

# **BASMAA Regional Monitoring Coalition**

## **Creek Status Monitoring Information Management System**

### ***Draft Roles and Responsibilities Memorandum***

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Bay Area Stormwater Management Agencies Association

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# 1.0 INTRODUCTION

Creek status and long-term trends monitoring is required by provision C.8.c and C.8.e of the Municipal Regional Permit (MRP). Monitoring required by these provisions is being designed by the Bay Area Stormwater Management Agencies Association (BASMAA) Regional Monitoring Coalition (RMC). As data are collected they will need to be stored and managed in a cost effective manner that allows quality control measures to be conducted and data users to easily access and query data and information. A Regional Project Profile was submitted to BASMAA on September 1, 2010 for the development of a Creek Status Monitoring Information Management System (IMS) to manage data collected in compliance with the MRP. The project profile, which contained seven tasks, was approved October 2010. The entire project profile is attached (Attachment A) and the seven tasks are listed below:

- Task 1: Develop IMS Work Plan
- Task 2: Evaluate Existing Tools Available
- Task 3: Reconcile MRP Requirements with SWAMP Data Submittal Formats
- Task 4: Develop Information Management Roles and Responsibilities
- Task 5: Develop Database and Import/Export Tools
- Task 6: Develop Technical User Guidance
- Task 7: Project Management

This Roles and Responsibilities Memorandum fulfills Task 4 of the Project Plan.

## 1.1 *Background*

The San Francisco Bay Regional Water Quality Control Board issued the Municipal Regional Stormwater Permit (MRP) to 76 cities, counties and flood control districts (i.e., Permittees) on October 14, 2009. The MRP provision C.8 requires Permittees to conduct water quality monitoring activities including Creek Status Monitoring (C.8.c) and Pollutants of Concern and Long Term Trends Monitoring (C.8.e). Representatives to the RMC have developed a Multi-Year Work Plan that identifies projects to assist Permittees in complying with MRP monitoring requirements. Several projects have been identified to implement the Creek Status Monitoring and Long-Term Trends Monitoring, including:

- Project 3a: Creek Status and Long-Term Trends Monitoring Design
- Project 3b: Standard Operating and Data Quality Assurance Procedures
- Project 3c: Creek Status Monitoring Coordination
- Project 3d: Creek Status Monitoring Field Work and Laboratory Analyses
- Project 3e: Creek Status and Trends Information Management System Development
- Project 3f: Laboratory Contract Language and Reporting Formats
- Project 3g: Creek Status and Trends Information Management and Quality Control

This memorandum pertains to Project 3e, which will develop a Creek Status and Trends IMS for the RMC. The IMS serves several purposes, the primary of which is to provide a mechanism for

sharing data among RMC participants. Data sharing is required if the RMC intends to produce an integrated regional assessment of Bay Area creeks. An additional impetus is MRP Provision C.8.h, which requires Permittees to submit monitoring data to the Water Board in SWAMP comparable formats and make available through a regional information management center, Permittee or Program website.

The BASMAA Regional Project Profile and the Draft Creek Status Monitoring Information Management System Work Plan (dated December 12, 2010) outline the process by which the Creek Status and Trends IMS will be developed, including the coordination with other RMC projects. In general, the standardized information developed through other projects will factor directly into the IMS and database structure. In addition, the roles and responsibilities of RMC project participants and centralized data management staff will affect the work flow of the IMS, the database structure and the quality assurance and standard operating procedure development. Therefore, this Draft Roles and Responsibilities memorandum was developed prior to the IMS Work Plan, the standard operating procedures and data quality assurance procedures being finalized.

## **1.2 Information Management System (IMS) Objectives**

The Creek Status Monitoring IMS is not just the development of a database, rather it is the entire process of managing data - from field collection, to data entry and review and reporting. In fact, before a database can be designed, key decisions need to be made regarding the role of a centralized database manager, responsibilities of data generators, responsibilities of data coordinators, Stormwater Program's access to data, standardized field forms, standardized laboratory electronic data deliverable (EDD) files, quality assurance and quality control and standardized key program, site, location and sample identifiers for the IMS database and comparison with other data sources (e.g. POC monitoring data).

