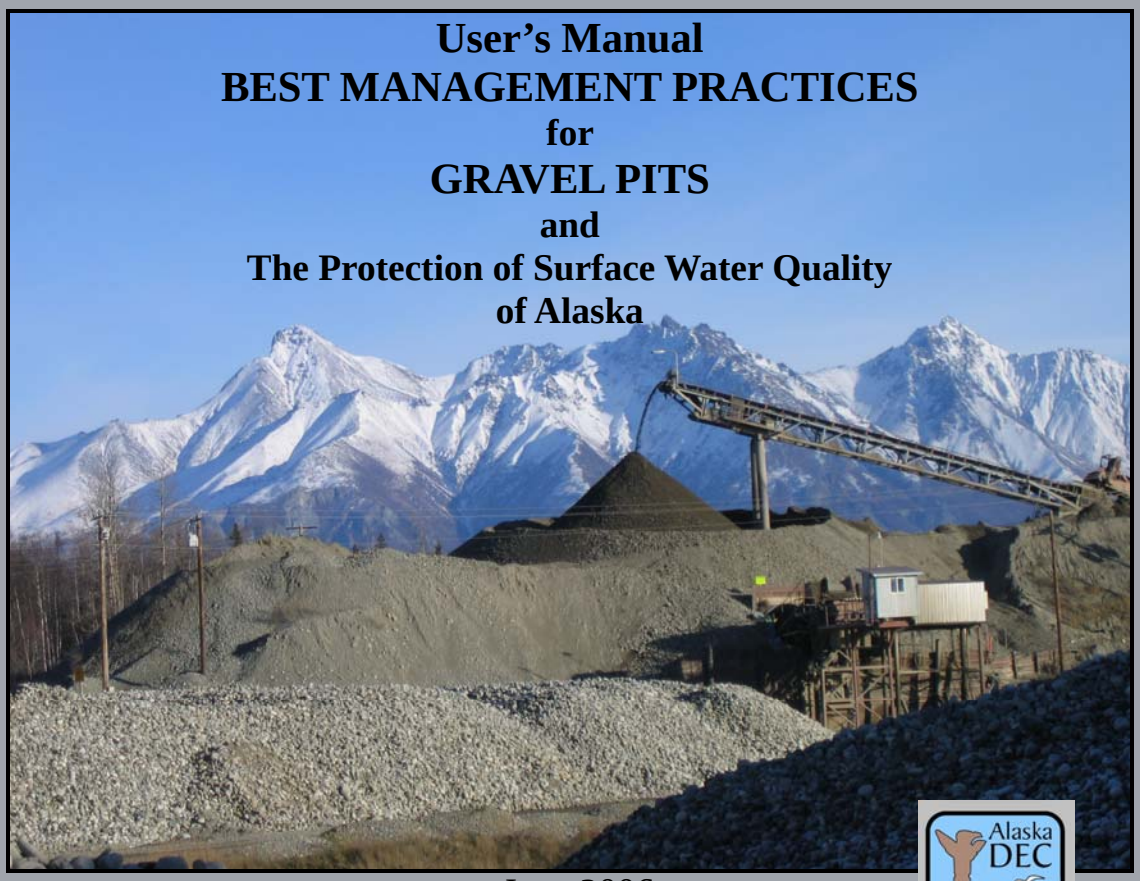
User's Manual
BEST MANAGEMENT PRACTICES
for
GRAVEL PITS
and
The Protection of Surface Water Quality
of Alaska



June 2006

Developed by:
Ecology & Environment, Inc.
840 K Street
Anchorage, Alaska 99501

Developed for:
State of Alaska
Department of Environmental Conservation
Division of Water
555 Cordova Street
Anchorage, Alaska 99501

ACKNOWLEDGEMENT

The *User's Manual to Best Management Practices for Gravel Pits for the Protection of Surface Water Quality in Alaska* is the result of the collective efforts and contributions of a number of individuals. The Alaska Department of Environmental Conservation would like to thank all those that contributed to the development of this document. Special thanks go to the following people and organizations:

Tadd Owens and the Resource Development Council for Alaska, Inc.

Steve Lovs, Jim Rogers and Alaska Sand and Gravel Company, Inc.

Rob Brown, Chuck Wilkes and Central Paving Products

Robert Ruffner, Stephanie Sims, and the Kenai Watershed Forum

Bob Millard and the City and Borough of Juneau

The Kenai Peninsula Borough

Eileen Probasco and the Matanuska-Susitna Borough

Brian Bergman, Mark Buggins and the City and Borough of Sitka

Steve Masterman, Ernie Siemoneit, Shari Howard, Jessie Reinken, Barry Benko and the Alaska Department of Transportation and Public Facilities

Clark Cox and the Alaska Department of Natural Resources, Division of Mining, Land and Water

Misha Vakoc and the Region 10 United States Environmental Protection Agency, Office of Water

Cover Photo Credits:
Top photo: Used with permission of Central Paving Products, Palmer, Alaska
Bottom left photo: DEC
Bottom right photo: Ecology and Environment, Inc.

TABLE OF CONTENTS

Lists of Tables and Figures

Figure **Page**

ACRONYMS

AAC	Alaska Administrative Code
BMP	Best Management Practices
DEC	Alaska Department of Environmental Conservation
EPA	United States Environmental Protection Agency
MSGP	Multi-Sector General Permit
NOI	Notice of Intent
NPDES	National Pollutant Discharge Elimination System
NTU	Nephelometric Turbidity Units
SWPPP	Storm Water Pollution Prevention Plan
TAH	Total Aromatic Hydrocarbon
TaqH	Total Aqueous Hydrocarbon

1 INTRODUCTION

1.1 Why you need to read this manual

Key Points – Chapter 1

- The manual provides information of best management practices at gravel pit operations where there is a potential impact to water quality of surface water bodies
- The manual provides meaningful and comprehensive guidelines that would reduce impacts to surface water quality

This manual outlines and frames best management practices (BMPs) for gravel pit operations where stormwater runoff may impact the water quality lakes, rivers, streams, and wetlands.

