

Jordan River *E. coli* TMDL

MS4 Implementation Guidance

PREPARED BY

Utah Division of Water Quality
General Permitting and Watershed Protection Staff



UTAH DEPARTMENT *of*
ENVIRONMENTAL QUALITY
**WATER
QUALITY**

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Total Maximum Daily Load (TMDL)

Background

A Total Maximum Daily Load (TMDL) analysis was completed by the Utah Division of Water Quality (DWQ) to address *E. coli* exceedances throughout the Jordan River watershed. A TMDL analysis determines the amount of an identified pollutant that a waterbody can receive and still support its beneficial uses and meet state water quality standards. Once the location and magnitude of exceedances, as well as all potential sources, are identified, controls are implemented to reduce pollutant loading until the waterbody is brought back into compliance with water quality standards.

The Utah Division of Water Quality (DWQ) collects water quality data as part of the [Integrated Report](#) process and assesses whether a waterbody is meeting water quality standards for its designated beneficial uses. The 2022 Integrated Report identified 14 assessment units (AUs) in the Jordan River watershed, including portions of the main stem and tributaries, for inclusion in Utah's 2022 303(d) list of impaired waters for not meeting drinking water (1C) and infrequent primary contact recreation (2B) designated beneficial uses due to exceedances of water quality standards for *E. coli* bacteria (Figure 1).

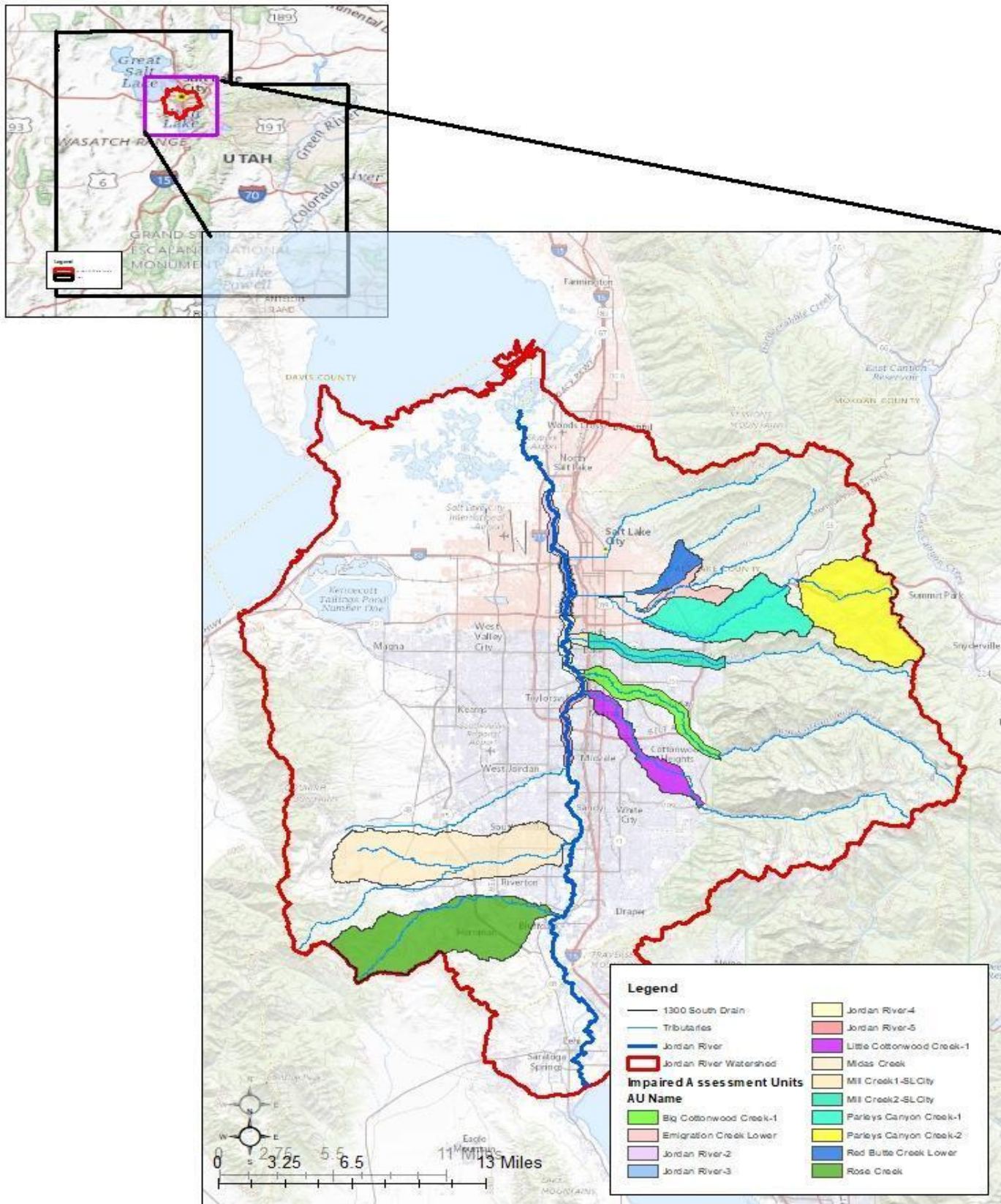


Figure 1: *E. coli* impaired assessment units within the Jordan River watershed

E. coli are the most abundant coliform bacteria present in human and animal intestines, numbering up to one billion organisms per gram of feces. Their presence can be attributed primarily to fecal origin, and their presence in water can be an indication of recent contamination. Some common sources of waterborne pathogens (*E. coli*) include failing septic (onsite wastewater) systems, leaking sewer lines, grazed pastures, confined feedlots, wildlife, and dog parks (Benham, 2006). Pathogenic bacteria are washed into surface waters during rainfall or snowmelt or are deposited directly in the water. These bacteria pose a threat to human health from incidental ingestion.

