New Mexico Environment Department (NMED) Surface Water Quality Bureau (SWQB)

Standard Operating Procedure (SOP) for

PROBABLE SOURCE(S) DETERMINATION

Approval Signatures

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1.0 Purpose and Scope

The purpose of this document is to describe the process of 1) developing a qualitative list of probable sources of impairment for Total Maximum Daily Loads (TMDLs), TMDL Alternatives (ALTs), and other planning documents; 2) reviewing these lists through both internal and public processes; and 3) incorporating this information into subsequent Clean Water Act (CWA) §303d/§305b Integrated Reports (IR). This approach is intended only to provide a qualitative list of probable sources using the available probable source list in Appendix A.

2.0 Personnel Responsibilities

The SWQB personnel who develop TMDLs or TMDL ALTs, or work with watershed groups in developing Watershed-based Plans (WBPs), as well as those who supervise these individuals are responsible for implementing this procedure. The SWQB personnel working under this SOP are required to sign an acknowledgment form that they are familiar with the SOP and will implement the procedures as detailed in this SOP.

The Monitoring, Assessment, and Standards Section (MASS) Program Manager, along with the Quality Assurance Officer (QAO), and Subject Matter Expert (SME) will determine if any revisions to this SOP are needed at a minimum of every two (2) years in accordance with SOP 1.1 Creation and Maintenance of SOPs (NMED/2020).

The QAO:

- is involved in the development and revision of this SOP to ensures SOP meets the requirements of the SWQB's Quality Assurance Project Plan (NMED/SWQB 2018), and
- pending the review and approval of the SOP, the QAO will ensure the SOP is accessible through the SWQB's website.

The MASS Program Manager:

- provides input on the scope and intent of this SOP as it pertains to the program's goals and objective, and
- reviews updated SOP before approval.

The TMDL and Assessment Team Supervisor is considered the Subject Matter Expert (SME) for this SOP. The SME:

- reviews existing SOP every two (2) years and updates the SOP as the procedure or equipment changes in coordination with QAO and MASS Program Manager,
- reviews draft Probable Source lists in TMDLs before review and approval from Water Quality Control Commission (WQCC), and
- uploads Probable Source lists from EPA-approved TMDLs into the SWQB's in-house Surface Water Quality Information Database (SQUID).

The TMDL Lead:

- creates draft Probable Source list utilizing various tools and procedures,

- and incorporates the submitted public comments regarding probable sources for TMDLs or TMDLs ALTs as needed before WQCC and EPA approval.

The Assessment Coordinator utilizes SQUID to generate a statewide Probable Source category summary for the CWA §303(d)/§305(b) IR.

The Watershed Protection Section (WPS) uses the Probable Source list to inform WBPs using CWA § 319(h) funding administered by the U.S. Environmental Protection Agency (EPA).The WPS utilizes the *Nonpoint Source Program and Grants Guidelines for States and Territorie*s (EPA 2013a) to develop WBP projects in accordance with the H*andbook for Developing Watershed Plans to Restore and Protect Our Waters* (EPA 2008). Element (a) of the nine elements detailed in Handbook states WBP are required to demonstrate the following: "*Identification of causes of impairment and pollutant sources or groups of similar sources that need to be controlled to achieve needed load reductions, and any other goals identified in the watershed plan"*

3.0 Background and Precautions

3.1 Background

According to the 1998 CWA §305(b) report guidance, "…, states must always provide aggregate source category totals…" in the biennial submittal that fulfills CWA §305(b)(1)(C) through (E) (EPA 1997). "Sources" are defined as activities that may contribute pollutants or stressors to a waterbody (EPA 1997). All states must submit to EPA a description of the nature and extent of nonpoint source pollution as well as state-level summaries of causes and sources of impairment to waters (EPA 2005). The term "probable" to describe sources is specifically noted in Appendix A of the 2006 Integrated Report Guidance (EPA 2005).