It will help gravel pit owners and operators in establishing BMP's that will result in cleaner water, help fulfill obligations to a permit and take the guess work out of developing BMP's and pollution control measures for gravel pits throughout Alaska. This manual does not include BMPs for in-stream operations.

We've organized this manual into the sections described below:

Chapter 1 – Why you need to read and how to use this manual.
Chapter 2 – Key terms and need for the guidance.
Chapter 3 – State and federal permit requirements.
Chapter 4 – Different types of BMPs.
Chapter 5 – How to choose the most effective BMPs.
Chapter 6 – A list of references used in the guidance.

Appendix A - Provides definitions for terms used in the User's Manual.
Appendix B – Lists contacts throughout Alaska for additional information on gravel pit BMPs and requirements.
Appendix C – Provides additional resources of information.
Appendix D – Provides limited information regarding state and federal permit requirements.
Appendix E – Is a catalog of BMP fact sheets for your use.

1.2 How to Use the Manual

These techniques and practices can be applied to both small and large-scale operations. It is specifically developed to address gravel pit extraction that is not in-river or in gravel bars. If you or your staff do not have extensive experience in designing and implementing control measures, you will benefit from review of the entire manual. Personnel that have previous experience with the planning, design and implementation of stormwater BMPs may benefit primarily from the information provided in Appendix E – Best Management Practice Fact Sheets.

What is stormwater run off and why should I care?

Key Points – Chapter 2

- Excess sediment in streams can kill fish and destroy fish habitat.
- BMPs are an effective way to control pollution.
- Using BMPs at your site may result in more money in your pocket and more fish in Alaska's streams.
- Source controls are generally more cost effective, easier to implement, and more effective at minimizing pollution than treatment controls.

Stormwater is water runoff from rain and melting snow. Runoff can be sheet flow off of a site or it can drain to ditches and storm drains that route it to creeks, lakes and marine water. In some areas runoff is routed to storm drains, which then discharge to surface waters. When stormwater flows across exposed soils, construction sites, or pavement, it can pick up and carry sediment, oil, bacteria, road runoff and other pollutants. Sediment and associated pollutants can clog ditches and culverts, destroy habitat and reduce oxygen for fish, and be toxic to aquatic life. Stormwater runoff is a common cause of water pollution and is a challenge to control.

Gravel pits occur throughout Alaska, and their improper operation can result in water quality impacts and impairment. Over the past few years, the Alaska Department of Environmental Conservation (DEC) has received increasing numbers of concerns regarding gravel pit operations and potential impacts to surface water quality.

Several potential pollutants from gravel pits include sediment, turbidity, total metals, and/or petroleum hydrocarbons. An increase in turbidity within a stream environment may result in a potential decrease in available free oxygen necessary to support aquatic life. An increase in the concentration of total suspended solids, such as silt or decaying plant matter, may destroy water supplies for human, animal, and other wildlife consumption, as well as feeding and nesting habitats by reducing oxygen or increasing temperature. Implementation of erosion prevention controls consistent with sound operations can minimize the adverse impacts associated with increased sediment yield. Increased sediments in water can potentially damage fish by abrasion to gills and damage to fish redds, which is a nest of fish eggs covered with gravel, by burying or smothering.

One of the most effective ways to control pollution is the use of effective BMPs. BMPs are physical, chemical, structural, and/or managerial techniques to minimize water pollution. BMPs are implemented at two general levels:

- ***Source controls***: practices that prevent pollutants from coming in contact with stormwater-the most cost effective method of controlling pollution.
- ***Treatment controls***: practices that treat stormwater once it has come into contact with pollutants.

Source controls are given priority over treatment controls, as they are generally more cost effective, easier to implement, and more effective at minimizing pollution.

2 BENEFITS OF BEST MANAGEMENT PRACTICES

Properly selected and maintained BMPs can result in economic and environmental advantages for gravel extraction businesses in Alaska.

Some of the **economic benefits** gained from an aggressive soil stabilization plan for a gravel pit may include:

- Stabilized slopes require less repair and are safer for operators;
- Reducing short- and long-term erosion will result in less soil loss;
- Reduction in restoration costs at the end of the project;
- Negative public opinion can be minimized;
- Liability exposure can be decreased; and
- The potential for monetary fines from non-compliance to a permit can be reduced or eliminated.

Some of the **environmental benefits** of effective BMPs are:

- Protection of fish spawning areas, their food sources and habitat;
- Reduction of toxic materials that are introduced into the environment by their attachment and transport by sediment particles;
- Lowered impact on commercial fisheries from decreased sediment;
- Improved water storage capacities in lakes and wetlands; and
- Protection of receiving waters with designated uses such as recreation and wildlife habitat.

