



# LAKE LUCILE

## DRAFT TOTAL MAXIMUM DAILY LOAD

### WATER QUALITY RECOVERY FACTSHEET

ALASKA DEPARTMENT OF ENVIRONMENTAL CONSERVATION  
DIVISION OF WATER

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Improving And Protecting Alaska's Water Quality

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#### 1. What is the problem with Lake Lucile's water quality?

Lake Lucile (also spelled Lucille), located in Wasilla, AK, has too much lead (Pb), zinc (Zn), and a group of hydrocarbons called polycyclic aromatic hydrocarbon (PAH) in the sediments at the bottom of the lake.

Lead, zinc, and PAH are typical stormwater runoff pollutants. Sources include tire, brake, and road surface wear and asphalt particles; vehicle combustion of fossil fuels, including fuel additives, exhaust and leaking fluids such as oil; creosote pilings, docks, or railroad ties; galvanized metal such as fences, culverts and guard rails.

#### 2. How does the pollution get to Lake Lucile?

The majority of the metals and PAH pollutant loading to the lake comes as stormwater runoff from the urban land areas that drain to Lake Lucile through the piped stormwater system (Figure 1). There are two stormwater discharge pipes ("east" and "west") that empty into Lake Lucile (Figure 2). The impaired area of the lake is approximately 4.5 acres in the northeast area surrounding the east outfall and 1.1 acres in the northwest area surrounding the west outfall.

Stormwater runoff is generated from rain and snowmelt events that flow over land or impervious surfaces, such as paved streets/highways, parking lots, and building rooftops, and does not soak into the ground. The runoff picks up pollutants like trash, chemicals, metals (copper, lead, zinc, and cadmium), oils and hydrocarbons (PAH), and dirt/sediment. These pollutants often end up in local waterways.



**Figure 1. East stormwater outfall  
Lake Lucile**

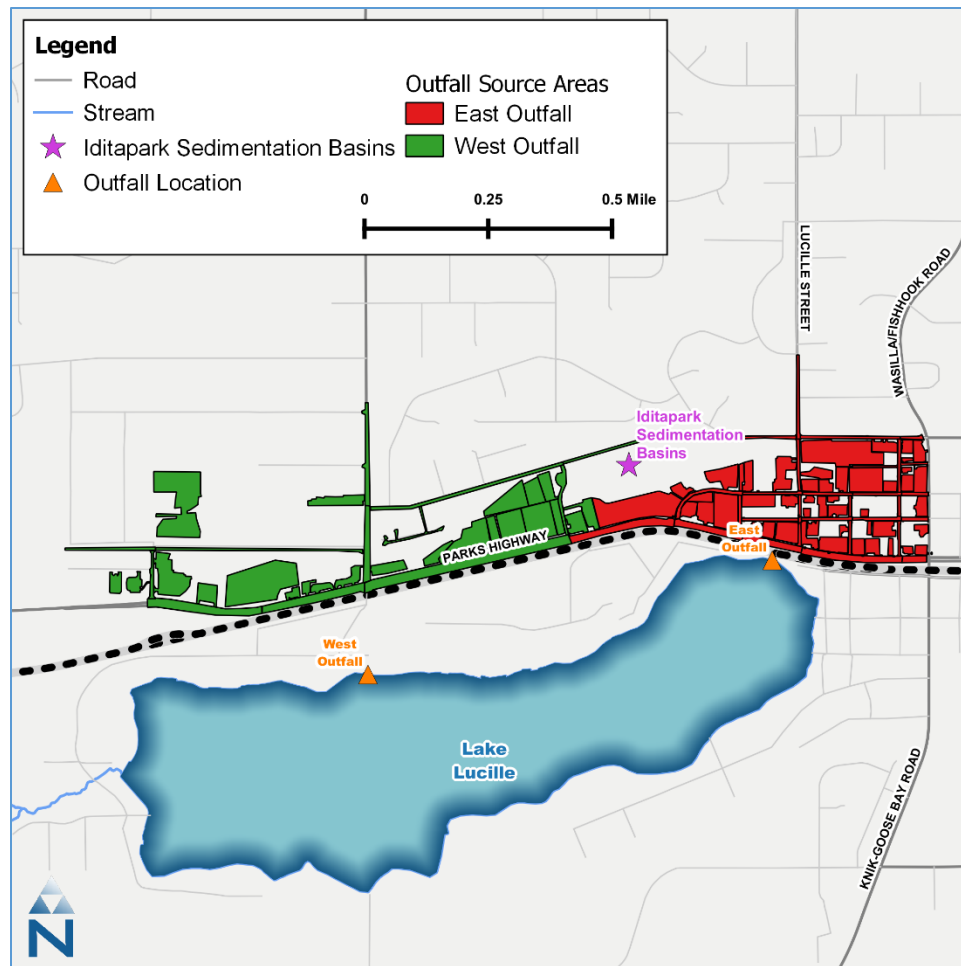


Figure 2. Approximate land areas draining to the east and west Lake Lucile outfalls, Wasilla

### 3. Is it safe to recreate in Lake Lucile?

Yes, it is safe to continue fishing and swimming in Lake Lucile. Lake Lucile's Pb, Zn, and PAH pollution is located in the lakebed sediments near the two stormwater discharge pipes. The pollution levels monitored may cause harm to aquatic life that interacts with the polluted sediment. The Department of Environmental Conservation (DEC) recommends not stirring up the polluted lake bed sediments near either outfall discharge point and extending into the lake approximately 500 feet (west outfall) and 1,000 feet (east outfall).

