APPENDIX Q

Act 220 Discharge Flow Compilation [Discharge Monitoring Report (DMR)] Procedures and Database Users Manual

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Purpose and Use of the Flow Data Compilation/DMR (Discharge Monitoring Report) Database

The purpose of this database is to store flow data from discharges to streams of the Commonwealth. The major source of flow data for this database is the discharge monitoring reports (DMRs) that permittees under the National Pollutant Discharge Elimination System (NPDES) are required to submit. The secondary source of information is the EPA Permit Compliance System (PCS) database. However, to provide program coordination and quality assurance for Pa. Department of Environmental Protection (Pa. DEP), the database is populated with information already existing in the DEP electronic Facility Authority Compliance and Tracking System (eFACTS) and verified or modified using information contained in the NPDES permit and DMR files housed in DEP Regional Offices. Data for discharges regulated under the NDPES program are available in DMRs; however, data for abandoned discharges (those with no responsible party) are not available in DMR form. These discharges are primarily associated with recource (mining and oil & gas) extraction activities. For these discharges (termed non-DMR discharges), alternate sources of data were used. These include the DEP Sample Information System (SIS) database, the DEP Abandoned Mine Land Inventory System (AMLIS) database, the Office of Surface Mining (OSM) National Abandoned Land Inventory System (NALIS), the DEP Orphaned & Abandoned Oil & Gas Wells database, and various technical reports and assessments.

Before entering data into the database

Procedure1 – NPDES permit source lists

Most permits will be populated into the database from the eFACTS system. However, three additional sources of permit lists based on geographic area (county/municipality) are available and should be cross-referenced to assure all permits are included:

- NPDES permit list maintained by DEP Permitting and Compliance in the central office
- Query of the EPA PCS system
    - Go to http://www.epa.gov/enviro/html/water.html#PCS
    - Under the heading "Permit Compliance System", click on "Water Discharge Permits Query".
    - Query by county and state under "Geography Search". Check box "Major Dischargers Only" near bottom of form. Under "Search Values" chose "Use multisystem …". Under "Output Selection" chose "Basic Facility Information".
    - This brings up a report of all major facilities in whatever county you have chosen.
- Permit Engineer in the Regional DEP offices

Procedure2 – Importing data from eFACTS into the database

A request is made to DEP to receive permit and DMR data from eFACTS by geographic areas (county and municipality). DEP will provide an Access database of the requested data with tables named the same as those in the DMR database.

The following tables will need to be imported by choosing "File/Get External Data/Import"

- FIX_DBA_SRBC_NAICS
- FIX_DBA_SRBC_PERMITS
- FIX_DBA_SRBC_PF_LOCATIONS
- FIX_DBA_SRBC_PF_MON_REPS
- FIX_DBA_SRBC_PF_STREAMS
- FIX_DBA_SRBC_PRIMARY_FACILITIES
- FIX_DBA_SRBC_SF_MON_REPS
- FIX_DBA_SRBC_SF_STREAMS
- FIX_DBA_SRBC_SICS
- FIX_DBA_SRBC_SUB_FACILTIES

Since these tables are already part of the database, Access will import the tables and add a 1 (one) at the end of the name. Example: FIX_DBA_SRBC_SICS1. Each table with a 1 (one) at the end of the name will need to be appended to its corresponding table using its corresponding append query. Example: FIX_DBA_SRBC_SICS1 will be appended to FIX_DBA_SRBC_SICS. After the data has been appended, the tables that were appended can be deleted from the database.

Procedure3 – Importing data from PCS into the database

- o Go to http://www.epa.gov/enviro/html/water.html#PCS
- o Under the heading "Permit Compliance System", click on "Water Discharge Permits Query".
- o Query by county and state under "Geography Search". Check box "Major Dischargers Only" near bottom of form. Under "Search Values" chose "Use multisystem …". Under "Output Selection" chose "Basic Facility Information".
- o This brings up a report of all major facilities in whatever county you have chosen. First column of query output table is "NPDES ID"; click on link to permit number. This brings up a "detailed reports form" with "facility information" heading. Select the following reports: Facility, Measurements & Violations, and Outfalls/Pipe Schedules. Click on the "Search" button.
- o Will yield information on facility, outfalls (including lat/longs), and DMRs for each monitored parameter. Import the data into Excel as fixed-width delimited columns.