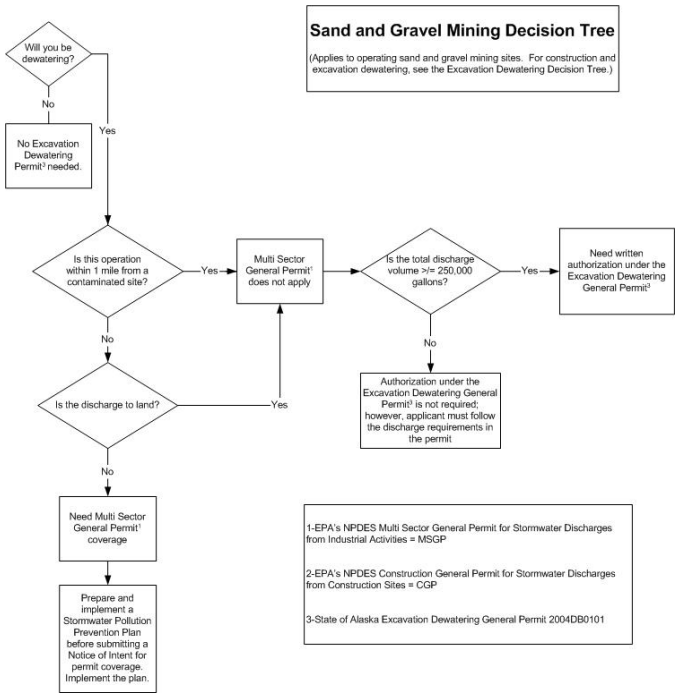
3 REGULATORY REQUIREMENTS

This chapter provides a brief description of the Environmental Protection Agency's National Pollutant Discharge Elimination System (NPDES) Multi-Sector General Permit, DEC's Excavation Dewatering General Permit, and the Alaska Water Quality Criteria as they apply to gravel pits. This is not intended to be a complete list of regulatory requirements but instead to provide a brief introduction to major regulations for gravel pits with respect to stormwater.

Key Points – Chapter 3

Links to Key Documents:

- EPA's Multi-Sector General Permit: http://cfpub.epa.gov/npdes/stormwater/msgp.cfm
- DEC's Excavation Dewatering General Permit: http://info.dec.state.ak.us/decpermit/wq/2004db0101_pmt.pdf
- Alaska Water Quality Criteria (18 AAC 70): http://www.dec.state.ak.us/regulations/index.htm
- EPA's NPDES Website: http://cfpub.epa.gov/npdes/



Appendix D has a more detailed list of permitting requirements and associated flow chart gravel for mining operations.

3.1 NPDES Multi-Sector General Permit and Other NPDES Requirements

Certain stormwater discharges, including those from industrial sites such as gravel pits, are regulated under the Environmental Protection Agency's (EPA) NPDES program. In the state of Alaska, EPA is currently the NPDES permitting authority. However, pursuant to Section 401 of the Clean Water Act, the state of Alaska certifies EPA permits and when it does, the permit becomes enforceable by the state.

Both the discharge of stormwater and the discharge of dewatering effluent (uncontaminated groundwater) from gravel pit operations have been permitted under the NPDES Multi-Sector General Permit (MSGP) under Sector J (Mineral Mining and Dressing) in Alaska since 1995.

To apply for permit coverage under the MSGP, a facility operator must complete and submit to EPA a Notice of Intent (NOI) form. To comply with the permit, the facility operator must prepare and follow a Storm Water Pollution Prevention Plan (SWPPP) and provide a copy of the NOI and a copy of the SWPPP to DEC. DEC must review and approve the SWPPP prior to any discharge. To discontinue permit coverage, a facility operator must complete and submit to EPA a Notice of Termination form.

There are certain circumstances where a general permit is either not available or not applicable to a specific operation or facility. In this type of situation, a facility operator must obtain coverage under an individual permit. EPA will develop with requirements specific to the facility. If a facility requires an Individual Permit, DEC will review the NPDES draft permit and apply any Alaska –specific conditions in its 401 certification of the permit

For certain activities and parts of the state, other general NPDES permits are available and required, rather than the MSGP. For example, for North Slope Oil and Gas Exploration activities, gravel pits/material sites used for construction of pads and roads are permitted under a Slope-wide NPDES General Permit AKG33-0000. Operators must apply to EPA Region 10 for coverage under this permit.

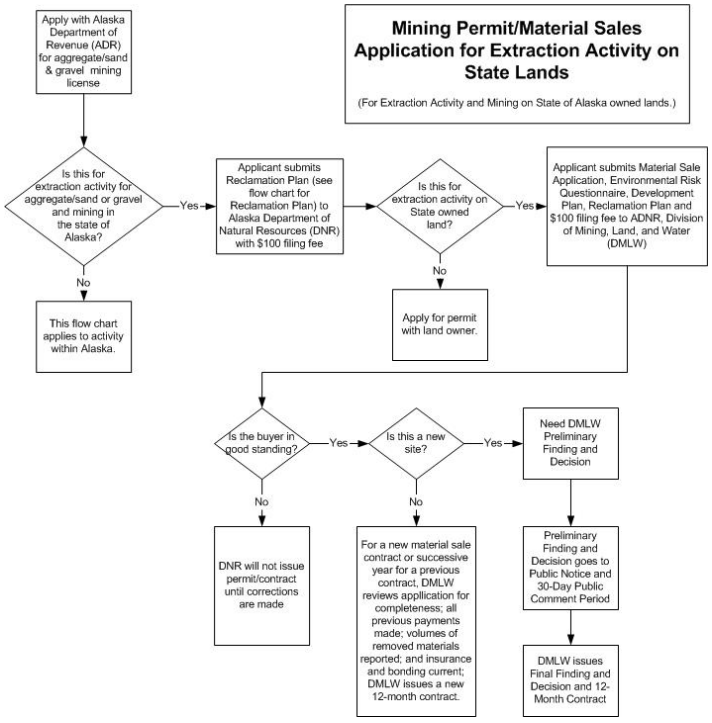
3.2 Excavation Dewatering General Permit

Authorization for excavation dewatering is covered under DEC's Wastewater Disposal General Permit (Permit No. 2004DB0101). The general permit covers wastewater disposal from excavations on sites located less than one mile from a contaminated site and excavations located more than one mile from a contaminated site not eligible for

coverage under the NDPES MSGP. Eligible projects covered under this general permit include gravel extraction.

