Construction Storm Water Excellence Initiative 2007

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Tennessee Department of Environment and Conservation

Division of Water Pollution Control

Quality Assurance Project Plan

(Note: According to EPA's guidance on QMP's and QAPP's, this is a non-conforming, memo-style QAPP, however, it adheres to guidance provided by the social scientists in OPEI.)

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QAPP DRAFT

1. Project Abstract

The State of Tennessee's 2006 303(d) List identified a number of waterbodies within the boundaries of many of the State's Municipal Separate Storm Sewer Systems (MS4s) as not fully supporting designated use classifications due to siltation and/or habitat alteration associated with urban runoff, land development activities, and streambank modification associated with construction. Siltation (sedimentation) is the most frequently cited cause of waterbody impairment in Tennessee, impacting over 5,800 miles of streams and rivers. Excessive sediment loading from land disturbance and construction activities in MS4s is a major ecosystem stressor and has adversely impacted municipal stream biota, either directly or through changes to physical habitat.

Under CFR 122.44(s), TDEC can formally recognize a MS4 as a Qualified Local Program (QLP) that has been shown to meet or exceed the provisions of the construction general permit. A QLP would be an MS4 that attains a demonstrated program quality beyond that of the normal, compliant, MS4. Therefore, in a further effort to reduce siltation and improve water quality, TDEC is developing criteria and incentives for MS4s to become QLPs. The goals of this program include:

1. MS4s find the QLP option desirable and apply for and are accepted as QLP's, both in the initial pilot and in the widescale rollout later. In seeking acceptance, the MS4s take actions to meet or exceed the provisions of their construction general permit.

2. The QLP option leads to greater efficiency among participants and TDEC

3. Water quality protection under the QLP option is at least as good as non-QLP's under direct TDEC supervision, as demonstrated by maintenance of effective QLPs and by TDEC's ability to allocate resources away from QLP jurisdictions and related construction activities.

2. Definitions

Municipal Separate Storm Sewer System (MS4)- Municipal Separate Storm Sewer (MS4) is defined at 40 CFR §122.26(b)(8) and means a conveyance or system of conveyances (including roads with drainage systems, municipal streets, catch basins, curbs, gutters, ditches, man-made channels, or storm drains):

(i.) Owned or operated by a State, city, town, borough, county, parish, district, association, or other public body (created by or pursuant to State law) having jurisdiction over disposal of sewage, industrial wastes, stormwater, or other wastes, including special districts under State law such as a sewer district, flood control district or drainage district, or similar entity, or a designated and approved management agency under section 208 of the CWA that discharges to waters of the state;

(ii.) Designed or used for collecting or conveying stormwater;

(iii.) Which is not a combined sewer; and

(iv.) Which is not part of a Publicly Owned Treatment Works (POTW) as defined at 40 CFR §122.2.

A **Designated MS4** is an MS4 whose discharges must be permitted under the State of Tennessee's NPDES Permit.

National Pollutant Discharge Elimination System (NPDES) general permit- for small municipal separate storm sewer systems (MS4s). It authorizes discharges from small MS4s located throughout the State of Tennessee. There are two discrete small MS4 entities: currently permitted MS4s renewing their coverage and newly identified MS4s designated by the director of Division of Water Pollution Control including specific state college and university campuses with on-campus housing.

Participant- for the purposes of this QAPP, a participant is an MS4 that has volunteered and qualified to take part in the QLP Pilot Program.

Non-participant-for the purpose of this QAPP, a non-participant, is an MS4 that either did not volunteer or did not qualify to take part in the QLP Pilot.

Pilot Program- would be a period where TDEC will work with select MS4(s) volunteer(s) program(s)to work through guidance materials and document achieving the various elements involved in becoming a qualified program.

Qualified Local Program (QLP)- is an MS4 stormwater management program for discharges associated with construction activity that has been formally approved by the division as having met specific minimum program requirements, including those identified in 40 CFR 122.44(s). The intent of the QLP is to establish a streamlined and efficient process for managing discharges of stormwater associated with construction activities by eliminating duplication of the effort between the MS4 and the Division.