The potential sources of *E. coli* that may be contributing to the water quality impairments in a watershed are characterized as either point or nonpoint sources. Point sources are spatially discrete and regulated under the Utah Pollution Discharge Elimination System (UPDES) permits. Nonpoint sources are spatially distributed and not regulated. Stormwater discharges can be either nonpoint source or point source, depending on whether they are regulated under a permit program.

There are three main transport pathways for *E. coli* to enter surface waters: **surface water runoff, shallow groundwater leaching, and direct deposition**. Figure 2 shows a schematic of possible contamination routes.

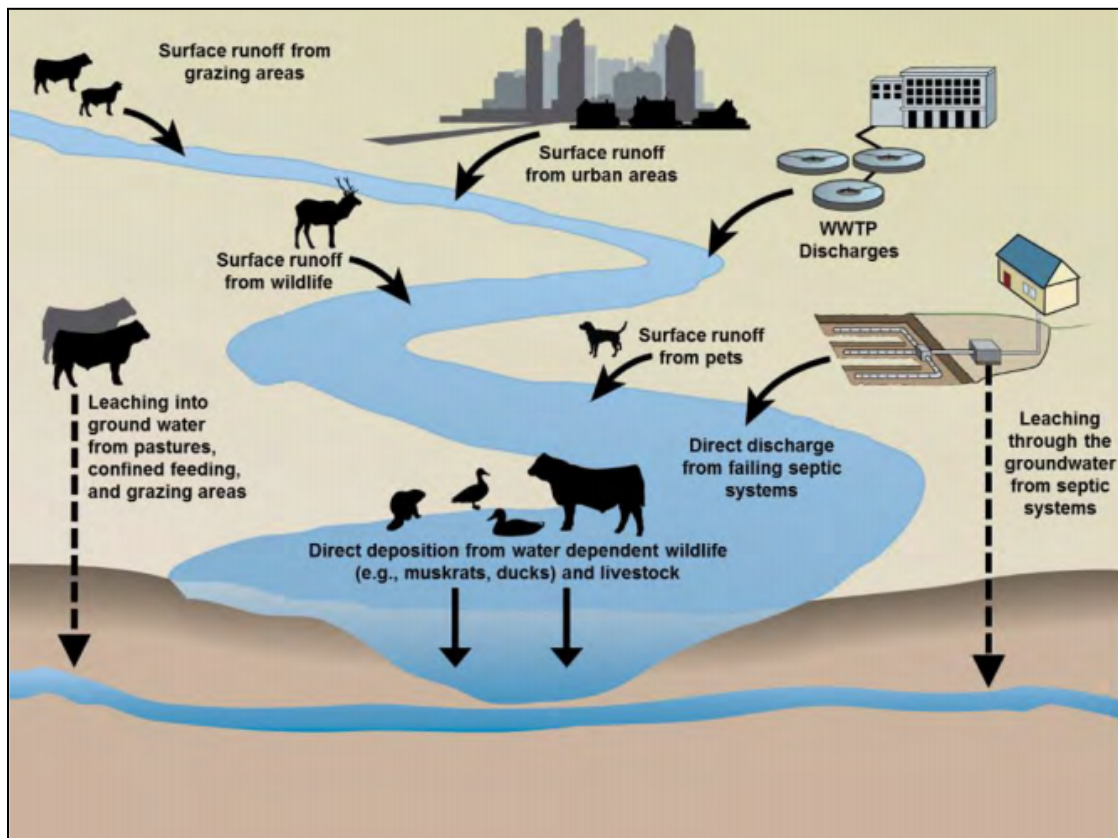


Figure 2: Possible bacteria transport pathways schematic (WY DEQ, 2018)

Jordan River *E. coli* TMDL recommendations and requirements

The Jordan River Watershed-wide *E. coli* TMDL uses a concentration-based approach with allowable levels of bacteria set as a concentration expressed in bacteria counts/100 mL of water. The goal is that all discharges to surface waters (point and nonpoint source) meet the water quality criterion so standards are met throughout the waterbody.

The Utah Division of Water Quality (DWQ) believes this approach has several benefits for the impaired assessment units (AUs) in the Jordan River watershed. A concentration limit is easier for stakeholders to understand and implement compared to a load-based limit. This approach is also equitable for all UPDES permittees within the impaired AUs, as all are held to the same limit and permit requirements related to best management practice (BMP) implementation regardless of area of responsibility.

The TMDL includes an implementation plan that serves as a guide for implementing water quality improvement projects. There is a nonpoint source strategy that targets *E. coli* loading from onsite septic systems, wildlife, pets, agricultural practices,

recreationists and the unhoused population. The details of that can be found beginning on Page 54 of the [TMDL](#).