A Notice of Disposal must be submitted to DEC when a total excavation dewatering discharge volume equal to or greater than 250,000 gallons is planned. A Notice of Disposal is not required if the total discharge volume is less than 250,000 gallons. However, it is important to note that the water quality standards in 18 AAC 70 and the terms and conditions of the general permit still apply. If DEC determines that a known contaminated site is located within one mile of a proposed dewatering activity and the wastewater discharge volume is equal to or greater than 250,000 gallons, additional information regarding the contaminated site, hydrogeologic conditions at the site may be needed. Monitoring wells and/or proposed treatment may be additionally required. Monitoring requirements are listed in the general permit.

Management practices must ensure that the dewatering operation is conducted so that the terms of the general permit are met. Some BMPs are outlined in the permit. This may include leaving the dewatering site, including any settling ponds, in a condition that will not cause degradation to the receiving water beyond that resulting from natural causes. If an earthen channel to transport wastewater from a dewatering operation to the receiving water is used, construction equipment should not be driven in the channel, which will result in re-suspended sediment. Fuel handing and storage facilities shall be managed to ensure petroleum products are not discharged into receiving waters.



The DEC dewatering permit was intended to authorize short-term discharges associated with construction. Gravel pits tend to be on-going projects, sometimes planned in phases.

Although DEC has not issued an individual permit for a gravel operation, it is an option for larger, on-going gravel extraction with wastewater discharge associated with it.

3.3 Alaska Water Quality Criteria

Water quality criteria adopted by the State of Alaska are found in the Water Quality Standards in 18 AAC 70.020(b) and the DEC's *Alaska Water Quality Criteria Manual for Toxic and Other Deleterious Organic and Inorganic Substances* (May 15, 2003). These criteria were taken from the EPA criteria documents and Alaska Drinking Water Regulations in 18 AAC 80. Although these EPA criteria documents are no longer adopted directly into state regulation, they contain valuable information on the science used to create the criteria limits and may affect how the criteria are applied or modified. DEC can use these criteria as limits in the absence of mixing zones or other water quality standard exceptions in 18 AAC 70.

Pollutants that might be expected in the discharge from gravel pits are sediment, turbidity, total metals, and petroleum hydrocarbons. Tables 1 and 2 contain numeric surface water quality standards for sediment, turbidity, and petroleum products in freshwater and marine waters. Narrative criteria are not included in Tables 1 and 2. Criteria for total metals can be found in *Alaska's Water Quality Criteria Manual for Toxic and Other Deleterious Organic and Inorganic Substances* (2003), www.dec.state.ak.us/regulations/index.htm. Alaska' regulations (18 AAC 70) should be consulted for a full list of requirements, both numeric and descriptive criteria, and uses.

Photo: Ecology & Environment, Inc.

Table 1. Summary of Selected Freshwater Criteria from 18 AAC 70.020(b)[1]

Pollutant	Water Use	Criteria
Sediment	Water Supply – Agriculture	For sprinkler irrigation, water must be free of particles of 0.074 mm or coarser. For irrigation or water spreading, may not exceed 200 mg/l for an extended period of time.
	Growth and Propagation of Fish, Shellfish, Other Aquatic Life, and Wildlife	Percent accumulation of fine sediment in the range of 0.1 mm to 4.0 mm in the gravel bed of waters used by an anadromous or resident fish for spawning may not be increased more than 5% by weight above natural conditions. In no case may the 0.1 mm to 4.0 fine sediment range in those gravel beds exceed a maximum of 30% by weight.
Turbidity	Water Supply – Drinking, culinary, and food processing	Nephelometric turbidity units (NTU) may not exceed 5 above natural conditions when the natural turbidity is 50 NTU or less. May not have more than 10% increase in turbidity when natural turbidity is more than 50 NTU, not to exceed a maximum increase of 25 NTU.
	Water Supply – Aquaculture & Growth and Propagation of Fish, Shellfish, Other Aquatic Life, and Wildlife	May not exceed 25 NTU above natural conditions. For all lake waters, may not exceed 5 NTU above natural conditions.
	Water Recreation – Contact	May not exceed 5 NTU above natural conditions when the natural turbidity is 50 NTU or less. May not have more than 10% increase in turbidity when natural turbidity is more than 50 NTU, not to exceed a maximum increase of 15 NTU. For all lake waters, may not exceed 5 NTU above natural conditions.
	Water Recreation – Secondary recreation	May not exceed 10 NTU above natural conditions when the natural turbidity is 50 NTU or less. May not have more than 20% increase in turbidity when natural turbidity is more than 50 NTU, not to exceed a maximum increase of 15 NTU. For all lake waters, may not exceed 5 NTU above natural conditions.
Petroleum Hydrocarbons	Water Supply – Aquaculture & Growth and Propagation of Fish, Shellfish, Other Aquatic Life, and Wildlife	Total aqueous hydrocarbons (TaqH) in the water column may not exceed 15 μg/L. Total aromatic hydrocarbons (TAH) in the water column may not exceed 10 μg/L.

[1] Refer to regulations for full description of criteria and designated uses.