Starting with the 2018 IR, states are required to electronically submit CWA §303d/§305b IR data to EPA's re-designed Assessment, Total Maximum Daily Load (TMDL) Tracking and Implementation System (ATTAINs)[1]. EPA maintains a standard list of probable sources with definitions in ATTAINs that states are required to utilize so the EPA can compile compatible source information from all states to generate national summary statistics (see Appendix A). As part of the ATTAINs re-design, there were several discussions between EPA and states regarding the reporting of probable sources since most states (including New Mexico) do not have adequate dedicated funding for rigorous source identification. In 2018, EPA Office of Water staff confirmed that submitting probable source data for all impaired assessment units (AUs) (i.e., IR Category 4 and 5) was optional and not a required CWA §303d/§305b submission data element in the re-designed ATTAINs. The SWQB currently documents probable source(s) of impairment(s) by AU in TMDLs and TMDL ATLs. The SWQB prioritizes the development of TMDLs using a priority ranking system detailed in the *Prioritization Framework and Long Term Vision for Water Quality in New Mexico* (NMED/SWQB 2015).

The SWQB tracks these probable source(s) of impairment(s) for AUs in TMDLs or TMDL ALTs in SQUID. Among other things, SQUID is used to generate a statewide probable source category summary for the

[1] https://www.epa.gov/waterdata/attains

IR and to upload required CWA §303d/§305b assessment metadata to ATTAINs. More detailed information on probable source(s) of impairment(s) may be provided in the text of the TMDL or TMDL ALTs as well as in additional watershed planning documents such as WBPs.

3.2 Precautions

There are usually multiple probable sources listed for any given cause in an impaired water body or assessment unit. This is because the probable sources list is intended to include any and all activities that are known to occur within the impaired assessment unit and have the potential to contribute to the identified cause of impairment. It is not intended to single out any particular landowner or land management activity and has therefore been labeled "probable." Probable sources listed for any particular assessment unit have not been verified to be the only sources of the identified impairment and all probable sources may not be listed.

3.3 Safety

This SOP does not cover actions or procedures that may pose specific safety issues beyond those found in a typical office environment.

4.0 Definitions

Assessment Coordinator – A MASS personnel member in the TMDL and Assessment Team supervised by the TMDL and Assessment Supervisor. The Assessment Coordinator is responsible for the identification and reporting of impaired waterbodies for the State of New Mexico in the CWA §303(d)/§305(b) IR.

Assessment Unit (AU) – In New Mexico's IR, AUs are designed to represent specific stream segments or water bodies with assumed homogeneous water quality (WERF 2007). Stream or river AUs in New Mexico are typically no more than 25 miles in length unless there are no tributaries or land use changes to consider along the reach (NMED/SWQB 2019).

ATTAINs — Is an EPA database which states, territories and authorized tribes utilize for reporting and tracking of the nations impaired waters. The Assessment, Total Maximum Daily Load (TMDL) Tracking and Implementation System (ATTAINS) is an online system which can be used for accessing information about the conditions of the Nation's surface waters.

Cause(s) of Impairment – Parameters or constituents that cause non-attainment of designated or existing uses (EPA 1997).

Monitoring Team staff- A MASS personnel member in the Monitoring Team who conducts water quality monitoring and is supervised by the Monitoring Team Supervisor.

Probable – Supported by evidence strong enough to establish presumption but not proof.

Probable Source(s) of Impairment – Activities that may contribute pollutants or stressors to a water body (EPA 1997).

Program Manager – An individual within the SWQB that manages a program such as the Watershed Protection Section (WPS), the Point Source Regulation Section (PSRS) or the Monitoring, Assessment and Standards Section (MASS).

Quality Assurance Officer (QAO) – Is the individual within the MASS that is responsible for overseeing the development and implementation of all quality assurance procedures and processes within the SWQB including those projects that receive support or funding from the SWQB.

Subject Matter Expert (SME) – A person who is familiar with the purpose and procedure for accomplishing the procedures detailed in this SOP. The SME may hold another title within the organization.

Standard Operating Procedure (SOP) – A document that lists the steps that should be completed when doing a task.