Data and source analysis using multiple lines of evidence indicate that stormwater discharges are a significant contributor to the water quality impairment addressed in the Jordan River *E. coli* TMDL. As impervious surfaces increase in the urban setting, stormwater infiltration decreases and pollutant-laden stormwater often flows directly into waterbodies. EPA guidance on NPDES-regulated stormwater discharges recommends implementation of a BMP-based approach within the MS4 individual and general permit requirements as a way to demonstrate compliance with a TMDL. The permit requirements must be clear, specific and measurable (e.g., schedule for BMP implementation, frequency of practice, etc.) and support the minimum control measures identified in the permits (EPA, 2014). The following section is a summary of MS4 permit requirements resulting from this *E. coli* TMDL.

MS4 Permit Requirements

There are currently three Phase 1 MS4s in the Jordan River watershed, including [Salt Lake City](#), and the [Utah Department of Transportation](#) (UDOT) covered under individual permits, Salt Lake County covered under the [Jordan Valley Municipalities Permit](#), and 27 Phase 2 MS4s covered under two general permits (Figure 3). The [General Permit for Discharges from Small MS4s](#) covers the University of Utah and the Veterans Affairs Medical Center. The [Jordan Valley Municipalities Permit](#) covers:

- Salt Lake County
- Bluffdale City
- Cottonwood Heights
- Herriman City
- Holladay City
- Midvale City
- Millcreek
- Municipal Service District:
Emigration
- Murray City
- Riverton City
- Sandy City
- South Jordan City
- South Salt Lake City
- Taylorsville City
- West Jordan City
- West Valley City

These 4 MS4s permits were updated to include Jordan River *E.coli* TMDL requirements on August 16, 2023. Permittees covered under MS4 permits are expected to incorporate TMDL requirements, at a minimum, into the six minimum control measures, which include:

- Public education and outreach on stormwater impacts
- Public involvement and participation
- Illicit discharge detection and elimination (IDDE)
- Long-term stormwater management in new development and redevelopment (post-construction stormwater management)
- Construction site stormwater runoff control
- Pollution prevention and good housekeeping for municipal operations