Table 2. Summary of Selected Marine Water Criteria from 18 AAC 70.020(b)[1]

Pollutant	Water Use	Criteria
Sediment		No numeric criteria. See 18 AAC 70 for descriptive criteria.
Turbidity	Water Supply – Aquaculture & Water Recreation (Contact and Secondary)	May not exceed 25 NTU.
	Growth and Propagation of Fish, Shellfish, Other Aquatic Life, and Wildlife & Harvesting for Consumption of Raw Mollusks or Other Raw Aquatic Life	May not reduce depth of the compensation point for photosynthetic activity by more than 10%. May not reduce the maximum secchi disk depth by more than 10%.
Petroleum Hydrocarbons	Water Supply – Aquaculture & Growth and Propagation of Fish, Shellfish, Other Aquatic Life, and Wildlife	TaqH in water column may not exceed 15 μg/L. TAH in water column may not exceed 10 μg/L.

[1] Refer to regulations for full description of criteria and designated uses.

2 BEST MANAGEMENT PRACTICES

Types of management controls, used to protect surface water from stormwater runoff are briefly discussed below. For a full description of individual BMPs appropriate for Alaska conditions, please see Appendix E –Best Management Practice Fact Sheets. Information from Section 5 should be considered when determining the priority and appropriateness of each BMP to a particular project.

In all situations, BMPs should be inspected regularly to identify areas in need of maintenance or improvement to minimize pollutant discharges.

Key Points – Chapter 4

- Source controls are usually more cost effective, easier to implement, and more effective than treatment control.
- Erosion prevention keeps soil in place and is more effective and preferred over sediment controls.
- Several factors, including climate and soil type, impact the effectiveness of a BMP.
- Before dewatering, check to make sure all applicable permits are in place.

2.1 Source Controls

Source controls are practices that prevent pollutants from coming in contact with stormwater. Source controls are, in general, more cost effective, easier to implement, and more effective at minimizing pollution. Source controls should be given priority over treatment controls.

2.1.1 Stormwater Diversions and Management of Runoff

Diverting stormwater away from potential pollutant sources and/or managing runoff from a site are one category of source control BMPs. Numerous factors may affect the amount of runoff generated from a site, including the following:

- Precipitation;
- Soil permeability;
- Watershed area; and
- Ground cover.

Photo: Ecology & Environment, Inc.

Examples of stormwater diversions include the following:

- Interceptor and diversion controls such as dikes, ditches, curbs, or berms;
- Pipe slope drains;
- Subsurface drains; and

- Conveyance systems such as channels or gutters, open-top box culverts, waterbars, rolling dips and road sloping, roadway surface water deflector,and culverts.

Erosion control systems cannot perform adequately without the control of runoff. It is important to control flow of runoff to prevent scouring exposed soil.

The following runoff BMPs are discussed in Appendix E:

- Berms
- Ditches

2.1.2 Erosion and Sediment Control

In planning, implementing, and maintaining an erosion and sediment control system, it is important to understand the difference between erosion prevention and sediment control.

Erosion Prevention is any practice that protects the soil surface and prevents the soil particles from being detached by rainfall, snowmelt, or wind.

Sediment Control is any practice that traps the soil particles after they have been detached and moved by wind or water. Treatment controls, as well as source controls, can be used in controlling the transport of sediment. Such controls include passive systems that rely on filtering or settling the particles out of the water or wind that is transporting them.

Generally speaking, erosion prevention is more effective than sediment controls, and is preferred because they keep the soil in place and enhance the protection of the site resources.

This culvert captures sediment at a material extraction site that is operated by the City and Borough of Sitka. Photo courtesy of DEC.

When implementing erosion and sediment control BMPs, the following principles should be adhered to as much as possible:

- Fit the natural topography, soils, and vegetation of the site;
- Minimize disturbances to natural vegetation;

- Minimize soil exposure during high precipitation storm events;

Photo: Ecology & Environment, Inc.

- Vegetate clear areas;
- Minimize concentrated flows and divert runoff away from slopes or critical areas;
- Minimize slope steepness and slope length;
- Utilize channel linings or temporary structures in drainage channels to slow runoff velocities;
- Keep sediment on-site using sediment basins, traps, or sediment barriers; and
- Monitor and inspect the site frequently and correct problems promptly.

The following erosion and/or sediment control BMPs are discussed in Appendix E:

- Backfilling
- Buffer zone
- Grading
- Haul Roads
- Retention Basin
- Settling Pond
- Silt Fence
- Topsoil Management
- Vegetation Cover
- Wind Protection

2.2 Treatment Controls

Treatment of stormwater through chemical or physical systems, such as oil and water separators, or artificial wetlands may be necessary to protect water quality. Passive and/or active treatment of stormwater runoff is encouraged. As mentioned, source controls are preferred over treatment controls. For more information on specific treatment controls see Appendix C – Resource of Information. Some treatment controls will require approval and/or a permit. See Section 3 and Appendix D for additional information on permit requirements.

2.3 Operational Controls

It is important to effectively maintain all BMPs for optimal performance. When choosing BMPs maintenance cost and time should always be considered. For BMPs to be successful, operators and employees should be trained in BMP construction, maintenance and permit requirements as applicable. Annual training at active gravel pits may be necessary and requires an on going commitment from the owners and operators.