Surface Water Quality Information Database (SQUID) – The SWQB database for storing, retrieving and reporting environmental results which include laboratory results, field observations, biologic assemblage data, long-term datasets (LTD)summary data, and stream habitat/geomorphic data.

Total Maximum Daily Load (TMDL) – A document which defines the calculation of the maximum amount of a pollutant allowed to enter a waterbody so that the waterbody will meet and continue to meet water quality standards for that particular pollutant. A TMDL determines a pollutant reduction target and allocates load reductions necessary to the source(s) of the pollutant.

TMDL Alternative (ALT) – a TMDL ALT incorporates adaptive management and are tailored to specific circumstances where such approaches are better suited to implement priority watershed or water actions that achieve the water quality goals of each state, including identifying and reducing nonpoint sources of pollution (EPA 2013b). A TMDL ALT meets the requirements for both a TMDL and a WBP.

TMDL Lead – A MASS personnel member in the TMDL and Assessment Team who is directed to be the lead for a specific TMDL, TMDL ALT, and is supervised by the TMDL and Assessment Supervisor.

TMDL and Assessment Team Supervisor – An individual within the SWQB that manages the TMDL program and supervised by the MASS Program Manager.

Watershed Protection Section (WPS) – A section within the SWQB that administers three programs for the Bureau: The Nonpoint Source Program, Wetlands Program and the River Stewardship Program. The WPS develops WBPs under the Nonpoint Source Program.

Water Quality Control Commission (WQCC) – The WQCC is the water pollution control agency for NM and is responsible for developing specific water quality policy in NM, in a manner that implements the broader policies set forth by the Legislature in the New Mexico Water Quality Act.

5.0 Equipment

Computer with internet access and tools such as Google Earth, GIS, EPA Recovery Potential Screening (RPS) Tool (spreadsheets) and SQUID.

6.0 Probable Source Determination for Inclusion in TMDLs (Process Description)

Probable source lists are generated in draft TMDLs and TMDL ALTs to document *probable source(s) of impairment(s)* that may be contributing to the c*ause(s) of impairment* identified in the CWA §303d/§305b IR. The draft *probable* source list is developed using computer-based tools, such as GIS, remoting sensing and EPA Statewide RPS spreadsheets, combined with knowledge of land management activities in the contributing watershed that have the potential to negatively impact the parameter(s) of concern. The ATTAINs-compatible probable source categories, as well as relevant potential sources of GIS data, are provided in Appendix A.

GIS land use datasets produced by government agencies or academic institutions, and satellite imagery (i.e., Google Earth) will be used to develop the draft probable source list. Staff observation noted on field forms will also be considered. Additional tools such as the EPA Statewide RPS spreadsheet may be useful to generate a draft list. The draft probable source lists will be finalized with public as well as targeted watershed group/stakeholder input during the TMDL public comment period and meeting. Public input of probable sources received either before the TMDL goes out for public comment or during the TMDL process will be considered and incorporated as appropriate.

6.1 Probable Source process before TMDL development

a) During sampling events, Monitoring Team staff will select applicable Probable Sources from the Probable Source drop-down menu on the "stream/river field data form". The noted Probable Sources will populate in the "comments" section in the Field Data Report from SQUID. The list of Probable Sources on the field form will be a subset of those in Appendix A and will focus on sources that are not able to be identified via other sources.

6.2 Probable Source process during TMDL development

a) The TMDL Lead will download the "raw results" from SQUID (In SQUID: AdHoc Report > RIDs/QA > raw results) and note all Probable Sources included in the "ACTIVITY_COMMENTS" column for each sampling event in each AU addressed in the TMDL document under development.
b) The TMDL Lead will identify any NPDES permits in each AU addressed in the TMDL document and select the appropriate Probable Source category from Appendix A (e.g., municipal, industrial, CAFO, or MS4) that applies to the NPDES permit in the AU.
c) The TMDL Lead will review available precipitation records[2] to address the "drought related impacts" Probable Source.
d) The TMDL Lead will use ArcMap and Appendix A to review Probable Sources and to determine potential probable sources for the identified AU using the following steps:
    i. Delineate contributing drainage area polygons above SWQB station and AU of interest using StreamStats (basic GIS user) or ArcMap Hydrology tools (advanced user). This will