Obtaining Data For Entry Into the Database

General Permit and Discharge Monitoring Report Data

Consult the standard operating procedure (SOP) for data collection from discharge monitoring reports from NPDES permits for procedure (Appendix A).

Global Positioning System Data

Consult the SOP for data collection of location data using GPS for procedure (Appendix B).

Using the Database for Data Entry

Open database. This will bring up the main switchboard labeled "Act 220 DMR database". From this switchboard, three functions can be chosen:

- To modify permits and add flow data to permits populated in the database from the eFACTS system (Procedure4). This function is also used when it is necessary to add an additional discharge to a permit populated from the eFACTS system (Procedure5).

- To enter a new permit not populated from the eFACTS system (Procedure6). This function is also used when it is necessary to add non-DMR flow data from sources other than NPDES permits (abandoned mining and oil and gas discharges).

- To edit data previously entered by the user (to correct mistaken entries, etc.) (Procedure7).

A process flow chart showing the structure of and the relationships between the database forms is shown in Figure 1. Notice that the database has the capability of storing water quality data; however, these data are not required for the flow data collection task and thus will be for the use of the party entering the data only. Water quality data will not be transferred to DEP unless they request such transfer. The database will also store data acquired from Global Positioning Systems (GPS) regarding the location of discharges. This will serve three functions:

- To obtain locational data from those discharges which currently do not exist in the NPDES permit or the eFACTS system.

- To obtain locational data from those discharges which are obviously incorrect in a Geographic Information System (GIS) analysis.

- To provide quality assurance for the eFACTS system data.

***Procedure4 – Entering flow data and verifying and/or modifying permit
information in the database from the eFACTS system***

- Use the "Search" drop-down box (located on the upper left of the permit information form) to locate the number of the NPDES permit you will be entering data for.

- On the "permit information" form, you will enter and/or verify the following data fields (if modification is necessary, include text in the "Comments" to explain the change):
  - Data entry information
    - DEP Office
    - Entry initials
    - Date entered
  - Permit description
    - Permit number
    - Expiration date
    - Permittee
    - Waste type
    - SIC code
    - Municipality - <u>be sure when you are modifying this field to choose the correct county to match the municipality from the choices listed</u>
    - County
    - Phone number
    - Comment
  - Receiving waters – <u>make sure that information entered into these boxes are for the permit as a whole, not a specific discharge; data on receiving waters that are discharge-specific will be entered into fields on the "Discharges/Outfalls" form</u>
    - Stream code
    - River mile index
    - PA DEP Subbasin

- When you have finished entering data into all fields on the "Permit Information" form, click on the tab at the upper left corner to switch to the "Discharge/Outfalls" form. On the "discharges/outfalls" form, you will enter and/or verify the following data fields:
  - Outfall information - <u>make sure that information entered into these boxes are for specific discharges, not the permit as a whole; data on the permit as a whole should be entered into fields on the "Permit Information" form</u>
    - Discharge/outfall
    - Municipality
    - County
    - Latitude/longitude – enter as degrees minutes seconds; decimal degrees will be calculated automatically

- Stream code
- River mile index
- PA DEP Subbasin

- If the permit has more than one outfall, you will enter all data (including flow, field corrected GPS, and water quality) for each outfall separately, then move on to the next outfall until you have entered data for all outfalls associated with the permit. Click on the arrow to move between outfalls. <u>Double-check as you are entering data for each outfall that you are using the correct form for the outfall number shown on the paper DMR forms you are inputting.</u>
  - Enter data – you will use the three forms under this tab to enter data associated with the outfall shown in the "Discharge/Outfall" field
    - Flow
    - Field corrected data
    - Water quality – link to form to enter selected water quality parameters (<u>these data will not transfer to DEP</u>)
    - New Discharge – select to enter data for a discharge (sub-facility) that is not part of the eFACTS data; however, the primary facility information is part of the eFACTS data.