### 4. What is a Total Maximum Daily Load (TMDL)?

The Clean Water Act (Section 303(d)(1)(C)) requires TMDLs to be developed for impaired (polluted) waterbodies. A TMDL is a pollution budget. It sets the maximum amount of a pollutant (or pollutants) that may be discharged into an impaired waterbody while still meeting the state's allowed limits. The TMDL sets limits for both point and nonpoint sources. The Lake Lucile TMDL covers multiple pollutants (Pb, Zn, and PAH) and includes budgets for each one (Table 1).



The TMDL pollution budget was developed using standard mathematical equations, actual lake sediment sample data, and other landscape and weather measurements. The calculations show the pollutant reductions needed to allow the lake to meet the state's allowed limits for lead, zinc, and polycyclic aromatic hydrocarbon. The approach to developing the TMDL pollutant budget links the metals and PAH concentrations in the lakebed to the sediment loads transported via stormwater runoff. The draft TMDL explains these calculations in detail.

**Table 1. TMDLs for Lead (Pb), Zinc (Zn), and Polycyclic Aromatic Hydrocarbon (PAH)**

Pollutant	g/year						East Outfall Reduction Required, %	West Outfall Reduction Required, %	Margin of Safety	Percent, %
	Existing Load	Load Capacity	WLA <sub>CGP</sub>	LA <sub>NB</sub>	LA <sub>E</sub>	LA <sub>W</sub>				Total Reduction
Lead	713.2	279.9	13.3	37.6	137.4	91.6	71	0	Implicit	61
Zinc	16,520	1,120.0	53.2	191.2	461.4	414.2	96	73	Implicit	93
PAH	13.8	2.4	0.1	0.0	1.2	1.1	86	77	Implicit	83

g = gram; WLA<sub>CGP</sub> = Waste Load Allocation for the Construction General Permit, LA<sub>NB</sub> = Load Allocation for natural background, LA<sub>E</sub> = Load Allocation for east outfall, LA<sub>W</sub> = Load Allocation for west outfall

Note that LA<sub>E</sub> and LA<sub>W</sub> would become WLAs if and when the MS4 permit is issued.

## 5. Who is affected by the TMDL?

**Construction General Permittees:** The TMDL includes a pollutant wasteload allocation for permitted discharges under the Construction General Permit. Permittees will need to follow permit requirements to implement erosion and sediment control best management practices to reduce construction site runoff in the drainage area.

**Department of Transportation and Public Facilities (DOT&PF):** Both stormwater outfalls are operated by DOT&PF. It is anticipated that in the near future, stormwater discharges to Lake Lucile will be regulated by an Alaska Pollutant Discharge Elimination System stormwater permit for municipal separate storm sewer systems (MS4). The TMDL includes calculations for that scenario and will not need to be revised when the permit is issued. DEC and the City of Wasilla are already meeting with DOT&PF to identify potential remedial actions that would provide treatment from DOT&PF right-of-way runoff.

**City of Wasilla:** The City cooperates with DOT&PF by operating and maintaining the piped stormwater system and the Iditapark sedimentation basins draining to Lake Lucile. The City currently has a DEC Alaska Clean Water Actions grant to develop a *Lake Lucile Stormwater Management Plan* that will identify specific locations to install bioretention and other stormwater management practices to reduce sediment and pollutants reaching the lake.



## 6. How will the water quality be improved?

The pollution is reaching the lake through stormwater runoff. Water quality will be improved by reducing the amount of pollutants that reach the stormwater system from land-based activities, and providing some type of filtering or treatment of that stormwater prior to reaching the lake.

### ***What are three important “fixes” for improving Lake Lucile?***

- ✓ Implement best management practices to capture and filter pollutants such as installing bioswales, rain gardens, constructed wetlands, and other similar practices.
- ✓ Follow permit guidance for construction sites to prevent erosion and runoff.
- ✓ Provide education on ways everyone can contribute to healthier lake water quality.

## 7. How can I learn more about this draft TMDL recovery plan or make comments?

The draft TMDL is available on the DEC website (<http://dec.alaska.gov/water/water-quality/impaired-waters/>) or by request from the contact below.

DEC is asking for public review and comments at this time. **Written public comments must be mailed, faxed, emailed, or hand delivered to the address below before 5:00 PM on April 28, 2020.**

Answers to commonly asked questions about TMDLs in general can be found on the DEC website at: <http://dec.alaska.gov/water/water-quality/impaired-waters/#impaired-water-tabs>.

Alaska Department of  
Environmental Conservation

Attention: Laura Eldred

1700 E. Bogard Rd., Bldg B,  
Suite 103  
Wasilla, AK 99654

**Email:**

[laura.eldred@alaska.gov](mailto:laura.eldred@alaska.gov)

**Phone:** (907) 376-1855

**FAX:** (907) 376-2382

**Written comments must be received by 5pm April 28, 2020**