[2] NIDIS Drought Data Layers (https://www.drought.gov/drought/search/data)

allow GIS analysis of ALL land surfaces reasonably expected to influence the surface water body of interest.

ii. Import the SWQB station (point), AU (line), and associated contributing drainage areas (polygons) to ArcMap.

iii. Use the ArcMap "Buffer" tool to create polygons around the SWQB station (point) and AU (line). This will allow GIS analysis of PROXIMAL land surfaces reasonably expected to influence the surface water body of interest. (NOTE: The SWQB suggest a "nested buffer" approach of 10 m, 100 m and 1000 m. The SWQB staff who are familiar with AUs and experience in identifying potential probable sources can provide input that leads to standardizations of buffer width for different probable sources and/or regions of the state.)

iv. Use the contributing drainage area polygons and buffer polygons to evaluate relevant GIS data for each probable source. In most cases, this will require some or all of the following approaches:

   i. Visually inspecting aerial/satellite imagery for evidence of a probable source (e.g., cattle and game trails, low water crossings)

   ii. Selecting features from the relevant GIS layers that intersect the SWQB station and AU polygons, then evaluating the prevalence of features associated with probable sources in each SWQB station and AU polygon. (NOTE: This only applies to vector (i.e., point, line, polygon) data.)

   iii. Using ArcMap Spatial Analyst tools (e.g., tabulate area, zonal statistics as table) to evaluate the prevalence of features associated with probable sources in each SWQB station and AU polygon. (NOTE: This only applies to raster data.)

v. Datasets used to determine probable sources will be cited in the TMDL and will be clipped and saved with the contributing drainage area and AU buffer shapefiles. These files will be maintained by the TMDL Lead for inclusion in the TMDL Administrative Record.

e) The TMDL Lead will provide the draft Probable Source list to staff familiar with the AU(s) of concern based on their work with permits, watershed-based planning projects, or monitoring in the watershed for review and comment.

f) The Probable Source list for each AU will be listed in the TMDL Executive Summary tables as well as the Probable Source subsection in each parameter-specific TMDL section. Only Probable Sources applicable to each TMDL parameter will be listed in the parameter-specific TMDL section. For example, if "waste from pets" is identified as a Probable Source, it would be listed in the *E.coli* TMDL section and not included in the aluminum TMDL section.

g) Written Probable Sources received from stakeholders during the public meeting or public comment period will be incorporated into the TMDL as appropriate.

h) Additional Probable Sources requested by the WQCC or EPA before approval will be added to the final TMDL.

i) Once approved, the approved TMDL will be posted on the SWQB webpage (https://www.env.nm.gov/surface-water-quality/tmdl/). The TMDL and Assessment Team Supervisor ensures approved documents are posted in a timely manner.

6.3 Probable Source process following TMDL approval

a) Following EPA approval of the final TMDL, the TMDL and Assessment Supervisor will assign a TMDL ID and add the TMDL to ATTAINs as a new Action. However, the probable source field is not a required field in ATTAINs, so Probable Sources will not be included as part of TMDL uploads in ATTAINs.
b) Following the addition of the new TMDL Action to ATTAINs, the Assessment Coordinator will ensure SQUID is updated to reflect the TMDL additions to ATTAINS.
c) Once the SQUID is updated, the TMDL and Assessment Team Supervisor will assign each new TMDL Action and associated Probable Sources to the appropriate AU in SQUID.
d) During development of subsequent draft IRs, the Assessment Coordinator will download a source summary report from SQUID as follows: AdHoc Reports > Assessment > Source Summary. This SQUID-generated report is generally included as Appendix B of the IR.
e) The Assessment Coordinator will use this SQUID Report to generate statewide summary statistics for incorporation into the CWA §303d/§305b IR to fulfill the requirement of the CWA §305(b)(1)(E). A pie chart or similar graphic is typically generated to summarize the top impairment sources in rivers and stream. Standard EPA source categories (see Appendix A) included in SQUID have been used to label the graphic.