- For each discharge/outfall associated with a given permit, you will be entering flow data from paper DMR files in various DEP offices. Click on the "flow" tab to open the link to the flow data input form. <u>For *each* numbered discharge/outfall on the "Discharge/Outfall" forms, you will enter up to 60 flow form records.</u> You will enter data by month for the years 2000-2004 (12 months/year * 5 years = 60 months) from the paper DMR forms in the DEP offices. In some cases, months may be missing (especially the most recent) or there may be no DMRs in the paper files; only enter the months for which you actually have paper forms. <u>Do not enter "0" for those months without DMRs.</u>

- On the "flow" form, you will enter and/or verify the following data fields for each month (up to 60):
  - Report type - in most cases, you will enter "Discharge Monitoring Report"; in cases of mining data or other data, you would enter "Other".
  - Date
  - Monthly avg flow – select the units in which the data are measured from the drop-down box under the label "unit".
  - Maximum flow - select the units in which the data are measured from the drop-down box under the label "unit".
  - Analysis frequency – if the monitoring frequency is not listed under the categories, select "Other".
  - Sample type - if the sample type is not listed under the categories, select "Other".
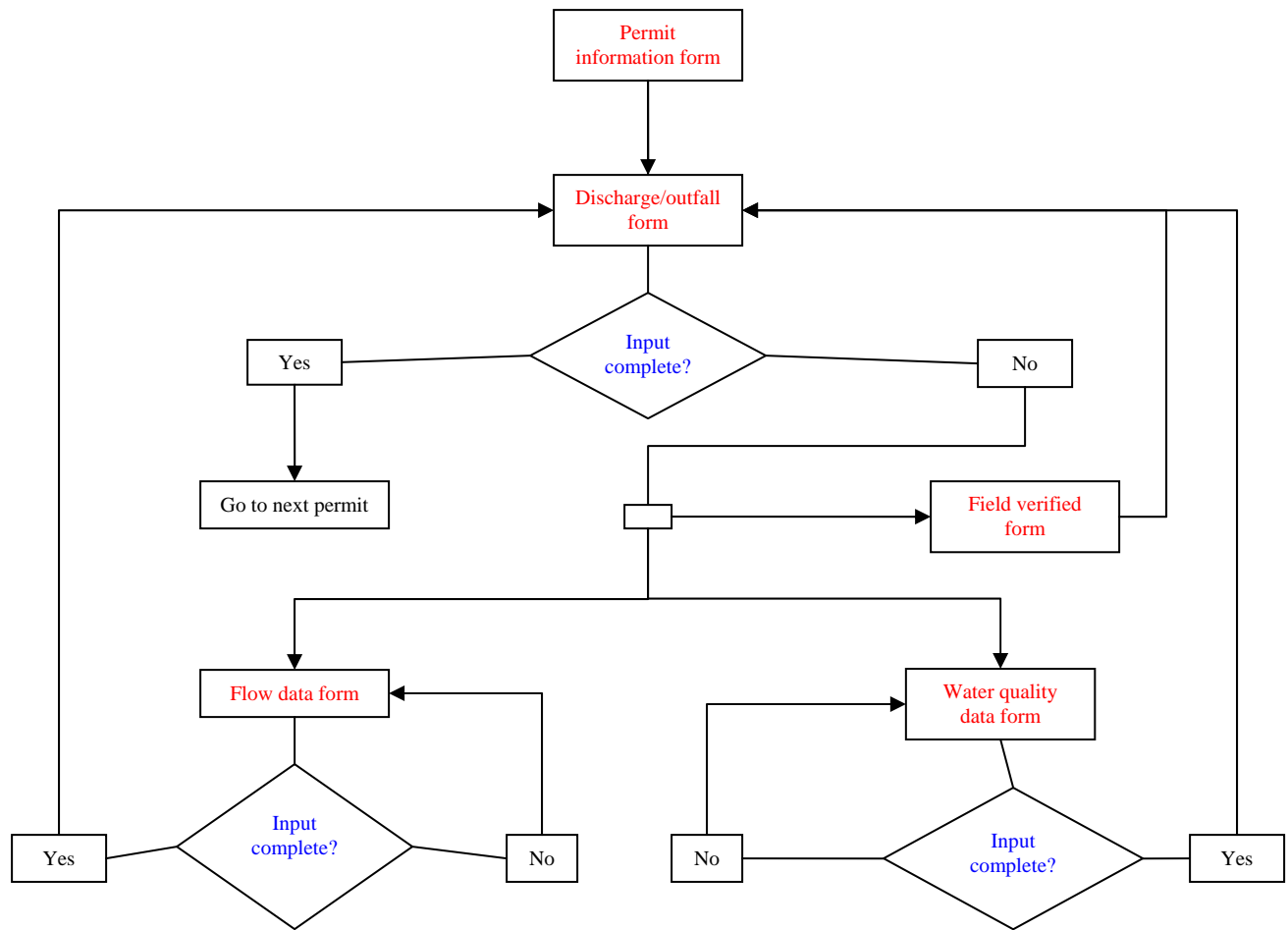 - Comment

