out the field inspections and record keeping. For installations with sufficient funding, contracting the field requirements is an efficient approach. However, the most viable options are the use of EMS Web, a spreadsheet software, or pen/paper. EMS Web has features that can assist with MS4 tracking; however, training may be required. Additional resources are posted on EMS Web for Navy use.

6.0 RECOMMENDATIONS

Currently, there is no one best approach to manage MS4 Permits. Depending on the size of the base, the number of staff, preferences and workload, there are different methods to manage the permit. See Appendix A for tips on planning for an upcoming MS4 permit and for managing the permits. The most common approach by public agencies and other Navy bases with MS4 permits is the use of a spreadsheet software, database software, or pen/paper. For the Navy's future, an excellent investment would be the use of software that integrates GIS, reporting templates, reminders and inspection tracking. Commercial off-the-shelf technology with these features exists and include state-specific permitting regulations; however, they are web-based applications, which poses a security threat.

A similar but different is the use of e-SWPPP. The Marine Corps Base at Camp Lejeune is taking this innovative and user friendly, electronic approach. The program is housed on the CITRIX server, and it links a database to GIS layers as well as provides real-time update. Currently, this technology is not being implemented in the Navy; however, this approach would be the closest method to a comprehensive electronic MS4 permit management system. The process to implement this in the Navy should be explored to determine its feasibility and viability.

Lastly, a successful implementation of the SWMP in the MS4 Permit requires full cooperation from the Public Affairs Office (PAO), base housing, Public Works, Morale Welfare and Recreation (MWR) office and Field Engineering & Architecture Department (FEAD). The SWMP has six requirements that need to be fulfilled, and cooperation from the different organizations can make compliance possible. PAO, base housing, and MWR have potential roles and responsibilities in executing the requirements of a MS4 permit, and they must be engaged to assess their perspective, resources, and capabilities of contributing to MS4 permit compliance. They should be considered for assisting with the distribution of flyers for public education, outreach and participation as required in the SWMP. The FEAD's cooperation is vital in implementing construction and post-construction site runoff BMPs. Public Works' help is needed for pollution prevention and illicit discharge detection and elimination. Each of these stakeholders can help implement the SWMP, and they should be involved throughout the SWMP development process. Therefore, they must be kept aware of the requirements from the beginning and offer assistance as warranted for fulfillment of the SWMP requirements.

APPENDIX A
GUIDANCE

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MS4 Permit Recommended Strategy

Currently, there is no one best approach to manage MS4 Permits. Depending on the size of the base, the number of staff, preferences and workload, there are different methods to manage the permit. For Navy installations that currently do not have MS4 permits but expect to acquire such a permit in the future, the bases should take the following steps:

1. Plan for your MS4 Permit using the MS4 Guidance Checklist spreadsheet on EMS Web (See Appendix B for EMS Web access instructions). Note, this was created for California, but other states may have similar requirements.
2. Once a MS4 permit is established, prepare the SWMP so that it complies with the permit specific requirements.. Coordinate SWMP development with FEAD, MWR, PAO, base housing and Public Works.
3. Development of the SWMP requires planning, identification of milestones, a budget, resources, schedule, communicating of team roles, responsibilities, and expectations, as well as tracking and follow up action. Be organized!
4. Review existing templates on EMS Web, and utilize any applicable templates.
5. Utilize EMS Web for correspondence tracking and inspections tracking if applicable.
6. If the workload will be contracted, include field inspections and record keeping using the forms from the state water quality board in the Statement of Work.
7. Brief Public Works Officer (PWO) about the construction and post-construction requirements in the MS4 Permit. PWOs may be unfamiliar with MS4 Permits. Include involvement from FEAD, MWR, PAO and base housing accordingly.
8. If MS4 Permit allows, conduct base inspections over 5 years.

For Navy installations that currently have a MS4 permit, employ the following steps:

1. Be organized ensuring records and documents are readily available and execution of requirements is clearly communicated, tracked and reported.
2. Review existing templates on EMS Web and utilize any applicable templates (See Appendix B for EMS Web access instructions).
3. Utilize EMS Web for correspondence tracking and inspections tracking if applicable.
4. If the workload will be contracted, include field inspections and record keeping using the forms sent from the permit issuer in the Statement of Work, if applicable. Otherwise, the contractor should develop the forms as part of the SOW and they should be approved by the base prior to use.
5. Brief Public Works Officer (PWO) about the construction and post-construction requirements in MS4 Permit. PWO may be unfamiliar with MS4. Include involvement from FEAD, MWR, PAO and base housing to implement SWMP accordingly
6. If MS4 Permit allows, conduct base inspections over 5 years.

A viable alternative to both e-SWPPP and MS4 management software is EMS Web. While it may not be as comprehensive and technically advance, it can store and track data. Setting up EMS Web for these functions would not be nearly as costly or time consuming. Also, the data would not be stored on one computer but on the EMS Web server. While EMS Web may have a learning curve compared to using a spreadsheet and pen/paper, this technology should be utilized along with a spreadsheet software. Please contact your local Environmental Management System POC if there are questions in setting up an account.