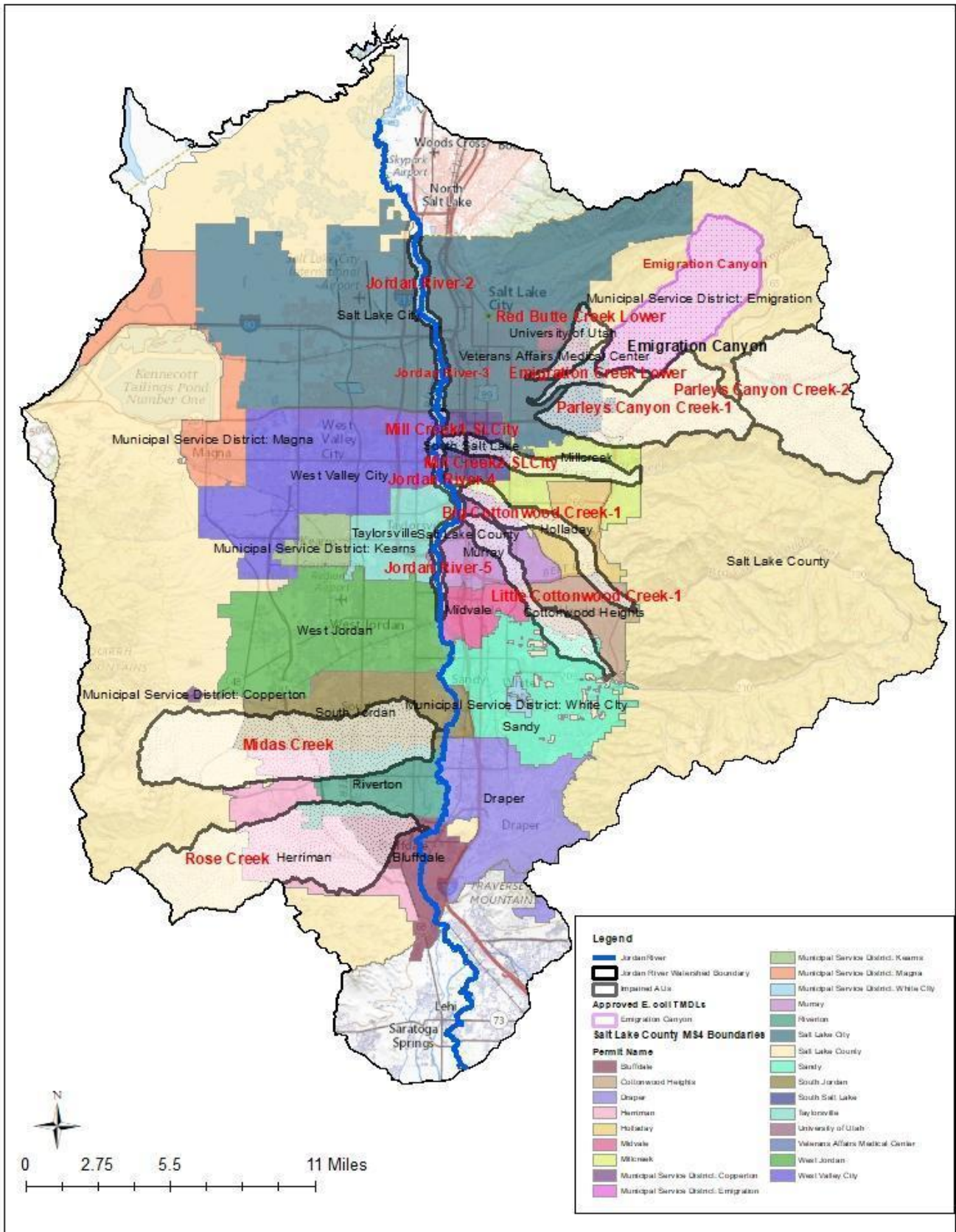


Figure 3: Permitted MS4s in the Jordan River Watershed

TMDL Compliance Plan

MS4 permittees that discharge to *E. coli* impaired waters for which storm water is a contributing source per the [Jordan River Watershed Wide *E. coli* TMDL](#), must update their SWMP document within **180 days** (from August 2023) to include a written plan (**TMDL Compliance Plan**) addressing the pollutant reduction requirements of the TMDL as it relates to MS4s.

The **TMDL Compliance Plan** will supplement and build-on the six (6) minimum control measures. The Permittee must develop, fund, and implement BMPs that reduce the discharge of *E. coli*.

The **TMDL Compliance Plan** must be included in the MS4's Storm Water Management (SWMP) document. It can house all the required information directly, or provide references to existing sections of the SWMP where these requirements have been met.

I. Public Education and Outreach

MS4 Permit Part 3.2.2.1.:

Identify potential sources of *E. coli* in the MS4 and **target** specific audiences that may be contributing to the *E. coli* sources. **Provide and document** education and outreach given to the target audiences on the impacts to water quality associated with these types of discharges and BMPs that can be implemented to reduce the discharge of *E. coli*.

MS4 Permit Part 3.2.2.1.1.:

The Permittee can meet the requirements of permit part 3.2.2.1. through contribution to a **collaborative program** (e.g., storm water coalition) that **evaluates, identifies, and targets sources, as well as, provides outreach that addresses *E. coli***.

Implementation Guidance:

Identifying Sources	<p><i>E. coli</i> sources include both point source & non-point source.</p> <table border="1" data-bbox="391 352 1520 997"> <thead> <tr> <th data-bbox="391 352 878 409"><u>Point source Examples:</u></th> <th data-bbox="878 352 1520 409"><u>Non-point source Examples:</u></th> </tr> </thead> <tbody> <tr> <td data-bbox="391 409 878 997"> <ul style="list-style-type: none"> ● MS4s ● WWTPs ● Industrial Stormwater ● Construction Stormwater </td> <td data-bbox="878 409 1520 997"> <ul style="list-style-type: none"> ● Urban (impervious surfaces, recreationists and unhoused population, storm water outfalls) ● Agriculture (livestock, irrigated pastures, canals with potential to discharge) ● Wildlife (waterfowl, deer, elk, etc.) ● Onsite wastewater systems (failing septic systems) ● Domestic Pets ● <i>E. coli</i> impaired upstream AUs </td> </tr> </tbody> </table>	<u>Point source Examples:</u>	<u>Non-point source Examples:</u>	<ul style="list-style-type: none"> ● MS4s ● WWTPs ● Industrial Stormwater ● Construction Stormwater 	<ul style="list-style-type: none"> ● Urban (impervious surfaces, recreationists and unhoused population, storm water outfalls) ● Agriculture (livestock, irrigated pastures, canals with potential to discharge) ● Wildlife (waterfowl, deer, elk, etc.) ● Onsite wastewater systems (failing septic systems) ● Domestic Pets ● <i>E. coli</i> impaired upstream AUs
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Resources	<p>Spreadsheet which identifies the sources of <i>E. coli</i> within each AU per the TMDL: Jordan River <i>E. coli</i> TMDL Assessment Units and Sources List</p> <p>This spreadsheet can be used in conjunction with Figure 1 of this document.</p>				
Targeting Audiences	<p><u>Based on the sources identified in the MS4</u>, specific audiences must be targeted for education and outreach. Specifically, target audiences must be educated on the impacts to water quality & Best Management Practices (BMPs) to prevent the discharge of <i>E. coli</i>.</p> <p><i>Please note that not all sources will easily correlate to a target audience; however, tracing the source upstream may help identify potential target audiences for the identified sources.</i></p>				
TMDL Compliance Documentation	<ol style="list-style-type: none"> 1. Identified potential source areas of <i>E. coli</i> 2. Targeted audiences (based on source areas) 3. Documentation of education and outreach provided to each targeted audience 				

Resources

- [E. coli Sources, Audiences, & Potential Best Management Practices \(BMPs\) Worksheet](#)
- [Salt Lake County Storm Water Coalition E. Coli Webpage](#)
- [EPA Stormwater Smart Outreach Tools webpage](#)
- [DEQ E. coli Website](#)

II. Inventory of Sources of *E. coli* within the MS4

MS4 Permit Part 3.2.2.2.:

The Permittee must maintain a written or mapped inventory of areas in the MS4 that are potential sources of *E. coli* (i.e., areas with septic systems, dense waterfowl areas, dog parks, etc.).