6.4 Public Comment and Input

The opportunity for public comment and input on probable source(s) of impairment is provided at multiple times during the process of collecting water quality data, performing water quality assessment, and writing TMDLs. These opportunities include but are not limited to providing:

1. Written public comment at watershed pre-survey meetings, TMDL public meeting or at any time by contacting SWQB directly; or
2. Public comment on Probable Sources listed in draft TMDL documents.

Public comments are incorporated into TMDL documents by the TMDL Lead as appropriate (see Section 8.0). The TMDL and Assessment Supervisor will verify that all applicable public comments have been included in draft probable source list before the TMDL document is approved by the WQCC.

Public participation requirements for the development of TMDL programs administered under the CWA are specified in 40 CFR 25.4. Additional information can be located in the SWQB Water Quality Management Plan/Continuing Planning Process (WQMP/CPP) section XIV (NMED/SWQB 2011).

7.0 Data and Records Management

Records related to TMDL and IR development are stored in the Administrative Record. The Administrative Record was historically maintained in paper files in the SWQB main office but resides electronically after November 2018. Record retention and management for the TMDL and IR programs is outlined in the November 2018 “TMDL Administrative Record Guidance” document available internally to SWQB staff.

For information and data regarding probable sources, cause of probable source, TMDL status, and IR Category by AU a report will need to be run in SQUID following the instruction below.

In SQUID go to: : AdHoc Reports > Assessment >§303d/§305b > All Causes with Sources

8.0 Quality Assurance / Quality Control Activities

The public participation process for both TMDLs and the IR provides opportunities for review and comment by other SWQB staff familiar with the watershed; and stakeholders, including entities and individuals living and working in particular watersheds who provide specific information regarding probable sources of impairment that may have not been identified by SWQB. While all submitted Probable Sources are considered, weight is given to input from local stakeholders and field staff familiar with the AU. Ultimately, the assignment of Probable Sources is up to the discretion of the TMDL Lead and the TMDL and Assessment Supervisor.

The SWQB controls the quality for developing a qualitative list of probable sources of impairment for Total Maximum Daily Loads (TMDLs), TMDL Alternatives (ALTs), and other planning documents by using the standardized processes documented in this SOP. All personnel who conduct probable source determination activities for the Bureau must be familiar with these protocols, sign the acknowledgment form associated with this specific SOP and collate data in accordance with the procedures as they are defined in this SOP.

Assurance of data collation for processes of developing a qualitative list of probable sources of impairment for Total Maximum Daily Loads (TMDLs), TMDL Alternatives (ALTs), and other planning documents; are done through adherence to the process outlined in this SOP and oversight of the process by the QAO. If at any time the QAO determines this process is not being adhered to, the QAO has the authority to cease activities specific to this SOP with prior support and approval by the SWQB Bureau Chief and MASS Program Manager, until such a time that the issue can be resolved.

9.0 Related Forms

Appendix A – ATTAINs-Compatible Probable Source List, Descriptions, and GIS-Related Data Sources

10.0 Revision History

Revision 1. March 2013 – The word “probable” was dropped from the phrase “probable cause” because there are quantitative procedures (i.e., SWQB’s Assessment Protocols) to determine causes of impairment. All referenced to the Assessment Database (ADB) were changed to the Surface water QUality Information Database (SQUID), which is a result of a database merger. Public Probable Source Survey form was updated to better match the scoring in the staff form.

Revision 2. April 15, 2015 – The “Where Housed” column in Table 1 was updated to reflect the continuing movement towards an electronic Administrative Record. Section 6.2 was revised to clarify SQUID update roles during development of the Integrated List.
Jody Kougioulis, QAO; Lynette Guevara, SME; James Hogan, Acting MASS Program Manager

Revision 3. July 31, 2020– Complete process revision to remove survey staff completion of paper probable sources sheets in the field and replace with use of now-available GIS and imagery tools. Miguel Montoya, QAO; Heidi Henderson, SME; Kristopher Barrios, MASS Program Manager

11.0 References

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