Figure 1. Process flow chart for data entry into Act 220 discharge monitoring report database

- After you have entered all flow data from the DMR paper form for the selected discharge for the selected month, you will need to enter the flow data for the same discharge for all other months (up to 60) (Figure 1). At the bottom of the form is a record number bar with arrows that will read "1 of ?", with ? = the number of months of flow data (or number of flow data records you have already entered). To leave the current month you have input flow data for and continue to the next month, click on the plain right arrow tab (do not click on the right arrow with the line to the right of it or the right arrow with the asterisk to the right of it). This will open a new, empty flow data form which you will use to input flow data for the same discharge but for a different month. You can also Tab through the fields and once you Tab out of the comment field, an empty flow form will open to allow you to enter the next record. You will fill out this form in the same manner as the previous flow form, making sure you change the date and the flow values as they are recorded on the paper DMR files. You will continue this process for each monthly DMR paper report until you have entered all months of flow data for that outfall.

- After you have finished entering all flow data for the discharge/outfall for all months, you may either enter flow data for another discharge/outfall for the same permit, switch to another permit to begin entering data on the "Permit Information" form, or you may close the flow entry form to return to the 'Discharge/Outfalls" form and enter data under the "Field Corrected Data" or "Water Quality" tabs (Figure 1). Following is the procedure for data entry into fields on those two forms:

  o To enter field corrected GPS data, click on the "Field Corrected Data" form. This will open the field corrected GPS data entry form. On the "field corrected data" form, you will enter the following data fields:

    - Collected by
    - Collection date
    - Horizontal collection method – enter the method which you are using to collect GPS data; if you are unsure, enter "Global Positioning Method, unspecified parameters"
    - Latitude – enter as decimal degrees
    - Longitude – enter as decimal degrees
    - Reference point – enter the point of reference where you took the GPS data
    - Altitude – chose either feet or meters as units
    - Comment
      Use the return to permit button to return to entering permit data.

  o To enter water quality data, click on the "Water Quality Data" form. This will open the water quality data entry form. For *each* numbered discharge/outfall on the "Discharge/Outfall" forms, you will enter up to 60 water quality form records (Figure1). You will enter data by month for the years 2000-2004 (12 months/year * 5 years = 60 months) from the paper DMR forms in the DEP offices. In some cases, months may be missing (especially the most recent) or there may be no DMRs in the paper files; only enter for the months you actually have paper forms for.

o   On the "water quality" form, you will enter and/or verify the following data fields for each month (up to 60) (note – these parameters are set to record data related to nutrient and sediment pollution but can be changed by the user):

   ▪   Date

   ▪   Entered by

   ▪   NH3N - sometimes listed as "nitrogen as ammonia"

   ▪   Dissolved oxygen

   ▪   Total phosphorus

   ▪   Blank lines – you may use these lines to input names and values for other water quality parameters; you will find these listed on the DMR forms

- After you have entered all water quality data from the DMR paper form for the selected discharge for the selected month, you will need to enter the water quality data for the same discharge for all other months (up to 60) (Figure 1). At the bottom of the form is a record number bar with arrows that will read "1 of ?", with ? = the number of months of water quality data (or number of water quality data records you have input). To leave the current month you have input water quality data for and continue to the next month, click on the plain right arrow tab (do not click on the right arrow with the line to the right of it or the right arrow with the asterisk to the right of it). This will open a new, empty water quality data form which you will use to input water quality data for the same discharge but for a different month. You can also Tab through the fields and once you Tab out of the comment field, an empty flow form will open to allow you to enter the next record. You will fill out this form in the same manner as the previous water quality form, making sure you change the date and the values as they are recorded on the paper DMR files. You will continue this process for each monthly DMR paper report until you have entered all months of water quality data for that outfall.