Lastly, upon speaking with numerous stormwater personnel who use a spreadsheet software for data tracking, they recommended that staying well organized is a key characteristic for managing the numerous requirements in the MS4 permit.

APPENDIX B
ACCESSING STORMWATER MS4 PERMIT TEMPLATES

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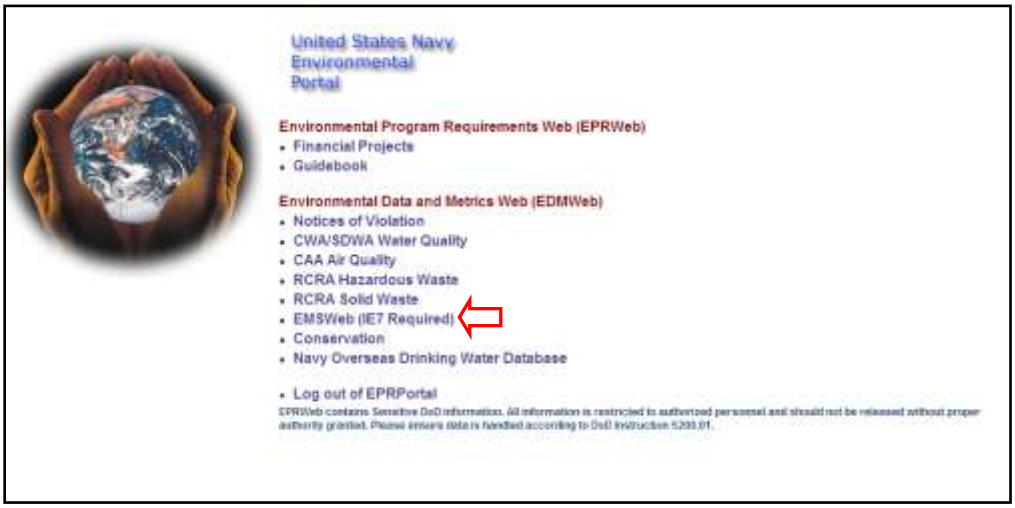
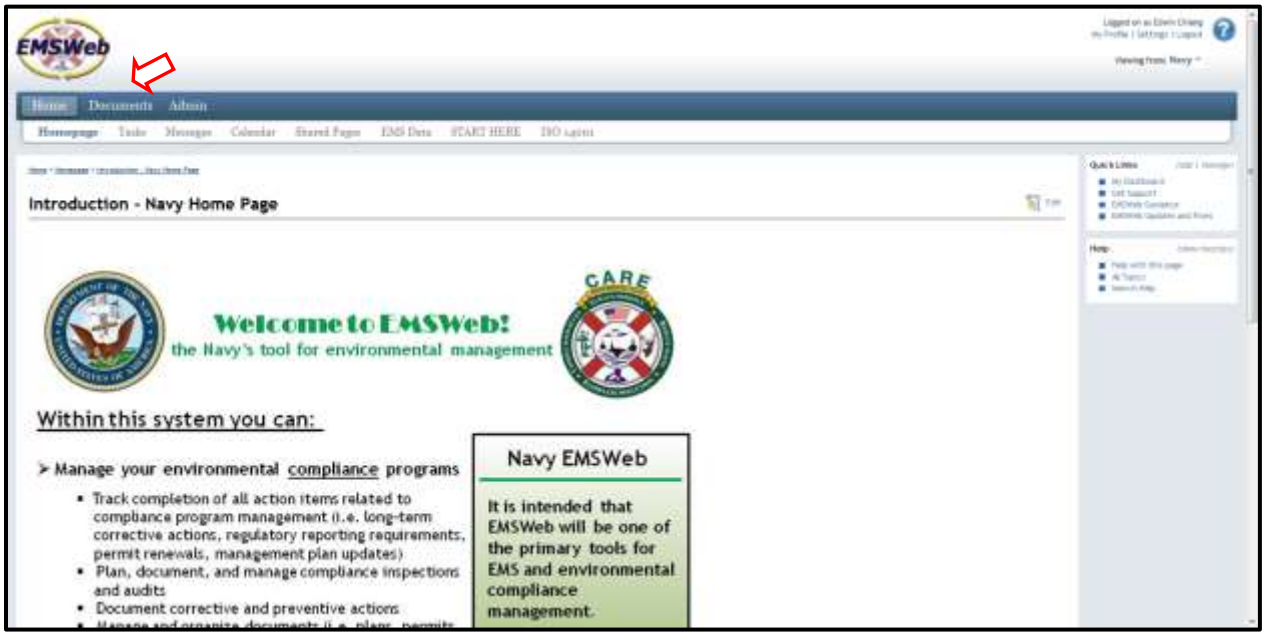
1. Log-in to EPR Portal.