This memorandum identifies the agreed upon workflow, and roles and responsibilities for RMC participants with regard to managing Creek Status and Trends monitoring data. The primary purpose of the IMS is to provide a mechanism for sharing data among RMC partners to produce an integrated regional assessment of Bay Area watersheds. The IMS will also meet MRP regulatory requirements to maintain an information management system that can transfer data in a format compatible with SWAMP (MRP Provision C.8.g.ii). The workflow, roles and responsibilities of the IMS are proposed for the types of data collected identified in the Draft Work Plan.

## **2.0 APPROACH**

### **2.1 Data Types**

The Draft RMC Creek Status Monitoring IMS Work Plan identified several types of data that will be collected to meet the MRP requirements. These data types are:

- Chemistry (water and sediment)

- Toxicity (water and sediment)
- Algae Taxonomy
- Benthic Macroinvertebrate (BMI) Taxonomy
- Physical Habitat
- General Water Quality Field Measurements
- Continuous Monitoring (sonde and temperature data logger)
- Stream Survey

These data types are listed separately because of the potential differences in how data are collected, electronically managed and reported. In the following sections, the work flow and roles and responsibilities are presented for each of these data types.

## **2.2 IMS Positions**

The creek status and trends IMS is a cooperative effort among RMC participants. To meet the objective of a regional, centralized IMS, local and centralized data management team members need to be identified by RMC participants to fill the following positions associated with information management:

- **Field Crews:** participating stormwater program staff, consultants or contractors who complete paper field forms, chain of custodies, and take field measurements or collect samples.
- **Contract Laboratory:** accredited environmental laboratories and taxonomists that receive samples from field crews and provide chemistry, toxicity or taxonomy results to information coordinators. RMC participants may choose to contract with individual laboratories or as a group via BASMAA.
- **Local Program Information Management Coordinator (IMC):** for each participating stormwater program, the primary contact for communication with contract laboratory(s), field crews and the central data management team (i.e., Central QA Officer and Central IMC). Also, the coordinator of all data not managed by the central data management team.
- **Central Quality Assurance (QA) Officer:** the first half of the central data management team that reviews data submitted by field crews and local IMCs for compliance with QAPP(s) and the IMS central data field business rules.
- **Central Information Management Coordinator (IMC):** second half of the central data management team, which uploads submitted data to central databases, queries data, exports data, calculates metrics and manages stored data.
- **Regional Report Preparer:** The project officer or designee (e.g., lead consultant or contractor) that oversees the preparation of the regional urban creeks monitoring report.

### **2.3 Data Flow**

Data flow processes are identified for each creek status monitoring data type based on the following four categories:

- Data generation (field collection and laboratory analysis);
- Electronic data entry;
- QA/QC review
- Submittal to a central data management system (if appropriate);
- Data storage;
- Transmittal of data to the Regional Board; and
- Data evaluation for regional reporting.

For each step in the selected data flow processes, the person or position and their responsibilities are identified in the following section. Guidance material or templates that will be developed by the RMC to assist with the roles are also identified (if applicable).

## **3.0 IMS ROLES AND RESPONSIBILITIES**

For each data type listed below, a data flow diagram that identifies the responsible party and the tasks associated with each step in the workflow. The steps include data generation, electronic data entry, QA/QC, data management/storage and reporting. Where applicable, it is indicated if a template will be developed through the IMS development project.

### **3.1 Chemistry**

Figure 1 illustrates the roles and responsibilities of each position described in Section 2.2 with regard to water and sediment chemistry. Water and sediment chemistry data will be stored in a central database. Field data from field crews and data from contract laboratories will be forwarded to and reviewed by the Central QA Officer. Once reviewed and data quality objectives are achieved, data will then be entered into the central database by, or under the direction of, the Central IMC, who will in turn send Local IMCs exported data in a SWAMP comparable format for submittal to the Regional Water Board. The Central IMC will also provide water and sediment chemistry data to the Regional Report Preparer for interpretation and use in the Regional Urban Creeks Monitoring Report.