- After you have finished entering all water quality data for the discharge/outfall for all months, you may either enter water quality data for another discharge/outfall for the same permit, switch to another permit to begin entering data on the "Permit Information" form, or you may close the water quality entry form to return to the 'Discharge/Outfalls" form and enter data under the "Field Corrected Data" or "Flow" tabs (Figure 1).

- After you have entered all flow and water quality data for all months for each discharge/outfall, have entered field corrected data for each discharge/outfall (if available), and have completed this process for all outfalls for each permit, you are done entering data for the selected permit. Continue to the next permit for which you are entering data by clicking on the "Permit Information" tab at the upper left corner of the "Discharge/Outfall" form, then using the search drop-down box to find the next permit (Figure 1).

Procedure5 – Adding a discharge to a permit from the eFACTS system

In certain cases, it may be necessary to add a new discharge to a permit downloaded from the eFACTS system. This would be necessary if there are more discharges contained in the paper NPDES and DMR files than are contained in the database.

1) Use the "Search" drop-down box to locate the number of the NPDES permit you will be adding a discharge to.
2) Click on the "discharges/outfalls" form.
3) Click on the button "new discharge". This will open a form for you to use to enter data for the new discharge.
4) Enter location and flow data for the new discharge using the procedure described in Procedure4.

Procedure6 – Entering a new permit not included in the eFACTS system

In certain cases, it may be necessary to add a new permit to the database that was not included in the permits from the eFACTS system.

1) At the main switchboard, select the button "enter new records". This will open a new form for both the permit data and the discharge/outfall data.
2) Enter data as described in Procedure4.

Procedure7 – Editing data entered by the user

In certain cases, it may be necessary to edit data previously entered by the user.

1) At the main switchboard, select the button "edit data".
2) Chose either flow or water quality. This will bring up a screen that will show you the data that are contained in the database. Use the "Search by permit number" drop-down box to choose the permit number you will be modifying data for. Click on the data that needs edited and enter the correct value.

Updating the main database with records from local databases

Procedure8 – Updating main database from local databases

1) Update database with one local drive at a time.

2) Import tables to main database from local drives. To import: File/Get External Data/Import. Navigate to the local database and import the following tables.
   a. FIX_DBA_SRBC_PERMITS
   b. FIX_DBA_SRBC_PRIMARY_FACILITIES
   c. FIX_DBA_SRBC_PF_STREAMS

d. FIX_DBA_SRBC_SUB_FACILITIES

e. FIX_DBA_SRBC_SF_STREAMS

f. FIX_DBA_SRBC_SF_MON_REPS

g. FIX_DBA_SRBC_SICS

h. tblSRBCData

i. tblWasteType_SRBC

j. tblWaterQuality

k. NewPermits

l. NewPF_Locations

m. NewPF_Streams

n. NewPrimaryFacilties

o. NewSF_MonReps

p. NewSF_Streams

q. NewSICS

r. NewSRBCData

s. NewSubFacilities

t. NewWasteType

u. NewWaterQuality

*They will import with the same name, with a one (1) added to the end of the name. Do not change the name. Example: FIX_DBA_SRBC_PERMITS1

3) Open form frmUpdateMainDatabase. Select the button Data Log Update. Enter your name, the current date, and the last date you will be using for the query. Check which local drive you are updating. Close table and enter the start date (one day after the date data from this local drive was updated) and end date for data records to be updated. Select the Update Main Database. This will update the main database with all records that have been added and/or edited from the local drive.

