



# *Alaska Pesticide Control Program Water Quality And Pesticides Plan*

*This plan describes the steps that the Alaska Department of Environmental Conservation (DEC) Pesticide Control Program (PCP) will take if pesticides are detected in surface or ground water in Alaska.*

## **BACKGROUND**

### **Water Resources in Alaska**

The state of Alaska is huge in size, encompassing over 586,000 square miles, an area roughly equivalent to one-fifth the size of the contiguous 48 states<sup>i</sup>. Alaska has more than 40% of the nation's surface water resources including 365,000 miles of rivers and streams<sup>ii</sup>, three million lakes greater than 5 acres<sup>iii</sup>, and numerous creeks and ponds. Wetland habitats make up 43.3% of the state's surface area<sup>iv</sup>.

Despite its size, human population in Alaska is very low (737,000<sup>v</sup>). The vast majority of the human population (300,000<sup>vi</sup>) is located in Anchorage. As a result, most of Alaska is undeveloped wild lands.

Groundwater is the source of drinking water for about 50% of Alaska's population. Many rely on private wells. Surface water is the source of drinking water for the remaining half of the population. Residents living in arctic, western, and southeastern Alaska frequently rely on surface water. Even some large drinking water systems (e.g. Anchorage) rely on surface water sources.

### **Pesticide Use in Alaska**

Historically, pesticide use in Alaska has been relatively low compared to other states, largely because of the small population and the limited number of pests in this northern climate. The pesticide use that does occur is primarily in urban and agricultural areas.

Urban areas include Anchorage, the Matanuska Valley area, Fairbanks, and Juneau. Other cities and villages have populations of less than 10,000 people, and generally have very limited landscaping, infrastructure, or maintained lands.

The agricultural areas of the state are located in the Matanuska Susitna Borough, Fairbanks, Delta Junction, and Kenai Peninsula. Pest presence in northern climates is limited, and use of pesticides is low compared to many agricultural areas.

There is very little industrial development in Alaska, and industrial use of pesticides is limited. Some biocides are used in oilfield production to prevent or treat for bacteria and algae in drilling fluids.

### **Protective Measures in Alaska**

There are a number of mechanisms in place to ensure that pesticides do not impact water resources in Alaska. The primary protection relies on the Environmental Protection Agency (EPA) review and registration process. Before manufacturers can sell pesticides in the United States, the EPA conducts a thorough evaluation of each pesticide to make sure they can be used without posing harm or “unreasonable adverse effects” to human health or the environment, including potential impacts to water quality. EPA places restrictions or advisory statements on the pesticide label to mitigate impacts.

In addition to federal measures, there are additional rules and restrictions in Alaska, administered by the PCP, that further protect water resources from pesticide impacts. This includes aquatic permits, and registration restrictions.

All applications of pesticides to water in Alaska requires a pesticide use permit<sup>vii</sup>. Typically only two or three permits for aquatic applications are issued per year. Permits are primarily for control of invasive species, including Northern Pike, elodea, and reed canary grass. Permit applications are subject to public comment. Prior to issuing a permit, the PCP conducts a thorough review to ensure no unreasonable adverse effects are expected as a result of the pesticide use. Only products approved for aquatic application are approved. All applications to water must be conducted by a certified applicator (or someone under a certified applicator’s direct supervision).

All pesticides intended solely for aquatic application are designated as Restricted Use Pesticides in Alaska. These products may only be purchased and applied by a certified applicator (or someone under a certified applicator’s direct supervision).

## Pesticides and Water Monitoring

The PCP does not currently conduct any water quality monitoring. Routine water quality monitoring for pesticides by other agencies or programs is almost non-existent in Alaska. The PCP currently relies on data from the DEC Drinking Water Program's water quality monitoring program. The PCP is not aware of any other programs or agencies that are currently monitoring for pesticides in water.

As of August, 2015, the Drinking Water Program provides results from eight sampling points that test for a small selection of pesticides.