### **3.2 Toxicity**

Water and sediment toxicity data will follow the same data flow as water and sediment chemistry (Figure 1). Field data from field crews and data from contract laboratories will be forwarded to and reviewed by the Central QA Officer. Once reviewed and comparisons to data quality objectives are made, data will then be entered into the central database by, or under the direction of, the Central IMC, who will in turn send Local IMCs exported data in a SWAMP comparable format for submittal to the Regional Water Board. If toxicity data are also to be included and interpreted in a regional report, the Central IMC will also provide data to the Regional Report Preparer.



### **3.3 *Algae and Benthic Macroinvertebrate Taxonomy***

Algae and benthic macroinvertebrate taxonomy data will follow the same data flow as water/sediment chemistry and toxicity data (Figure 1). Field data from field crews and data from contract laboratories (taxonomists) will be forwarded to and reviewed by the Central QA Officer. Once reviewed and comparisons to data quality objectives are made, data will then be entered into the central database by, or under the direction of, the Central IMC, who will in turn send Local IMCs exported data in a SWAMP comparable format for submittal to the Regional Water Board. The Central IMC will also provide algae and benthic macroinvertebrate taxonomy data to the Regional Report Preparer for interpretation and use in the Regional Urban Creeks Monitoring Report.

The Central IMC may utilize the CalEDAS database to perform QA on the benthic macroinvertebrate data submitted by the contract laboratory(s) and calculate metrics. However, the raw data, with all of the required SWAMP compatible data fields, will be stored and managed in a central database designed for this project.

### **3.4 *Physical Habitat***

Physical habitat data will also be stored in a central database, however, data flow differs slightly from sediment/water chemistry, toxicity and taxonomy data. As illustrated in Figure 2, the Local IMC will be responsible for entering the data collected in the field into an electronic template developed by the RMC, and calculating endpoints. The Local IMC will forward raw data and endpoints to the Central QA Officer for review. Once reviewed and comparisons to data quality objectives are made, endpoints will then be entered into the central database by, or under the direction of, the Central IMC, who will in turn send Local IMCs exported data in a SWAMP comparable format for submittal to the Regional Water Board. The Central IMC will also provide data for the Regional Report Preparer for interpretation and use in the Regional Urban Creeks Monitoring Report.

### **3.5 *Field Measurements***

Field measurements include data generated through general water quality grab samples taken during fieldwork. Field measurement data collected will follow the same general data flow process as Physical Habitat data (see Figure 2). The Local IMC will be responsible for entering the data collected in the field into an electronic template developed by the RMC. The data will be submitted electronically to a Central IMC, who will in turn send the Local IMC exported data in a SWAMP comparable format. The Local IMC then submits the electronic data to the Regional Water Board. The Central IMC will also provide data for the Regional Report Preparer for interpretation and use in the Regional Urban Creeks Monitoring Report.

### **3.6 *Continuous Monitoring***

Sonde and digital temperature logger data will be managed and stored locally. The Figure 3 data flow diagram details the roles and responsibilities of RMC participants. The Local IMC will be responsible for storing data electronically, calculating endpoints and submitting data to the

Regional Water Board. Continuous monitoring data will be reported by each local stormwater program in Local Urban Creeks Monitoring Reports.