Update Main Database from Local Drives

Data Log Update

Enter Start Date

Enter End Date

Update Main Database

**Update and Append queries have been built for imported tables

a. qryUpdateSF

b. qryUpdateSFStreams

     c. qryUpdateSRBC_Permits

     d. qryUpdateSRBC_Primary_Fac

     e. qryUpdatePFStreams

     f. qryAppendSRBCData

     g. qryAppendWasteType

     h. qryAppendWaterQuality

     i. qryAppend_MonReps

     j. qryAppendSFStreams

     k. qryAppendPFStreams

     l. qryAppendSIC

     m. qryUpdateSIC

     n. qryUpdateNewPermits

     o. qryUpdateNewPF

     p. qryUpdateNewPF_Location

     q. qryUpdateNewPF_Streams

     r. qryUpdateNewSF

     s. qryUpdateNewSF_MonReps

     t. qryUpdateNewSF_Streams

     u. qryUpdateNewSIC

     v. qryUpdateNewSRBCData

     w. qryUpdateNewWasteType

     x. qryUpdateNewWQ

3) Delete each table that was imported to the Main Database.

Quality Assurance Procedures

All persons collecting data using these methods should receive training from the project manager based on this users' manual. Five (5) percent of all data entries into the Access database will be selected at random and checked by the project manager.

All persons collecting GPS data using this method should receive training from the project manager based on this users' manual. Five (5) percent of all latitude/longitude data from eFACTS and/or the Water Quality Protection Report will be re-GPSed to assure accuracy of location data.

Appendix A. STANDARD OPERATION PROCEDURE (SOP) FOR DMR (DISHCARGE MONITORING REPORT) DATA COMPILATION FROM NPDES (NATIONAL POLLUTION DISCHARGE ELIMINATION SYSTEM) PERMITS

Scope & application

This method is applicable to collecting data from DMRs within NPDES permits for all permits reviewed at Pennsylvania Department of Environmental Protection (Pa. DEP) regional offices. This method is not applicable to collecting discharge data from NPDES permits without DMRs (such as mining NPDES permits). The method is applicable for collecting data concerning general permit characteristics and hydrology.

Summary of method

Discharge data will be collected from DMR records in NPDES permits using laptop computers. The data will be entered into a Microsoft Access database. Data will be collected using a phased approach. Phase 1 data collection will be focused on critical areas (defined based on hydrologic considerations); Phase 2 data collection will expand to a major subbasin, then the rest of the basin.

Parameters to be collected and/or stored in the database include (but are not limited to):

- ID: Unique ID for facility
- Permit Number: NPDES permit number
- Expiration Month: Month permit expires
- Expiration Day: Day permit expires
- Expiration Year: Year permit expires
- Permit Status: Active/Inactive
- Years of operation: Date facility first started discharging
- Permittee: Name of permitted facility
- Phone Number: Telephone number of facility
- Municipality: Municipality that facility is located in
- County: County that facility is located in
- PADEP Subbasin: State Water Plan watershed identifier
- NHD Identifier:
- Latitude Degrees: Latitude degrees from permit
- Latitude Minutes: Latitude minutes from permit
- Latitude Seconds: Latitude Seconds from permit

- Longitude Degrees: Longitude degrees from permit
- Longitude Minutes: Longitude minutes from permit
- Longitude Seconds: Longitude seconds from permit
- Latitude: Decimal degrees calculated from permit
- Longitude: Decimal degrees calculated from permit
- Arclongitude: Decimal degrees to use for GIS
- Field Verified: Was the lat and long verified in the field?
- Corr Lat Degrees: Field verified latitude degrees
- Corr Lat Minutes: Field verified latitude minutes
- Corr Lat Seconds: Field verified latitude seconds
- Corr Long Degrees: Field verified longitude degrees
- Corr Long Minutes: Field verified longitude minutes
- Corr Long Seconds: Field verified longitude seconds
- USGS Code: USGS quad that the facility is located in
- SIC Code: SIC code for the facility
- Waste Type: Facility waste type (Sewage, Industrial, Other)
- Major NPDES Discharger: Is the facility a major waste discharger?
- Type of Facility: Is the facility a single family, power plant, or other?
- Design Flow: Permitted waste flow in million gallons per day
- Receiving Waters: Name of water that receives waste flow
- R-Stream Code: Code for water that receives waste flow
- Designated Use: Designated use of water that receives waste flow
- HQ-CWF: Is the receiving water a high-quality cold water fishes?
- Flow (Q7-10): Q7-10 of the receiving water
- Secondary Waters: Name of secondary water
- S-Stream Code: Code for secondary water
- Sec Designated Use: Designated use for secondary water
- Flow 2 (Q7-10): Q7-10 for secondary waters
- DMR Start month: Start month to determine average flow
- DRM Start Year: Start year to determine average flow
- DMR Finish Month: End month to determine average flow
- DMR Finish Year: End year to determine average flow
- Receiving Waters Comment: Any comments on the facility

**The following parameters will be collected and entered for each month for the past five years of record, if available/applicable:

- Monthly average flow: average flow from facility for one month duration based on daily/weekly measurements.