The following operational controls are discussed in Appendix E:

- Employee Training
- Environmental Timing Windows
- Self Environmental Audit
- Street Cleaning/Sweeping
- Vibration Reduction
- Wheel Washer

2.4 Dewatering Practices

Dewatering is sometimes necessary for gravel pit operations in Alaska during gravel extraction or while cleaning settling or retention ponds. When dewatering 250,000 gallons or more and/or when operations occur within 1-mile of a contaminated site DEC's Excavation Dewatering General Permit is required. The DEC will provide more information on conditions and best management practices for a specific site in its permit. The DEC permit will include the BMPs for the dewatering but in general the DEC recommends using well points to draw down the aquifer prior to mining so that the aquifer will not be exposed. This is the preferred method over using a sump or trash pump to dewater a pit while mining after the aquifer is exposed.

Flow-through pits, such as when a creek flows into one side of a pit and flows out the other, will not be permitted without BMPs. While BMPs for mining in flowing water are not discussed in this document, it is noted that for in-water work a U.S. Army Corps of Engineers Section 404 permit for discharging dredged or fill material would be required.

Dewatering controls are discussed in Section E.

3 HOW TO CHOOSE BEST MANAGEMENT PRACTICES

The first step in selection of BMPs is to evaluate the project-specific needs, local, regional, and statewide issues, concerns and requirements. This evaluation will influence aspects of planning, including the selection of the BMPs, and the time frame for implementation.

Key Points – Chapter 5

- The selection of a BMP will most likely be driven by cost, effectiveness, availability, feasibility, durability, compatibility, and operation.
- Precipitation and winds in the area should be considered when choosing BMPs for a site.
- State and federal requirements may apply if pit dewatering, mining below the watertable, or gravel washing occur at the site.

Issues for consideration include:

- Nature of the project (i.e. activities, timing, and scope of project);
- Proximity of sensitive receiving waters;
- Regulatory environment; and
- Public perception. By implementing effective BMPs you are a better neighbor.

Selection criteria for determining the appropriate BMP for a project and other considerations are discussed in this section. In most cases, one BMP will not meet all the goals of the project. An integrated plan for stormwater control and treatment most likely will be needed. Multiple BMPs may be needed at a single gravel pit to meet all the project goals. BMPs being used vary seasonally, are site specific, and depend on which phase of operation the gravel mine is in.

3.1 Considering Which BMP Will Work Best for Your Needs

In order to determine best practices for a specific project, a menu of potential BMPs should be identified with the goals of the project in mind. Selection criteria for BMPs can include:

Photo: Ecology & Environment, Inc.

- Effectiveness
- Implementation cost
- Temporary vs. permanent
- Cost of construction
- Long-term cost (operation and maintenance)
- Suitability for the site, including environmental compatibility
- Regulatory acceptability
- Availability

- Durability
- Longevity
- Ability to achieve vegetation schedule
- Technical feasibility
- Public acceptability
- Risk/liability

Of these criteria cost, effectiveness, availability, feasibility, durability, compatibility and operation most likely will drive the selection of a particular BMP. Each of these factors is discussed below. Information was obtained from Oregon Department of Environmental Quality's *Erosion and Sediment Control Manual* (April 2005).

Cost. Things to include in the evaluation of cost effectiveness of a BMP include material costs, preparation costs, installation costs, maintenance costs, and cost of government requirements.

Effectiveness. Factors to be considered relative to BMP effectiveness include:

- Amount of cover on the soil surface;
- Balance between runoff/infiltration;
- Sediment reduction capabilities (ability to trap and retain sediment and prevent mobilization of soil particles);
- Reduction in water velocity (lower water velocity means less erosion potential); and
- Soil texture sensitivity (some practices work better on different types of soils; other practices are unaffected by soil texture).

Availability. The BMP materials must be readily available from a local supplier or be capable of immediate shipment to the area within the timeframe designated by the plans. This may be a significant issue in Alaska, specifically in areas not accessible by a road year round.

Feasibility. The BMP materials must be capable of relatively quick and easy application with minimal training required. Each BMP should be considered for its flexibility or applicability to a variety of field conditions. Factors to be considered relative to feasibility include:

- The number of steps needed to apply the BMP;
- Whether machinery is required;
- Whether locally available materials can be utilized; and
- The time required for the BMP to be operational-this might be a climate or timing consideration..

Durability and Compatibility. Given the nature of the site conditions, the BMP materials must maintain their structural integrity throughout use. History of durability in Alaska or cold weather climate is important. Environmental compatibility is also highly important.

For example, if using a vegetative cover BMP, the plants chosen for the vegetative cover must be compatible with native plants and the climate. The State of Alaska suggests using native plants. Contact the Plant Materials Center listed in Appendix B if you have questions.

Operation. Regardless of the BMPs selected, follow-up is always required. Maintenance and repair requirements should be considered. Training of staff for BMP operation may be required for optimal effectives of the BMP selected.

Information regarding the required material, equipment, costs, specifications (including operation and feasibility) and compatibility for individual BMPs is provided in the fact sheets located in Appendix E. A summary of relative cost, equipment, maintenance, and employee training requirements is provided in Table 3, BMP Selection Matrix. The list of BMPs is based on feasibility and past success in Alaska.