### Sampling sites that currently test for pesticides

*(Includes duplicate sites, taken on separate sampling dates).*

Principal County Served	Water System No.	Water System Name	Lab Sample No.	Type	Collection Date & Time	Sampling Point
ANCHORAGE	AK2212039	DOYON UTILITIES JBER - RICHARDSON	PE*3268439	RT	06-23-2015 12:28:00	SPEP003
ANCHORAGE	AK2212039	DOYON UTILITIES JBER - RICHARDSON	PE*3268596	RT	06-23-2015 13:00:00	SPEP004
ANCHORAGE	AK2212039	DOYON UTILITIES JBER - RICHARDSON	PE*3268611	RT	06-23-2015 11:30:00	SPEP001
ANCHORAGE	AK2212039	DOYON UTILITIES JBER - RICHARDSON	PE*3195306	RT	02-24-2015 09:53:00	SPEP003
ANCHORAGE	AK2212039	DOYON UTILITIES JBER - RICHARDSON	PE*3195337	RT	02-24-2015 10:15:00	SPEP004
ANCHORAGE	AK2212039	DOYON UTILITIES JBER - RICHARDSON	PE*3195670	RT	02-24-2015 09:05:00	SPTP001
DILLINGHAM	AK2261460	BINGMAN'S APARTMENTS	PE*3197731	RT	02-26-2015 10:00:00	SPTP001
FAIRBANKS NORTH STAR	AK2310918	FT WAINWRIGHT - MAIN POST	PE*3204739	RT	03-11-2015 11:15:00	SPTP001
MATANUSKA-SUSITNA	AK2220308	NUGENS RANCH (POINT MACKENZIE)	PE*3141050	RT	11-18-2014 08:27:00	SPWL001
MATANUSKA-SUSITNA	AK2220408	VALLEY UTILITIES LLC	PE*3178726	RT	01-27-2015 14:05:00	SPTP001
SOUTHEAST FAIRBANKS	AK2370798	FT. GREELY / DU / ALLEN ARMY AIRFIELD	PE*3245206	RT	05-18-2015 14:00:00	SPTP001
SOUTHEAST FAIRBANKS	AK2370798	FT. GREELY / DU / ALLEN ARMY AIRFIELD	PE*3209455	RT	03-16-2015 13:45:00	SPTP001

Total Number of Records Fetched = 12

The PCP reviews the drinking water data twice a year to determine if pesticides have been detected. Since tracking began in 2009, there have been no detections recorded. This may be because pesticide use is relatively low, but it also may be due to the lack of sampling that would detect pesticides.

The PCP is considering conducting at least some limited sampling of ground or surface water in the future. Any monitoring will be done in accordance with our EPA approved Quality Assurance Project Plan and Quality Management Plan. The PCP will also evaluate any pesticide water quality studies that become available.

## ***RESPONSE TO DETECTIONS***

### **Initial Investigation**

The PCP will investigate all documented pesticide detections in ground or surface water as soon as the Program is aware of the detection.

Upon learning of the detection, the PCP will review available monitoring data for the sampling site and other nearby sites to determine the geographical extent as well as the possible duration of the contamination.

### **Benchmarks**

Monitoring data will be compared to benchmarks or standards to determine the significance of the contamination. Benchmarks have been developed for various pesticides from various sources. The PCP has compiled a number of these standards to develop a more complete list. The list includes only pesticides that are listed as Pesticides of Interest by EPA, or have been commonly found in sampling programs in California or Washington State (two states that have extensive pesticide monitoring programs). These are considered to be the most likely pesticides to be detected. For pesticides not listed, the same sources should be consulted to determine an appropriate standard.

Sources of standards include the EPA's Office of Pesticide Programs aquatic life benchmarks<sup>viii</sup>, EPA's Human Health benchmarks for pesticides<sup>ix</sup>, State of Alaska drinking water standards, and State of Alaska aquatic life standards<sup>x</sup>. For the purpose of determining the significance of the contamination, the most stringent benchmark (often for chronic exposure for aquatic invertebrates) will be used. See Appendix 1.

### **Further Investigation or Action**

In general, if detection levels are less than 50% of the standard, the PCP will continue to evaluate any new monitoring data measured at the site or nearby locations. However, further investigation may not be warranted if concentrations are insignificant and of short duration.

A follow up strategy will be developed based on the extent and severity of contamination, potential risk to human health or the environment, the likely source of contamination, and other relevant data. The PCP may conduct any or all of the following actions if further follow up is determined to be appropriate:

- Additional monitoring may be initiated at the detection site or nearby locations to quantify the extent and severity of contamination, and to track the concentrations over time. The PCP will coordinate with other programs or agencies, or may conduct the sampling itself.
- The detection site and vicinity may be evaluated to determine possible sources of the pesticide contamination. Evaluation will include, as appropriate, current and historical uses of surrounding areas, topography and drainage characteristics, stream or groundwater flow, weather events that could influence pesticide migration, and other factors that may help determine source and extent of the contamination.