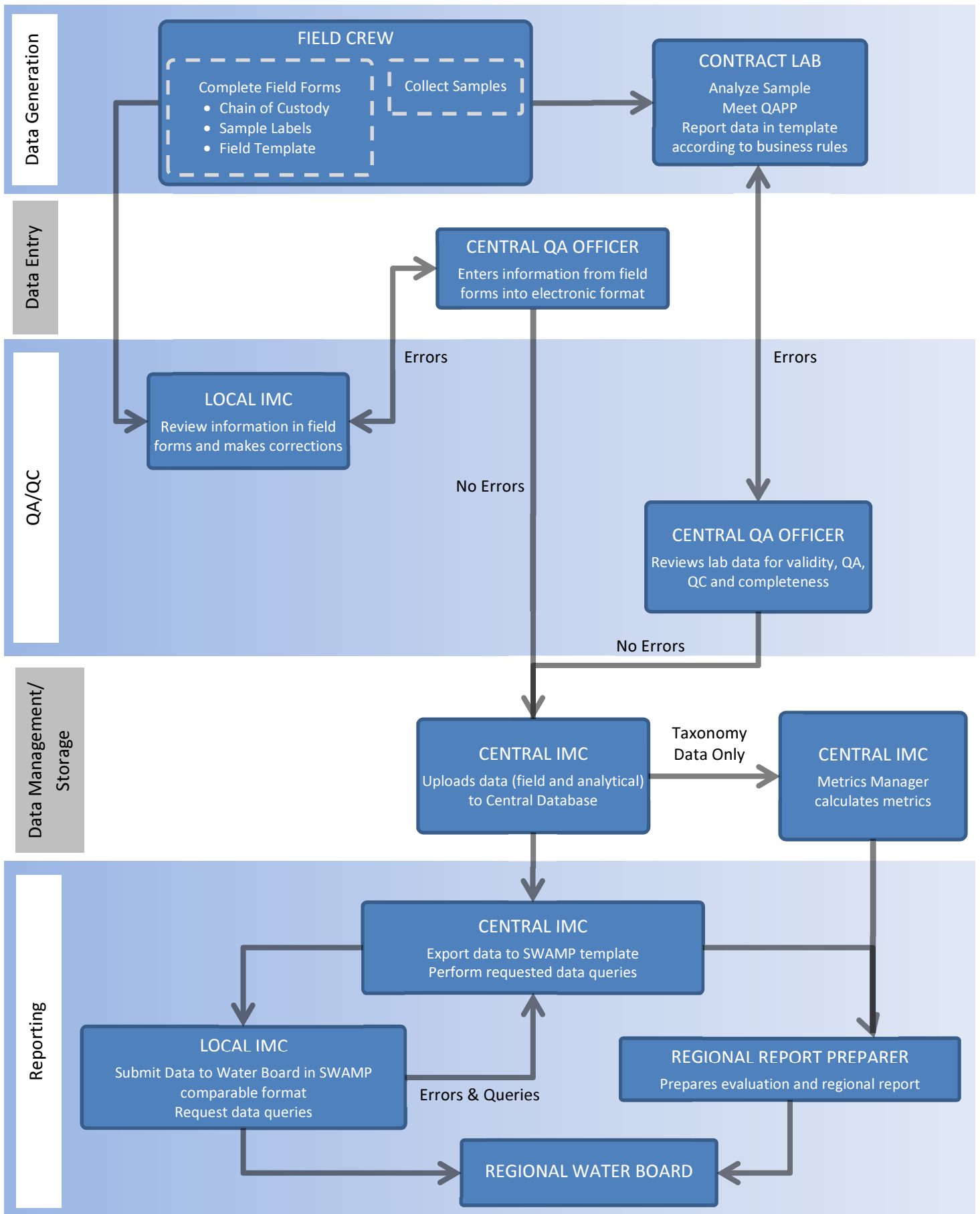
### **3.7 Stream Survey**

Data generated through stream surveys<sup>1</sup> will be managed and stored locally. The Figure 4 data flow diagram details the roles and responsibilities of RMC participants. The Local IMC will be responsible for storing data electronically, calculating endpoints and submitting data to the Regional Water Board. Stream Survey data will be reported by each local stormwater program in Local Urban Creeks Monitoring Reports.