Implementation Guidance:

Inventory of Sources

DWQ recommends utilizing the following document: [Checklist for *E. coli* Source Inventory](#)¹

The checklist divides sources into categories and includes columns to note whether an inventory has been completed for that source, whether the source has been mapped, whether or not it is a priority for the MS4 permittee, and whether there is a public outreach component specific to that particular source. The template also includes a space to link guidance on BMPs associated with the individual sources.

TMDL Compliance Documentation

1. Develop an inventory of *E. coli* source areas within the MS4 (including areas with septic, dense waterfowl areas, dog parks, etc.)
2. Maintain an inventory of *E. coli* source areas within the MS4.

Resources

- [Jordan River *E. coli* TMDL Assessment Units and Sources List](#)
- [Checklist for *E. coli* Source Inventory](#)

MS4 Permit Part 3.2.2.1.:

The Permittee must create a plan to **prioritize** *E. coli* reduction activities to address the areas and sources identified in the inventory. The plan must include **BMPs the permittee will implement** over the permit term (structural and non-structural).

¹ Bacteria Source Inventory template was adapted by DWQ from the Minnesota Stormwater webpage. DWQ obtained permission to utilize this template.

Implementation Guidance:

Prioritization Plan

Potential Prioritization Considerations:

- Site proximity to Water of the State
- Source of *E. coli*
- Magnitude of *E. coli* loading
- Practical and economic feasibility of implementation of structural and/or non-structural controls
- Location specific factors
- Cost

Reduction activities include (but not limited to):

Non-structural

- Increase sweeping at priority areas
- Clean-up of pet & waterfowl areas prior to storm events
- Keep pet waste bags stocked
- Clean out pet waste receptacles regularly (so they don't overflow)
- Educate on regular septic system maintenance
- Partner with programs to work with unhoused populations
- Require regular septic system maintenance
- Regularly educate target audiences
- Riparian set-back (buffer zones) between waters of the state

Structural

- Increase waste containment areas
- Run on diversion (from sources of *E. coli*)
- Identification and repair of illicit cross-connections
- Updates to MS4 infrastructure
- Installation of LID controls with bacterial listed as a medium to high effectiveness
- See Appendix A for more examples

Example Plan/Scenario

MS4 X has 2 parks with dense waterfowl areas, 3 dog parks, and 2 areas predominantly on septic.

For MS4 X, in year 1 of the permit, we will prioritize the following reduction activities:

1. Cleaning-up pet & waterfowl areas prior to each storm event
 - a. Monitor weather to identify potential dates/times of precipitation
2. Keeping pet waste bags stocked
 - a. Check on stock 2/month
3. Clean out pet waste receptacles regularly (so they don't overflow)
 - a. Clean out dog park waste receptacles 1/week
4. Educate on regular septic system maintenance
 - a. Send reminders & info to residents 2/year
5. Partner with programs to work with unhoused populations
 - a. Attend meetings and assist as necessary
6. Increase waste containment areas
 - a. Monitor areas where pet waste fills up containers more quickly
 - b. Monitor areas where pet waste is frequently uncontained
 - i. Install waste containment in areas identified above

TMDL Compliance Documentation

Create a plan which includes:

1. Identification of source areas
2. Identification of reduction activities
3. Identification of new structural and/or non-structural controls implemented including anticipated date/times over the permit term.

Resources

- [Jordan River *E. coli* TMDL Assessment Units and Sources List](#)
- [Checklist for *E. coli* Source Inventory](#)
- [Section 2.2. of Colorado *E. Coli* Toolbox](#)
- [Table 8. Sources and Strategies for Bacteria Reduction of Colorado *E. coli* Toolbox](#)

MS4 Permit Part 3.2.2.2.2.:

The Permittee must add the inventoried areas to the priority areas identified in permit part 4.2.3.3.1. and begin inspecting the additional priority areas annually at a minimum and documenting the inspections on an inspection form.

Other applicable MS4 permit requirements:

- MS4 permit part 4.2.3.3.1. Includes a list of priority areas likely to have an illicit discharge (if applicable to the jurisdiction).
- MS4 permit part 4.2.3.3.2. Requires that the permittee must inspect and document all priority areas (including *E. coli* source areas) annually, at a minimum, and document the inspections on an inspection form.

Please note, this may require altering the MS4's inspection form for E. coli related indicators (see below).

Implementation Guidance:

IDDE Priority Area Inspections	<p>Examples of <i>E. coli</i> related-indicators include (but not limited to):</p> <ul style="list-style-type: none"> • Visible evidence of pet waste upgradient of discharge point? • Visible evidence of waterfowl activity or waste upgradient of discharge point? • Domestic pet waste containers appropriately contained? • Sediment/debris build-up in the gutter or catch basin? • Dry-weather discharge? • Odor, staining, evidence of sanitary waste?
TMDL Compliance Documentation	<ol style="list-style-type: none"> 1. Add <i>E. coli</i> source areas to the IDDE priority areas in permit part 4.2.3.3.1. 2. Update IDDE inspection form (if needed) 3. Inspect all priority areas annually, at a minimum. 4. Document all corrective actions taken from annual inspection.
Resources	<ul style="list-style-type: none"> • Section 2.3.3. of the Colorado E. coli Toolbox

MS4 Permit Part 3.2.2.2.3.:

The Permittee must add the inventoried areas to the priority areas identified in permit part 4.2.6.6.2. for street sweeping and storm sewer system maintenance and begin maintaining the areas at the same frequency. The Permittee's road and parking lot sweeping and storm drain system maintenance SOPs should identify all priority areas (including *E. coli* sources) and must include a schedule that includes priority area frequency.