Table 3. BMP Selection Matrix

Selection Criteria / BMPS	Cost	Equipment	Maintenance	Employee Training
Backfilling	$ - $$$	✎✎	🛠	🧍
Berm	$$	✎✎	🛠🛠	🧍
Buffer Zone	$ - $$	✎	🛠	🧍
Ditches	$ - $$	✎	🛠🛠	🧍
Employee Training	$ - $$	✎	🛠🛠	🧍🧍🧍
Environmental Timing Windows	$ - $$	N/A	🛠	🧍
Grading	$	N/A	🛠	🧍
Haul Roads	$$ - $$$	✎✎	🛠🛠🛠	🧍
Retention Basin	$ - $$$	✎✎	🛠	🧍
Self Environmental Audit	$ - $$	✎	🛠	🧍🧍
Settling Pond	$ - $$$	✎✎	🛠🛠	🧍
Silt Fence	$	✎✎	🛠🛠	🧍🧍
Street Cleaning/Sweeping	$	✎	🛠🛠	🧍
Topsoil Management	$	✎	🛠	🧍
Vegetation Cover	$	✎	🛠	🧍🧍
Vibration Reduction	$ - $$$	✎	🛠	🧍🧍🧍
Wheel Washer	$$ - $$$	✎✎	🛠	🧍🧍
Wind Protection	$	✎	🛠	🧍

Key:

$ = Cost. Low ($) to high ($$$) cost represented.
✎ = Equipment requirements. Minimal equipment requirements (✎) to substantial equipment needs represented (✎✎✎).

🛠= Maintenance requirements. Low (🛠)_to high (🛠🛠🛠) maintenance requirements represented.

🧍 = Employee training needs to implement BMP. BMPs requiring minimal or no employee training (🧍) to substantial and possibly reoccurring training (🧍 🧍 🧍) represented.

3.2 Environmental Considerations

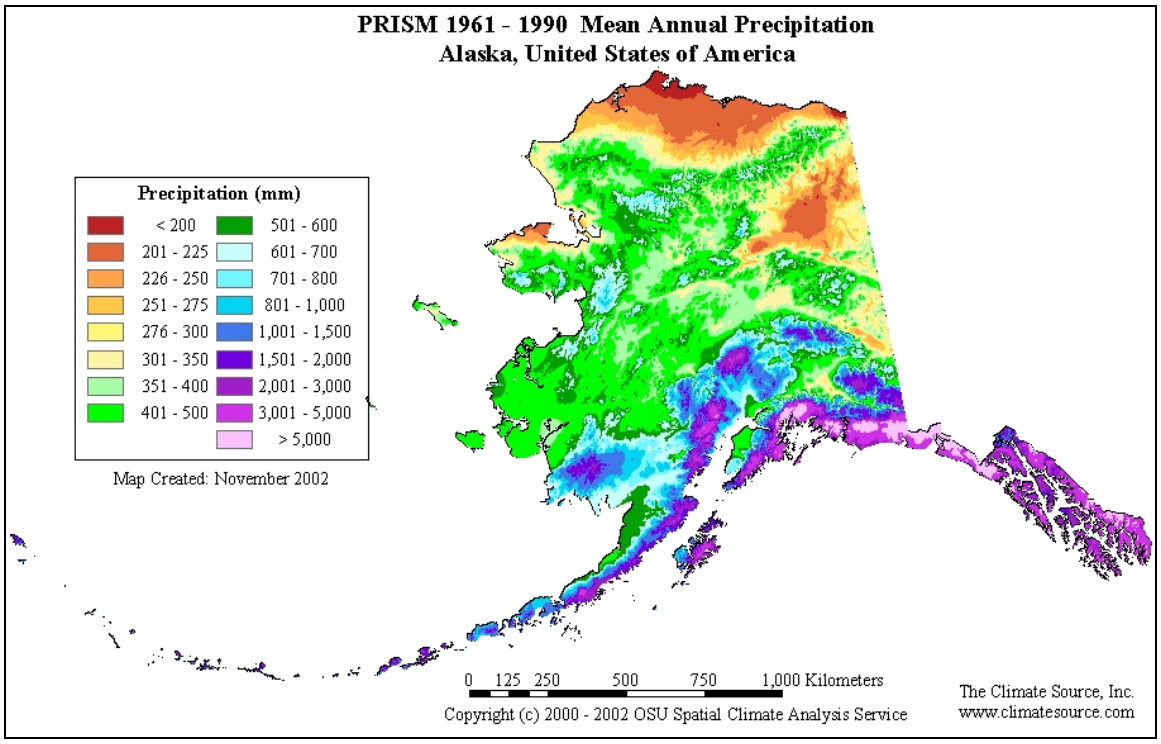
Environmental conditions should be considered when determining which BMPs to use at a site and when they would be most effective. Climate, particularly precipitation and winds, may have the biggest impact on what type of BMPs are needed for stormwater control. Operations should be timed to reduce erosion or stormwater runoff.

Photo: Ecology & Environment, Inc.

Alaska's weather and climate are highly diversified. Precipitation amounts, duration, and intensity can have a strong influence on stormwater and the need for diverting or controlling runoff. Mean annual precipitation in Alaska is shown in the Figure 1. As shown in this figure, Southeast Alaska and parts of Southcentral receive over 2,000 mm (approximately 78 inches) of precipitation a year. In areas of high precipitation, BMPs targeted to divert or manage runoff may be needed.

Photo: Ecology & Environment, Inc.

Figure 1. Mean Annual Precipitation, Alaska



High winds can impact erosion of exposed soil. A normal storm track along the Aleutian Island chain, the Alaska Peninsula, and all of the coastal area of the Gulf of Alaska exposes these parts of the state to a large majority of the storms crossing the North Pacific, resulting in a variety of wind problems. Direct exposure results in the frequent occurrence of winds in excess of 50 mph during all but the summer months. Wind velocities approaching 100 mph are not common but do occur, usually associated with mountainous terrain and narrow passes. Winter storms moving eastward across the southern Arctic Ocean cause winds of 50 mph or higher along the arctic coast. Except for local strong wind conditions, winds are generally light in the interior sections (Western Regional Climate Center 2006). Erosion control BMPs should be used in areas with high winds or during high wind seasons.