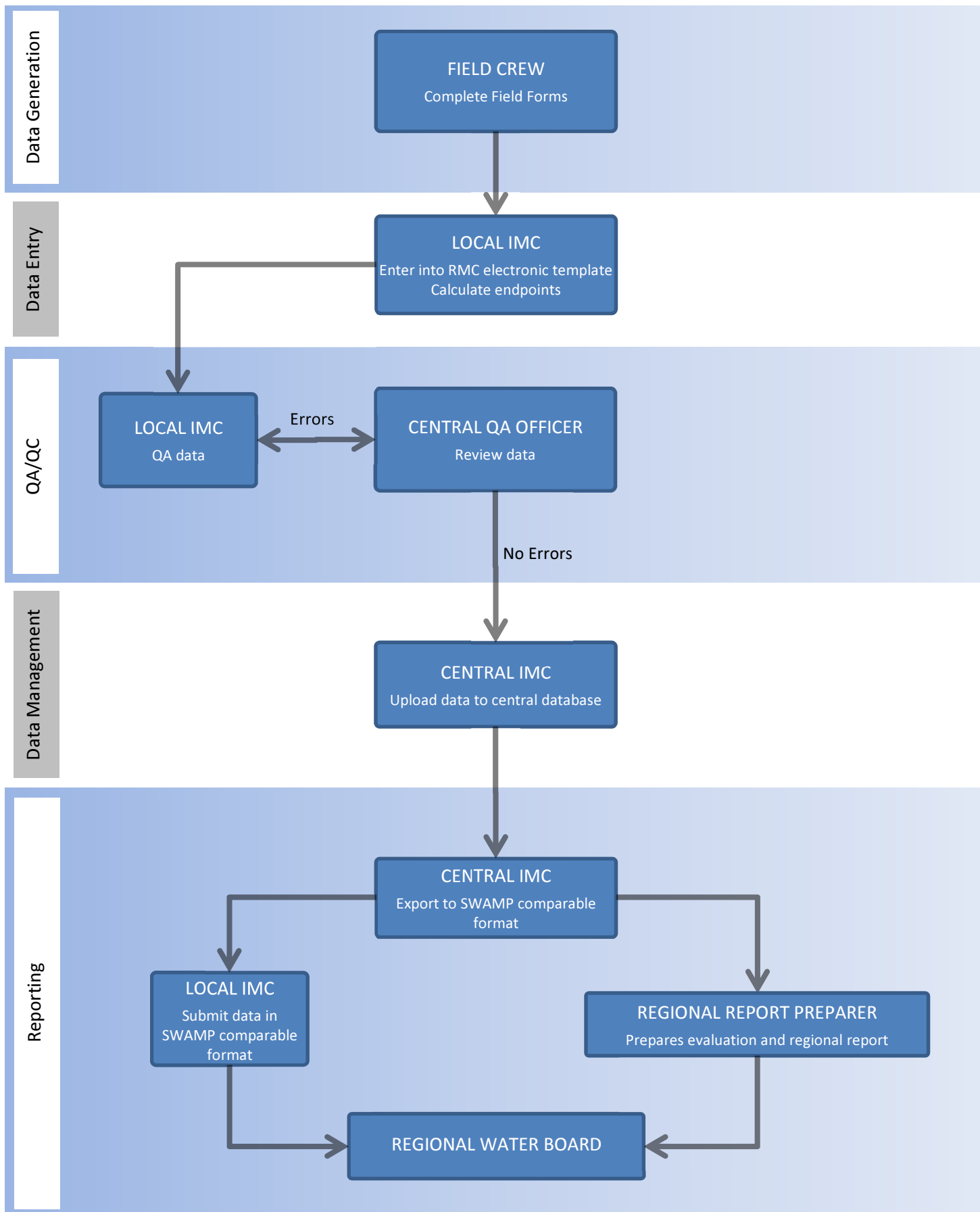
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<sup>1</sup> Methods used may include Unified Stream Assessment (USA), the California Rapid Assessment Method (CRAM) or equivalent.