Other applicable MS4 Permit requirements:

- MS4 Permit Part 4.2.6.6.2. requires that the highest priority areas be maintained at the greatest frequency.

Implementation Guidance:

Frequency of Sweeping & Storm Drain System Maintenance	<p>Update SOPs for road/parking lot sweeping and storm drain system maintenance to include potential <i>E. coli</i> source inventoried areas as priority areas. These SOPs must include a schedule of maintenance.</p> <p>The highest priority areas must be maintained at the greatest frequency.</p>
TMDL Compliance Documentation	<ol style="list-style-type: none">1. Updated sweeping & storm drain maintenance SOPs with frequency of maintenance for <i>E. coli</i> source areas.2. Tracking/documentation of the sweeping and storm drain system maintenance (including priority areas).
Resources	<ul style="list-style-type: none">• EPA BMP Parking Lot and Street Sweeping• EPA BMP Storm Drain System Cleaning

III. MS4 Owned/Operated Facilities & Operations

MS4 Permit Part 3.2.2.3.:

The Permittee must evaluate their written inventory of potential “high priority” permittee owned and/or operated facilities (Permit Part 4.2.6.1.) and identify sites that have potential sources of *E. coli*.

Permittees must add to their inventory any Permittee owned or operated dog parks, parks with open water, sites with septic, or properties that are known potential sources of *E. coli*.

Sites that have been identified as potential sources of *E. coli* must have BMPs (structural or non-structural) that reduce the potential of the discharge of *E. coli*.

Other applicable requirements:

- MS4 Permit Part 4.2.6.1. cites, “The Permittee shall develop and keep current a written inventory of all the below potential “high priority” facilities that are owned or operated by the Permittee and all the associated storm water controls, at a minimum.”

Implementation Guidance:

Evaluation of MS4 Owned /Operated Facilities

The permittee must identify any sites of the inventory required in permit part 4.2.6.1. that have potential sources of *E. coli*.

The permittee must add (1) MS4 owned/operated dog parks, (2) MS4 owned/operated parks with open water, (3) MS4 owned/operated sites with septic, and (4) MS4 owned/operated properties that are known potential sources of *E. coli* to the list of potential “high priority” facilities identified in permit part 4.2.6.1.

	Any additional required <i>E. coli</i> BMPs would need to be maintained in the inventory of associated storm water controls per permit part 4.2.6.1.
TMDL Compliance Documentation	<ol style="list-style-type: none"> 1. Updated list of MS4 Owned/Operated facilities evaluated for high-priority. 2. Updated process for evaluation of high-priority facilities including potential <i>E. coli</i> contamination as a parameter. 3. Implementation of any new structural or non-structural BMPs to reduce the potential of the discharge of <i>E. coli</i> at sites to be evaluated for high priority. 4. Updated storm water control list to include any new structural or non-structural BMPs to reduce the potential of the discharge of <i>E. coli</i> at sites to be evaluated for high priority. 5. Update SWMP with a plan for implementation of storm water controls, including dates and measurable goals.
Resources	<ul style="list-style-type: none"> • Jordan River <i>E. coli</i> TMDL Assessment Units and Sources List • MS4 High Priority Facility SWPPP Template

MS4 Permit Part 3.2.2.4.:

Permittees must evaluate the potential *E. coli* generating activities below to determine whether existing SOPs should target reduction of *E. coli* discharge or if additional SOPs should be developed for the reduction of *E. coli* discharge from the MS4:

- Roads, highways, and parking lots: Surface cleaning and controlling litter
- Parks and open space: Lake and lagoon maintenance
- Parks and open space: Mowing/Trimming/Planting
- Storm water collection and conveyance system: Inspection and Cleaning of Stormwater Conveyance Structures, Controlling Illicit Connections and Discharges, Controlling Illegal Dumping
- Material storage areas: Solid Waste Collection, Controlling Litter, Controlling Illegal Dumping
- Storm water collection and conveyance system: Water line Maintenance, Sanitary Sewer Maintenance, Spill/Leak/Overflow Control, Response, and Containment.

Implementation Guidance:

Evaluation of Existing SOPs to Target Reduction of *E. coli* Discharge

Potential *E. coli* generating activities below:

Roads, highways, and parking lots: Surface cleaning and controlling litter

- Things to consider: Schedule of maintenance (required per permit part 3.2.2.2.3.), target sweeping in during recreation season (May-October), target surface cleaning before/after storms, target visible *E. coli* source areas

Parks and open space: Lake and lagoon maintenance

- Things to consider: Schedule of maintenance, prioritize areas where waterfowl congregate, schedule of maintenance (especially prior to a storm event), target surface cleaning before/after storms, prioritize areas with visible *E. coli* sources, etc.

Parks and open space: Mowing/Trimming/Planting

- Things to consider: Schedule of maintenance, removal of *E. coli* sources prior to mowing/trimming/planting, etc.