- If the PCP determines that the contamination resulted from illegal use, uncontained spills, or illegal disposal of the pesticide, it will pursue enforcement action.
- If the contamination is determined to be from legal use, the PCP will evaluate potential reasons why the pesticide migrated to water, and investigate if additional state mitigation measures or registration restrictions are appropriate. The PCP will also communicate with EPA regarding findings about contamination due to legal use.

### **Coordination With Other Programs**

As appropriate, response strategies will be developed in coordination with other agencies and programs involved in water quality protection. The agencies and programs listed below actively participate in activities that protect water quality in Alaska.

- DEC Drinking Water Program
- DEC Division of Water
- DEC Spill Prevention and Response Division
- Alaska Department of Natural Resources (DNR) – Division of Agriculture
- DNR – Division of Forestry
- Soil and Water Conservation Districts
- EPA Underground Injection Control Program
- EPA Hazardous Waste Program

### **Notifications**

If measured levels of a pesticide in water are 50% or more of a drinking water or human health based standard listed in Appendix 1, the PCP will coordinate with the Drinking Water Program to evaluate the area over which the contamination is likely to travel within a two year time period. The PCP and Drinking Water Program will work together to identify and notify any known drinking water systems, as well as homes or businesses who may have private drinking water sources within that area, that could be affected.

Written notification will include a description of the pesticide detected, the measured concentration in relation to human health standards, and potential health impacts of the detected pesticide.

---

<sup>i</sup> State of Alaska Website: <http://alaska.gov/kids/learn/aboutgeography.htm>

<sup>ii</sup> US EPA Water: [http://water.epa.gov/lawsregs/guidance/cwa/305b/upload/2000\\_06\\_28\\_305b\\_98report\\_appenda.pdf](http://water.epa.gov/lawsregs/guidance/cwa/305b/upload/2000_06_28_305b_98report_appenda.pdf)

<sup>iii</sup> Alaska Department of Fish and Game: <http://www.adfg.alaska.gov/index.cfm?adfg=rivers.main>

<sup>iv</sup> Alaska Department of Fish and Game: <http://www.adfg.alaska.gov/index.cfm?adfg=wetlands.main>

<sup>v</sup> US Census Bureau 2014 estimate: <http://quickfacts.census.gov/qfd/states/02000.html>

---

<sup>vi</sup> US Census Bureau 2014 estimate:

<http://quickfacts.census.gov/qfd/states/02/0203000.html>

<sup>vii</sup> Title 18, Chapter 90, Section 510 of the Alaska Administrative Code (18 AAC 90.505): <http://dec.alaska.gov/commish/regulations/pdfs/18%20AAC%2090.pdf>

<sup>viii</sup> EPA Aquatic Life Benchmarks:

<http://www.epa.gov/oppefed1/ecoriskders/aquaticlifebenchmark.htm>

<sup>ix</sup> EPA's Human Health Benchmarks:

<http://iaspub.epa.gov/apex/pesticides/f?p=HHBP:home>

\* Surface Water Standards for the State of Alaska are listed in the Alaska Water Quality Criteria Manual for Toxic and Other Deleterious Organic and Inorganic Substances (as cited in 18 AAC 70):

<http://dec.alaska.gov/commish/regulations/pdfs/18%20AAC%2070.pdf> and

<http://dec.alaska.gov/water/wqsar/wqs/pdfs/Alaska%20Water%20Quality%20Criteria%20Manual%20for%20Toxic%20and%20Other%20Deleterious%20Organic%20and%20Inorganic%20Substances.pdf>