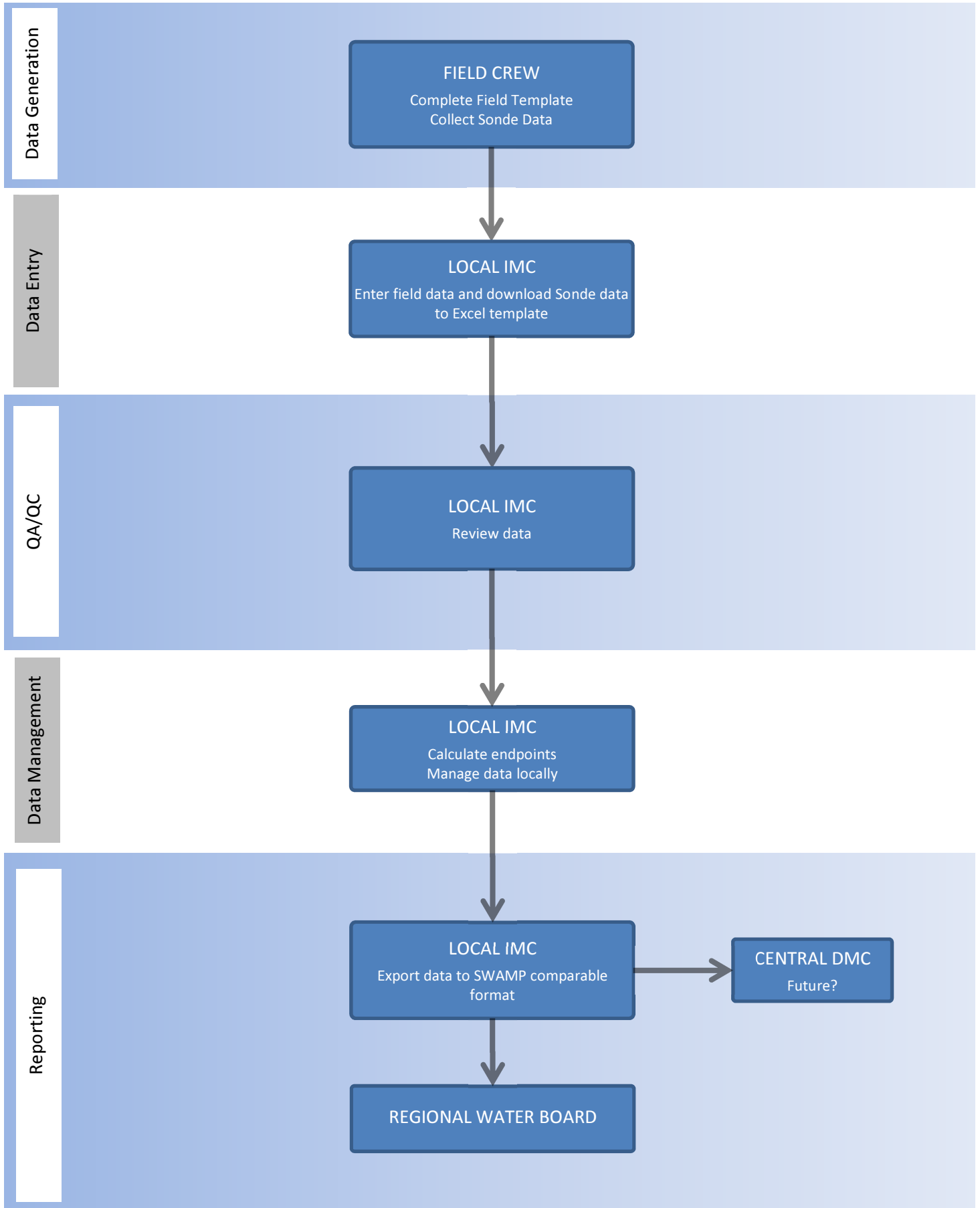
**FIGURE 1. CHEMISTRY, TOXICITY, AND TAXANOMY WORK FLOW**



**FIGURE 2. PHYSICAL HABITAT AND FIELD MEASUREMENT WORK FLOW**



**FIGURE 3. CONTINUOUS MONITORING WORK FLOW**



**FIGURE 4. STREAM SURVEY WORK FLOW**