Storm water collection and conveyance system: Inspection and Cleaning of Stormwater Conveyance Structures, Controlling Illicit Connections and Discharges, Controlling Illegal Dumping

- Things to consider: Schedule of maintenance (required per permit part 3.2.2.2.3.), increase inspection of priority areas likely to have an illicit discharge (required per permit part 3.2.2.2.2.), target *E. coli* source areas, target maintenance before/after storms

Material storage areas: Solid Waste Collection, Controlling Litter, Controlling Illegal Dumping

- Things to consider: Schedule of inspections of storage areas to ensure adequate containment (to avoid leaking or broken waste containment), schedule of emptying of waste

	<p>collection areas (to avoid overflow or uncontained waste), etc.</p> <p>Storm water collection and conveyance system: Water line Maintenance, Sanitary Sewer Maintenance, Spill/Leak/Overflow Control, Response, and Containment.</p> <ul style="list-style-type: none"> • <u>Things to consider:</u> Spill/Leak/Overflow Control, downgradient structural BMPs for containment and/or treatment, etc.
<p>TMDL Compliance Documentation</p>	<ol style="list-style-type: none"> 1. Updates of existing SOPs 2. Creation of new SOPs
<p>Resources</p>	<ul style="list-style-type: none"> • Overview, water quality benefits, and other co-benefits of street sweeping • Minnesota Pollution Control Agency: Pollution Prevention and the MS4 Program: Street & Parking Lot Sweeping

IV. LID Controls that Target *E. coli*

MS4 Permit Part 3.2.2.5.:

Permittees must promote the use of Low Impact Development (LID) controls for which *E. coli* (listed as bacteria) has a **medium or high pollutant removal effectiveness**, as identified in the [Guide to Low Impact Development within Utah](#), Appendix C on the division's website:

Other applicable MS4 Permit requirements:

- Permit Part 4.2.5.1.3. requires that permittees must allow for use of a minimum of five LID practices from the list in Appendix C of the Guide.

Implementation Guidance:

Promotion of LID Controls that Target *E. coli*

Per permit part 4.2.5.1.3. ensure these 5 LID practices (at a minimum) include bacteria as having a medium or high pollutant removal effectiveness.

LID practices with medium or high pollutant removal effectiveness for bacteria are listed in [Appendix A](#)

TMDL Compliance Documentation

1. Updated LID promotion guidelines
2. Updated 5 LID approved practices (if applicable)

Resources

- [Guide to Low Impact Development within Utah](#)
- [Appendix A](#) of Jordan River *E. coli* TMDL MS4 Guidance Document

V. Incorporation of *E. coli* criterion in Retrofit Ranking Plan

MS4 Permit Part 3.2.2.6.:

Permittees must add potential *E. coli* reduction as a criterion for ranking when evaluating sites contained within the Permittees retrofit plan.

Other applicable MS4 Permit requirements:

- MS4 Permit part 4.2.6.9. “The Permittee must develop a plan to retrofit existing developed sites that the Permittee owns or operates that are adversely impacting water quality. The retrofit plan must be developed to emphasize controls that infiltrate, evapotranspire, or harvest and use storm water discharges.”

Implementation Guidance:

Incorporation of *E. coli* criterion in Retrofit Ranking Plan

Per permit part 4.2.6.9., the plan must include a ranking of retrofit sites based on the following criteria:

- Proximity to waterbody;
- Current assessment of waterbody with the goal to improve impaired waterbodies and protect unimpaired waterbodies;
 - Including any sites identified from the Jordan River *E. coli* TMDL*
- Hydrologic condition of the receiving waterbody;
- Proximity to sensitive ecosystem or protected area; and
- Any sites that could be further enhanced by retrofitting storm water controls.
 - For example: any additional sites that could benefit from *E. coli* reduction*

TMDL Compliance Documentation

- Updated retrofit plan ranking to include sites that would benefit from *E. coli* reduction

Resources

- [Guide to Low Impact Development within Utah](#)
- [Appendix A](#) of Jordan River *E. coli* TMDL MS4 Guidance Document

VI. Incorporation of *E. coli* monitoring at Wet-Weather Sites (Phase 1 Permittees Only)

MS4 Permit Part 3.2.2.7.:

The Permittee is required to monitor and analyze *E. coli* (No./100 mL) at their Wet Weather Monitoring sites that discharge to the Jordan River and its tributaries in Permit Part 5.2.2.4.

Other Relevant information:

- MS4s are delineated as either Phase 1 or Phase 2, where Phase 1 permits are for medium and large municipalities serving over 100,000 people. Phase 1 permittees are required to develop a wet-weather monitoring program that includes a sampling plan that commits to a minimum sampling frequency of twice per year (fall and spring).

Implementation Guidance:

Incorporation of *E. coli* monitoring at Wet-Weather Sites

***E. coli* Sampling Locations & Sample Type:**

- E. coli* sampling is only required for outfall locations that discharge to the Jordan River and its tributaries.
- E. coli* sampling must be conducted for the flow weighted composite sample of the entire event or, at a minimum, the first three hours of discharge

***E. coli* Sampling Conditions & Considerations:**

Per Permit Part 5.2.2.6.:

- Sampling conditions must be collected from the discharge resulting from a storm event that is greater than 0.2 inches of precipitation within a three hour period that occurs at least 72 hours from the previously measurable (greater than 0.1 inch rainfall) storm event.
- Composite samples may be taken with a continuous sampler or as a combination of a minimum of three sample aliquots