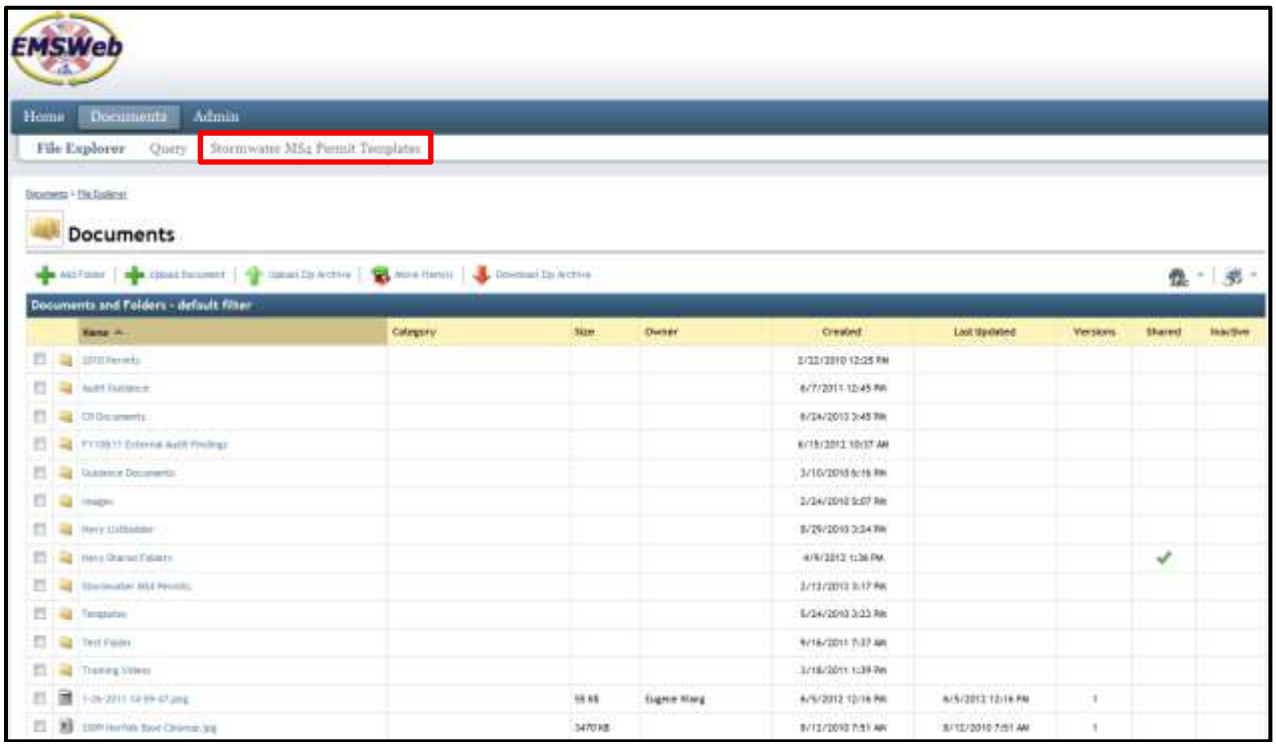
2. Click on EMS Web



3. Click on the Documents Tab



4. Click on the Stormwater MS4 Permit Templates



APPENDIX C
SOLICITATION FOR SOURCES
SOUGHT #N39430R13SWRW

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SOURCES SOUGHT ANNOUNCEMENT

The Naval Facilities Engineering and Expeditionary Warfare Center (NAVFAC EXWC) is seeking ***new*** technologies to increase efficiency and productivity in complying with the requirements in Municipal Separate Storm Sewer System (MS4) permits for Navy installations. The type of technology being sought is one that manages data and generates reports.

New technologies should assist in meeting the regulatory requirements in all 50 states. NAVFAC EXWC is particularly interested in identifying technologies with some or all of the following characteristics:

- User friendly
- Organize and manage historical water quality data
- Compile data and submit reports to state regulatory agency in the correct format
- Organize records of inspections, observations etc.
- Remind staff of upcoming events e.g. submit report to state, take water quality samples, make inspections etc.
- Able to sync data collected at the field to the database

Until 30 July 2013, providers can submit their technology by responding to Sources Sought - at FEDBIZOPPS https://www.fbo.gov/ or NECO https://www.neco.navy.mil/ [click on Synopsis and type in solicitation number]. Responses received after this deadline may not be considered. Since this is a sources sought announcement, there is no guarantee of procurement.

MS4 Permit Solicitation Questionnaire

Solicitation# N39430R13SWRW

1. Please describe how your company's technology can facilitate stormwater personnel in meeting the regulatory requirements in MS4 permits.

2. Please provide the following for your company's technology specifically relevant to costs and versatility:
    a. Capital cost
    b. Maintenance cost
    c. Be used in all 50 states?
    d. Generate reports according to the state's format?

3. Has your company ever worked with the DoD? If so, please provide a reference.

Any known complications/failures?