**Water Quality And Pesticides Plan Appendix 1  
Pesticide Benchmarks for Evaluation of Pesticide Detections in Water**

Selected list of Pesticides	Selection Reason	Lowest Benchmark (ug/L)	Source:	Lowest DW or HH* Standard (ug/L)	Source of DW or HH Standard:
2,4-D	POI, CA	13.1	EPA Aquatic Life Benchmark: Vascular plants, acute	252	EPA Human Health Benchmark: Chronic/Lifetime
Acetochlor	POI	1.43	EPA Aquatic Life Benchmark: Non-vascular plants, acute	140	EPA Human Health Benchmark: Chronic/Lifetime
Alachlor	POI	1.64	EPA Aquatic Life Benchmark: Non-vascular plants, acute	2	Alaska Drinking Water Standards
Aldicarb	POI	0.46	EPA Aquatic Life Benchmark: Fish, chronic		
Atrazine	POI	0.0001	EPA Aquatic Life Benchmark: Vascular plants, acute	3	Alaska Drinking Water Standards
Azinphos-methyl	POI	0.055	EPA Aquatic Life Benchmark: Fish, chronic	11	EPA Human Health Benchmark: Chronic/Lifetime
Bifenthrin (pyrethroid)	CA	0.0013	EPA Aquatic Life Benchmark: Invertebrates, chronic	310	EPA Human Health Benchmark: Chronic/Lifetime
Bromacil	POI	6.8	EPA Aquatic Life Benchmark: Non-vascular plants, acute		
Carbaryl	POI, CA	0.5	EPA Aquatic Life Benchmark: Invertebrates, chronic		
Carbofuran	POI	5.7	EPA Aquatic Life Benchmark: Fish, chronic	40	Alaska Drinking Water Standards
Chlorothalonil (Daconil)	POI	0.6	EPA Aquatic Life Benchmark: Invertebrates, chronic		
Chlorpyrifos	POI, CA, WA	0.04	EPA Aquatic Life Benchmark: Invertebrates, chronic		
Chlorsulfuron	POI	0.35	EPA Aquatic Life Benchmark: Vascular plants, acute	140	EPA Human Health Benchmark: Chronic/Lifetime
Clopyralid	POI	1,050	EPA Human Health Benchmark: Chronic/Lifetime	1,050	EPA Human Health Benchmark: Chronic/Lifetime
Coppers	POI, CA	0.11	EPA Aquatic Life Benchmark: Invertebrates, acute		
Dacthal	POI	1,000	EPA Aquatic Life Benchmark: Plants, acute		

Selected list of Pesticides	Selection Reason	Lowest Benchmark (ug/L)	Source:	Lowest DW or HH* Standard (ug/L)	Source of DW or HH Standard:
DBCP (Dibromochloropropane)	POI	0.2	Alaska Drinking Water Standards	0.2	Alaska Drinking Water Standards
Diazinon	POI, CA, WA	0.11	EPA Aquatic Life Benchmark: Invertebrates, acute		
Dicamba	POI, CA	61	EPA Aquatic Life Benchmark: Non-vascular plants, acute		
Dimethoate	CA	0.5	EPA Aquatic Life Benchmark: Invertebrates, chronic	15	EPA Human Health Benchmark: Chronic/Lifetime
Diuron	POI, CA	2.4	EPA Aquatic Life Benchmark: Non-vascular plants, acute		
Esfenvalerate (pyrethroid)	POI	0.017	EPA Aquatic Life Benchmark: Non-vascular plants, acute	13	EPA Human Health Benchmark: Chronic/Lifetime
Fipronil	CA	0.011	EPA Aquatic Life Benchmark: Invertebrates, chronic	1	EPA Human Health Benchmark: Chronic/Lifetime
Fluroxypyr (phenoxy group)	POI	7,000	EPA Human Health Benchmark: Chronic/Lifetime	7,000	EPA Human Health Benchmark: Chronic/Lifetime
Glyphosate	POI	700	Alaska Drinking Water Standard	700	Alaska Drinking Water Standard
Hexazinone	POI	7	EPA Aquatic Life Benchmark: Non-vascular plants, acute		
Imazamethabenz-Methyl	POI	1,750	EPA Human Health Benchmark: Chronic/Lifetime	1,750	EPA Human Health Benchmark: Chronic/Lifetime
Imazapyr	POI	24	EPA Aquatic Life Benchmark: Vascular plants, acute	17,500	EPA Human Health Benchmark: Chronic/Lifetime
Imidacloprid	POI	1.05	EPA Aquatic Life Benchmark: Invertebrates, chronic	399	EPA Human Health Benchmark: Chronic/Lifetime
Isoxaflutole	POI	4.9	EPA Aquatic Life Benchmark: Vascular plants, acute	140	EPA Human Health Benchmark: Chronic/Lifetime
Lambda-cyhalothrin (pyrethroid)	POI	0.002	EPA Aquatic Life Benchmark: Invertebrates, chronic	7	EPA Human Health Benchmark: Chronic/Lifetime
Lindane	POI	0.05	EPA Aquatic Life Benchmark: Invertebrates, chronic	0.2	Alaska Drinking Water Standard
Malathion	POI, CA, WA	0.035	EPA Aquatic Life Benchmark: Invertebrates, chronic		
MCPA	CA	20	EPA Aquatic Life Benchmark: Vascular plants, acute		