	<p>taken in each hour of discharge for the entire discharge or for the first three hours of the discharge, with each aliquot being separated by a minimum period of fifteen minutes.</p> <ul style="list-style-type: none"> ● If an <i>E. coli</i> sample cannot be analyzed because of holding time constraints, this must be noted on the sampling summary sheet for that event. ● Analysis and collection of samples shall be done in accordance with the methods specified at 40 CFR Part 136. Where an approved Part 136 method does not exist, any available method may be used.
<p>TMDL Compliance Documentation</p>	<ol style="list-style-type: none"> 1. Updates to the permittees Wet-Weather Monitoring Plan to include <i>E. coli</i> as a parameter for sites that discharge to the Jordan River and its tributaries. 2. Fall & Spring <i>E. coli</i> sample results for wet-weather sites that discharge to the Jordan River and its tributaries
<p>Resources</p>	<ul style="list-style-type: none"> ● Collection, Handling, and Quantification of Total Coliform and Escherichia Coli (E.coli) Samples ● Stormwater Monitoring Using Portable Samplers

Submissions & Reporting

TMDL Compliance Plan & SWMP Update Deadline

Permittees that discharge to waters listed on the Utah 303(d) list as impaired for *E. coli* for which storm water is a contributing source per the Jordan River Watershed Wide *E. coli* TMDL must update their SWMP document **within 180 days** to include a written plan (TMDL Compliance Plan) addressing the pollutant reduction requirements of the TMDL as it relates to MS4s.

180 days from the permit effective date is **February 12, 2024**. MS4s should have their SWMP updated to include the TMDL Compliance Plan by that date.

Annual Report and TMDL Compliance Report Form

MS4s will be required to report annually on their TMDL compliance by submitting a TMDL compliance report form with their annual report. The reporting will include identification of problem areas for which source control BMPs were developed, the cost, and the anticipated pollutant reduction. The first TMDL Compliance Report within the annual report will be due to the Division by **October 1, 2024**.

Form templates can be found at DWQ's MS4 Website:

<https://deq.utah.gov/water-quality/municipal-separate-storm-sewer-system-ms4s-permits-updes-permits>

A copy of the TMDL Compliance Report Form is available here:

<https://documents.deq.utah.gov/water-quality/stormwater/DWQ-2023-126645.pdf>

Please contact DWQ Stormwater Section Staff if you need assistance with completion of these forms.

Appendix A

Structural BMPs for Stormwater Source Control

BMP	Description	Location within Guide to Low-impact Development in Utah
Rain garden	Rain gardens are shallow bioretention areas with engineered or native soils that allow for infiltration and removal of pollutants.	Appendix C-3
Bioretention cell	Bioretention cells are shallow bioretention areas with engineered soil. They typically differ from rain gardens by having a delineation such as a curb, wall, or other distinct boundary.	Appendix C-10
Bioswale	Bioswales are vegetated open channels designed to convey and treat stormwater runoff. They are appropriate when it is desirable to convey flows away from structures or as an alternate conveyance method to pipes, concrete channels, or curbed gutters.	Appendix C-16
Vegetated strip	Vegetated strips are designed to receive and treat sheet flow from adjacent surfaces. This is accomplished by slowing runoff velocity to allow pollutants and sediments to settle and filtering out pollutants in the vegetation before entering the storm sewer system. Vegetated strips are best utilized for stormwater treatment from roads,	Appendix C-23

	parking lots, and other impervious surfaces.	
Tree box filter	Tree box filters are bioretention systems that consist of an underground concrete vault that contains a soil matrix that provides bioretention and has a grated top where vegetation grows.	Appendix C-28
Green roof	A green roof is a vegetated system that is designed to retain and treat rooftop runoff. The primary function of a green roof is bioretention, volume retention, and filtration. Green roofs capture stormwater within the pore space of the soil and vegetation, and the moisture is then released through evapotranspiration.	Appendix C-31
Pervious surfaces	Pervious surfaces such as permeable pavement, concrete pavers, pervious concrete, modular open pavers, and other types of pervious surfaces provide structural support for light vehicle or pedestrian traffic while also providing open space for stormwater infiltration.	Appendix C-36
Infiltration basin	Infiltration basins are shallow depressions that use existing soils to retain and provide treatment for stormwater runoff. Infiltration basins function by capturing and infiltrating runoff over a specified drawdown time.	Appendix C-41

Infiltration trench	Infiltration trenches are linear excavations that are backfilled with a combination of gravel, open graded stone, and sand layers that provide storage within the pore space of the specified layers.	Appendix C-47
Dry well	Dry wells are underground storage areas that retain water and infiltrate runoff into the existing soils surrounding the well.	Appendix C-53
Underground infiltration galleries	Underground storage devices are proprietary alternatives to above-ground storage when space at the project site is limited. Pretreatment of water entering the underground system may be required.	Appendix C-58
Harvest and reuse	Harvest and reuse refer to any type of runoff collection system that captures rainfall, stores it temporarily, and reuses it for irrigation, landscaping, or other non-potable uses.	Appendix C-62

References

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US EPA. (2014). Revisions to the November 22, 2002 Memorandum “Establishing Total Maximum Daily Load (TMDL) Wasteload Allocations (WLAs) for Storm Water Sources and NPDES Permit Requirements Based on those WLAs. November 26, 2014.

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