- Maximum flow: maximum discharged flow recorded for the month.

- Analysis frequency: daily/weekly

- Sample type: metered/measured

Procedure

Obtain download of pre-existing data in the Pa. DEP eFACTS database. Populate DMR database with data from eFACTS using directions provided in the users' manual. Cross-reference permit list from eFACTS with existing Pa. DEP NPDES master spreadsheet to assure all permits for which data need to be collected will be reviewed. Travel to appropriate Pa. DEP office. Obtain paper copies of Water Quality Protection Report (or equivalent document) from NPDES permit and DMRs from the previous five year time period. Open the appropriate data entry form in the database (new or existing). Enter and verify all available data contained in NPDES permit. Enter discharge data from DMRs. Update the master database file with any local database files at least weekly.

Quality Control and Quality Assurance

All persons collecting data using this SOP will receive training from both the project manager and the Access database owner. Five (5) percent of all data entries into the Access database will be selected at random and checked by the project manager.

Appendix B. STANDARD OPERATION PROCEDURE (SOP) FOR GPS DATA COLLECTION

Procedural Section

1.0   Scope & application

    1.1   This method is applicable to collecting point, line or area features on the ground in areas of no canopy to areas of forest canopy.

    1.2   The method is applicable for collecting data with location accuracy of 2.5 – 7.8 meters.

2.0   Summary of method

    2.1   NPDES location data will be collected as point locations using hand-held GPS receivers. The data will be stored as latitude and longitude coordinates and will be post-processed, differentially corrected.

3.0   Interference

    3.1   Poor satellite geometry or canopy may result in the inability for the GPS unit to receive signals. The GPS unit can be configured to permit more signals to be received (see 5.4). Care should be taken to not introduce significant error.

4.0   Apparatus

    4.1   Trimble GeoExplorer XT w/ TerraSync GPS receiver unit with external antennae

    4.2   Trimble GeoExplorer 3 GPS receiver unit with external antennae

    4.3   Trimble Pathfinder Office software

5.0   Procedure

    5.1   Create a data dictionary for data collection using Trimble's Pathfinder Office software's Data Dictionary Editor.

    5.2   Pre-plan data collection session using Trimble Pathfinder Office software.

    5.3   Charge GPS receiver unit battery.

    5.4   Configure GPS receiver unit:
        6.41   PDOP Mask: 8
        6.42   SNR Mask: 6
        6.43   Elevation Mask: 15
        6.44   Position Mode: 3D Manual

        6.45   System: Latitude/Longitude

        6.46   Datum: NAD83

        6.47   Degrees: DD.ddd

        6.48   Units: Meters

        6.49   Logging Interval (point): 1 second, minimum 120 positions

5.5   At first NPDES location, collect data for 20 minutes to insure that the current almanac is stored.

5.6   Collect 120 positions for each NPDES location and update feature attribute value.

5.7   Download data.

5.8   Differentially correct using local base stations

5.9   Export the data into ArcGIS shapefile/coverage.

Quality Control and Quality Assurance

1.0   Following the guidelines in 5.0 Procedure, collect one point position daily in a known location with canopy using the Trimble GeoExplorer XT and GeoExplorer receiver units. After differential correction, compare the location of the two positions. Further, compare the collected position data to the appropriate USGS topographic quad and/or Digital Ortho Quadrangle in ArcGIS.

Reference

1.0   United States Department of Agriculture Forest Service. 2000. *Comparison of GPS Receivers under a Forest Canopy with Selective Availability Off.* 21 pp.

2.0   Gardiner, N. *GPS Collection and Uploading Procedures.* University of Georgia, 7 pp.