Quality Assurance Program Plan (QAPP) - This is a guidance document written to assure the quality of the collection of any primary or secondary data related to this project. According to EPA's guidance on QMP's and QAPP's, this is a non-conforming, memo-style QAPP; however, it adheres to guidance provided by the social scientists in OPEI.

Respondent- for the purposes of this QAPP, a respondent is an MS4 that receives and responds to the survey developed under this QAPP.

Non-respondent- for the purposes of this QAPP, a non respondent is an MS4 that does not respond to the survey developed under this QAPP.

3. Measurement Approach Overview and Purpose

We intend to conduct three surveys of stormwater programs throughout the State in order to understand:

- The extent to which their attitudes about QLPs have changed over the course of the project.
- The extent to which project participants have changed their stormwater-related policy activities (i.e., behavior) relative to non-participants. Example: Number of inspections.
- The extent to which the rate of complaints changes over time for QLP participants (perhaps relative to non-participants), to help judge whether environmental protection is being maintained.

Participation in the pilot program will be voluntary. Participation will be limited to MS4's that meet the minimum criteria developed as part of this initiative. Therefore we do not have a pre-determined pilot group size. The participants in the pilot program will be qualified volunteers from the approximately 100 designated MS4's in Tennessee. We will use the information collected to gauge the extent to which the pilot program has been successful, in order to judge whether the QLP elements tested and demonstrated during the pilot warrant using the QLP option in Tennessee, or if these elements need to be adjusted or modified prior to making the QLP option available to the remainder of the qualified MS4 population in Tennessee.

This data collection is authorized by EPA ICR 1755.08.

4. Detailed Description of Measurement Approach (Primary Data)

There is one primary data source: surveys of the designated MS4s throughout the state. We intend to use a web-based survey form:

- Data will be collected three times: prior to the beginning of the pilot period; during the pilot period, shortly after participants begin implementing aspects of being QLPs; and near the conclusion of the project period. The pilot period would be a period where TDEC will work with select MS4(s) volunteer(s) program(s)to work through guidance materials and document achieving the various elements involved in becoming a qualified program. We will monitor the designated Qualified Programs. Surveys will be approximately one year apart from each other. It is expected that the most valuable data with regard to behavior change and environmental outcomes will be collected in the final survey, allowing some time for the potential benefits of QLP participation to take hold.

- Anticipated length of survey response time is less than 30 minutes; respondent should allow additional time to access records in preparation for the survey.

- Since MS4s are familiar with MTAS surveys, MTAS should conduct the survey. The stormwater program contact for each MS4 in Tennessee will receive the survey.

- We do not intend to use statistical analysis to make projections, as we intend to collect data from the entire relevant population of stormwater program contacts in the State.
- Specific measures that we will use the data to support will include percent of facilities achieving a desirable behavior or attitude change, improvement in complaint levels.
- The MTAS document: Surveying Citizens: A Handbook for Municipal Officials Who Want to Know What Their Citizens Think by David Folz will be used as supplemental guidance to conduct the surveys and prepare the reports, with guidance from EPA staff, contractors, and social scientists being primary.

5. Secondary Data Sources

Secondary data sources would include TDEC complaint records and enforcement data. TDEC complaint records are expected to be combined with information from the MS4s about their complaint levels, to get an accurate picture of the complaint rate for each MS4. We define complaint rate as the total number of complaints received by TDEC or the MS4 regarding stormwater-related construction activities in a particular MS4's jurisdiction divided by the total number of stormwater-related construction permits on record, for each fiscal year.

6. Quality Assurance Procedures

Prior to Data Collection:

The following approach will be undertaken to minimize potential bias during survey planning:

The survey methodology has been carefully vetted by TDEC, MTAS, and EPA staff and contractors, including a social scientist, to reduce the possibility of bias in the survey instrument. All questions were carefully examined in this context.

All stormwater programs across the State will be invited to participate in the survey to avoid bias in selecting (or “cherry picking”) respondents.