Selected list of Pesticides	Selection Reason	Lowest Benchmark (ug/L)	Source:	Lowest DW or HH* Standard (ug/L)	Source of DW or HH Standard:
Mesotrione	POI	9.8	EPA Aquatic Life Benchmark: Vascular plants, acute	49	EPA Human Health Benchmark: Chronic/Lifetime
Metalaxyl	POI	100	EPA Aquatic Life Benchmark: Invertebrates, chronic		
Methomyl	CA	0.7	EPA Aquatic Life Benchmark: Invertebrates, chronic		
Metolachlor	POI	1	EPA Aquatic Life Benchmark: Invertebrates, chronic		
Metribuzin	POI	8.7	EPA Aquatic Life Benchmark: Non-vascular plants, acute		
Metsulfuron Methyl	POI	0.36	EPA Aquatic Life Benchmark: Non-vascular plants, acute		
MSMA	POI	5,630	EPA Aquatic Life Benchmark: Non-vascular plants, acute		
Napropamide	POI	1,100	EPA Aquatic Life Benchmark: Fish, chronic	840	EPA Human Health Benchmark: Chronic/Lifetime
Nicosulfuron	POI	8,750	EPA Human Health Benchmark: Chronic/Lifetime	8,750	EPA Human Health Benchmark: Chronic/Lifetime
Norflurazon	POI	9.7	EPA Aquatic Life Benchmark: Non-vascular plants, acute	105	EPA Human Health Benchmark: Chronic/Lifetime
Oxyfluorfen	CA	0.29	EPA Aquatic Life Benchmark: Non-vascular plants, acute	210	EPA Human Health Benchmark: Chronic/Lifetime
Pendimethalin	POI	5.2	EPA Aquatic Life Benchmark: Non-vascular plants, acute	210	EPA Human Health Benchmark: Chronic/Lifetime
Permethrin (pyrethroid)	CA, WA	0.0014	EPA Aquatic Life Benchmark: Invertebrates, chronic	1,750	EPA Human Health Benchmark: Chronic/Lifetime
Picloram	POI	500	Alaska Drinking Water Standard	500	Alaska Drinking Water Standard
Prometon	POI, CA	98	EPA Aquatic Life Benchmark: Non-vascular plants, acute		
Prometryn	POI	1.04	EPA Aquatic Life Benchmark: Non-vascular plants, acute	280	EPA Human Health Benchmark: Chronic/Lifetime
Propiconazole	POI	21	EPA Aquatic Life Benchmark: Non-vascular plants, acute	700	EPA Human Health Benchmark: Chronic/Lifetime
Rimsulfuron	POI	11.6	EPA Aquatic Life Benchmark: Non-vascular plants, acute	826	EPA Human Health Benchmark: Chronic/Lifetime

Selected list of Pesticides	Selection Reason	Lowest Benchmark (ug/L)	Source:	Lowest DW or HH* Standard (ug/L)	Source of DW or HH Standard:
Simazine	POI	2.24	EPA Aquatic Life Benchmark: Non-vascular plants, acute	4	Alaska Drinking Water Standard
Sulfosulfuron	POI	1	EPA Aquatic Life Benchmark: Non-vascular plants, acute	1,680	EPA Human Health Benchmark: Chronic/Lifetime
Tebuthiuron	POI	50	EPA Aquatic Life Benchmark: Non-vascular plants, acute		
Terbacil	POI	11	EPA Aquatic Life Benchmark: Non-vascular plants, acute		
Thiamethoxam	POI	17.5	EPA Aquatic Life Benchmark: Invertebrates, acute	84	EPA Human Health Benchmark: Chronic/Lifetime
Thifensulfuron-Methyl	POI	301	EPA Human Health Benchmark: Chronic/Lifetime	301	EPA Human Health Benchmark: Chronic/Lifetime
Tralkoxydim	POI	35	EPA Human Health Benchmark: Chronic/Lifetime	35	EPA Human Health Benchmark: Chronic/Lifetime
Triallate	POI	13	EPA Aquatic Life Benchmark: Invertebrates, chronic	175	EPA Human Health Benchmark: Chronic/Lifetime
Tribenuron-Methyl	POI	2	EPA Aquatic Life Benchmark: Vascular plants, acute	56	EPA Human Health Benchmark: Chronic/Lifetime
Triclopyr	POI, CA	350	EPA Human Health Benchmark: Chronic/Lifetime	350	EPA Human Health Benchmark: Chronic/Lifetime
Trifluralin	POI	1.14	EPA Aquatic Life Benchmark: Fish, acute		
Triflusulfuron-Methyl	POI	168	EPA Human Health Benchmark: Chronic/Lifetime	168	EPA Human Health Benchmark: Chronic/Lifetime

\* Lowest Drinking Water or Human Health Standard.