Additionally, the survey methodology will be reviewed by the QLP Advisory Committee, which is comprised of representatives from various stakeholder groups, including: stormwater programs (MS4s), the Home Builder’s Association, the Association of General Contractors, environmental advocacy groups, TDEC, the Tennessee Department of Transportation, the Tennessee Chamber of Commerce, the Tennessee Stormwater Association, and others. We feel that the benefits of getting comments from a small number of MS4 stormwater contacts outweighs any limited, potential bias that might be caused by their reviewing the survey in advance of providing formal responses during the official survey process.

The UT-MTAS Library, the component of MTAS which will administer the surveys, conducts numerous statewide surveys on an ongoing basis. Their experience should help ensure minimal problems in implementation.

During Data Collection:

As stated above, rather than random sampling, we intend to use the entire set of permitted stormwater programs in the State of Tennessee.

MTAS has a standard follow-up protocol for tardy respondents:

- first time: an email reminder
- second time: another email reminder
- third time: a reminder by telephone

Mayors are included in our contact list and will be requested to encourage staff to complete surveys, if needed, as a last resort.

The surveys will be in electronic, interactive format. Data entry will be cross-checked and peer-reviewed for the distillation, summarization, and analysis and reporting. The results will be shared with TDEC and EPA and stored according to EPA policy.

After Data Collection:

We do not need to use inferential statistical techniques because we are conducting a census. Instead, we will be using descriptive statistics to characterize results from the respondents.

We will separately examine the data for the program participants and program non-participants to understand how the metrics are changing for each.

With regard to attitudes, this will help us understand the impact of the project and project-related outreach on both groups.

With regard to behavior changes and efficiency/complaint outcomes, comparing the trends between program participants and program non-participants will help understand if any observed changes among program participants are very different from what's happening among program non-participants. This can help reduce or eliminate potential biases (such as the slowdown in the economy, which might make permits go faster and complaints decrease, just because there are fewer projects).

With regard to checking for data quality, we will attempt to characterize non-respondents in terms of counts of types of non-respondents, looking at typing categorizations such as population size, per capita income, grand division of the State (West, Middle, East), overall program evaluation by their local TDEC field

office, etc., and characterizing questions for which there is a poor response rate or data quality is otherwise poor.

7. Impact of Relevant Data Quality Issues

Precision:

For the questions, are they phrased appropriately to be understood well?

The survey methodology has undergone peer review.

Sensitivity:

Are the questions sufficiently detailed enough to be of analytical value?

We have considered sensitivity issues in designing the survey and believe we have an appropriate balance of sensitivity and practicality. For instance, we are collecting complaint data on a fiscal year basis, primarily because it is consistent with state/MS4 records, but it should still be sensitive enough to detect moderate trends. We believe that the vetting process with TDEC, EPA, MTAS, and stakeholder representatives on the QLP Advisory Committee will ensure this.

Representativeness:

Will the survey be conducted within a representative group?

Yes. We are conducting a census of all MS4 stormwater program contacts in the State.

Completeness:

Could a large number of non-respondents to the survey create a lack of representativeness?

Yes.

Is this expected?

No. MTAS follows up with respondents with a progressive level response protocol, as mentioned earlier, and has a very successful track record. If necessary, our primary contacts for each city includes the mayor, who can usually motivate staff the complete the surveys.

Can it be mitigated?

In the event of any non-response, we will characterize the non-respondents according to several different kinds of characteristics and assess the extent to

which we believe overall results may be biased. These findings will be provided with any reports of results.

We will use such categorizations as population size, per capita income, grand division of the State (West, Middle, and East), overall program evaluation by their local TDEC field office, etc. These strata will be reviewed for commonalities or patterns.

Further, we have designed the survey checklist to attempt to minimize item non-response, by limiting the amount of time that answering a survey will take and injecting design elements that are intended to engage the survey population. Potentially sensitive questions have also been placed closer to the end of the survey. Upon completion of surveys, we will examine the data for item non-response and characterize questions for which there is a poor response rate or data quality is otherwise poor.

Comparability:

Do you anticipate making comparisons among groups or over time?

Yes.

Will your approach be sufficiently consistent to allow for such comparisons? Will you be tracking factors that might complicate comparison (e.g., changing regulatory or economic factors can influence comparability over time).

Yes. As stated above, with regard to behavior changes and efficiency/complaint outcomes, comparing the trends between QLP participants and non-participants will help understand if any observed changes among QLP participants are very different from what's happening among non-participants. This can help reduce or eliminate potential biases (such as the slowdown in the economy, which might make permits go faster and complaints decrease, just because there are fewer projects). We also intend to share preliminary results with our stakeholders in order to solicit feedback in terms of interpreting the results and understanding potential biases.

Please note that, because some MS4s will transition into QLP status over the course of the project, we will slightly alter the survey checklist for these MS4s to ensure they will interpret it properly. In making these alterations, we will ensure that data will be comparable to prior responses and to MS4s that have not become QLPs. (All versions of the survey are provided as attachments.)

Bias:

Have you addressed potential biases, such as a self-reporting bias?

Because we are largely relying on self-reported information, we cannot substantially remove self-reporting bias. However, we do believe that the survey delivery method and survey design will mitigate self-reporting bias because of the assurances of identity protection. Further, self-reporting is vital for much of the attitudinal information being collected.

Can you mitigate it in some way, such as by promising anonymity or verifying responses?

Yes. We are promising anonymity and conducting the survey through MTAS, which is a third party, non-regulatory agency that *has a pre-existing role as a source of technical support and assistance to the respondents. We will also look to see if there is some sort of self-selection bias. By that, we mean whether the participants, by their nature, are very different than nonparticipants and likely to have different outcomes as a result. This might be more of a qualitative assessment.*

8. Project Management

The Tennessee Grant Project Coordinator will be responsible for overseeing the data collection process and ensuring that consistent practices are implemented. MTAS's QA Officer and the Tennessee Grant Project Coordinator will conduct QA on the data entered prior to any analysis.

Table 1: Project Implementation Personnel

Individual	Role in Project	Organizational Affiliation
Frances Adams-O'Brian	Project Survey Administrator	UT-MTAS
John C. Chlarson, P.E.	Project Survey Quality Assurance Officer	UT-MTAS
Robert Karesh	Tennessee Grant Project Coordinator	TDEC
Sean M. Flynn	EPA Grant Manager	US EPA Region 4
Gerald J. Filbin, Ph.D.	Director, Innovative Pilots Division, NCEI, EPA	US EPA HQ

9. Assessment/Oversight

Assessment and Response Actions

MTAS's Project Survey QA Officer will conduct a readiness review prior to primary data collection. The MTAS Project Survey QA Officer will report findings to the Tennessee Grant Project Coordinator, who will take corrective action, as necessary. Corrective action will be pre-approved by the MTAS Project Survey QA Officer. Collection of primary data will not begin until the MTAS Project Survey QA Officer certifies readiness. The Tennessee Grant Project Coordinator and MTAS Project Survey QA Officer will meet regularly with other project implementation staff to identify emerging/unanticipated problems and take corrective action, if necessary.

Reports to Management

Three kinds of reports will be prepared during the grant period of performance: readiness reviews (described above), regular quarterly progress reports, and a final report. Progress reports will note the status of project activities, identify any QA problems encountered, and explain how they were handled. The final report will analyze and interpret data, present observations, draw conclusions, identify data gaps, and describe any limitations in the way the results should be interpreted.

Table 2: Reporting

Type of Report	Frequency	Preparer	Recipients
Readiness Review	Before each major data collection task (specifically, before each survey)	MTAS Project Survey QA Officer	Tennessee Grant Project Coordinator
Progress Report	Quarterly	Tennessee Grant Project Coordinator	EPA Grant Manager (Copying US EPA OPEI)
Final Project Report	Once	Tennessee Grant Project Coordinator	EPA Grant Manager (Copying US EPA OPEI), QLP Advisory Committee stakeholders