Some issues to consider when choosing BMPs include the following:

- Where possible, significant grading operations or exposure of soil should be planned during periods of low rainfall.
- Total exposed soil areas and duration of exposure should be reduced during high rainfall times.
- Wheel washing activities may be needed during high rain events to reduce tracking of sediments.

- Sediment control measures such as berms and silt fencing may not alone adequately reduce discharge during high rainfall.
- Runoff may need to be diverted during high rain events.
- BMPs may need increased inspection and maintenance in areas or times of high rainfall.

3.3 Choosing the Right BMPs for Your Location

In addition to criteria discussed in section 5.1 above, the selection of appropriate BMPs for surface water protection from stormwater runoff may benefit from consideration of seasonality, rainfall, topography, proximity to water bodies, and soil permeability. In a natural, undeveloped setting, stormwater runoff is largely determined by permeability, and presence or absence of vegetation. For operations such as gravel pits, BMPs may be needed to effectively manage run.

Photo: Ecology & Environment, Inc.

Below are some examples. For a full discussion of when to use specific BMPs see Appendix E - BMP Fact Sheets.

BMPs specifically designed to address steep slopes include the following:

- Backfilling

BMPs specifically designed to address exposed soil include the following:

- Wind Protection
- Vegetative Cover
- Grading

If there is a concern with tracking material off the site, the following BMPs may be effective:

- Wheel Washing
- Street Cleaning/Sweeping

Photo: Ecology & Environment, Inc.

If the gravel pit operations are in close proximity to sensitive areas, such as fish spawning or habitat, the following BMPs may be effective:

- Berms
- Buffer Zones
- Ditches
- Environmental Timing
- Silt Fencing
- Settling Ponds
- Retention Basin

Photo: Ecology & Environment, Inc.

Types of management controls, used to protect surface water from stormwater runoff are briefly discussed below. For a full description of individual BMPs appropriate for Alaska conditions, please see Appendix E –Best Management Practice Fact Sheets. Information from Section 5 should be considered when determining the priority and appropriateness of each BMP to a particular project.

In all situations, BMPs should be inspected regularly to identify areas in need of maintenance or improvement to minimize pollutant discharges.

3.4 Special Conditions

In addition to the issues discussed previously in this section, some projects may need to consider special operations in choosing appropriate BMPs. Some situations that require special consideration include the dewatering of an excavation pit, mining of gravel below the watertable, and gravel washing operations.

3.4.1 Pit Dewatering

If excavation dewatering is needed, BMPs may also be required to minimize any adverse impacts to the receiving waters resulting from dewatering activities. In general, DEC recommends using well points that lower the aquifer prior to mining so that the aquifer will not be exposed. This is the preferred method over using a sump or trash pump to dewater a pit while mining after the aquifer is exposed.

Authorization under the Excavation Dewatering General Permit must be obtained for discharges to land of equal to or greater than 250,000 gallons. For discharges less than this volume, authorization under the Excavation Dewatering General Permit is not required however the discharge requirements in the permit must be followed. If an operation is within 1 mile from a contaminated site, the MSGP does not apply and authorization under the Excavation Dewatering General Permit may be required. The MSGP cover excavation pit dewatering discharges to water. A Stormwater Pollution Prevention Plan must be prepared before submitting a Notice of Intent for coverage under this permit.

Flow through pits, where a creek comes in one side of the pit and out the other, will not be permitted without BMPs. If mining in flowing water then the water is not considered treatment works. An individual Army Corps of Engineers Section 404 permit would be required. DEC's certification of the Corps permit might grant a shot-term variance for water quality standards or specify conditions to ensure that the water leaving the pit meet Alaska Water Quality Standards. For information on permitting requirements, see Appendix D.

3.4.2 Mining Below Watertable

Groundwater may become exposed when mining below the watertable. During the active operation phase of a gravel pit, the top portion of the groundwater is considered treatment works, as authorized under 18 AAC 60 or 18 AAC 72, as long as it does not come in contact with hazardous contaminants. When operations at the gravel pit cease, the exposed groundwater is once again considered a water of the state. Concerning waters of the state, the water will need to comply with water quality standards based on the applicable designed use. Whenever land is disturbed for mining purposes, including sand and gravel extraction, the site must conform to a reclamation plan.

When mining below the watertable, the following BMPs are recommended:

- Keep equipment maintenance away from the pit perimeter;
- Waste disposal away from the pit, unless waste is considered exempt waste under 18 AAC 60.006(c); and
- Storage of fuels and hazardous materials away from the open pit.

The proximity of the pit to contaminated sites should be considered (see dewatering discussion above). If substantial draw down may occur due to dewatering, a contaminant plume from a contaminated site may move or be exacerbated. DEC Contaminated Site Program staff should be contacted in this instance.

3.4.3 Gravel Washing Operations

Some gravel may require additional processing, such as washing. These types of operations discharge to a settling pond for infiltration. Gravel washing may cause an increase in turbidity. BMPs should be chosen that manage and possibly treat the runoff. For instance, settling ponds can remove silt and suspended clays from water used for washing aggregate. Gravel washing operations need a permit if discharging offsite or if causing a chemical change in the groundwater. These permitting requirements are beyond the scope of this manual.

3.4.4 Small Projects

This guidance can be used at both small-scale gravel pit operations as well as larger facilities. Although some BMPs presented are specific to large operations, many can be used for smaller projects, as well.

For small projects, the minimum BMPs to consider include:

- Scheduling earth-disturbing activities during appropriate weather.
- Perimeter sediment controls (e.g., buffer zones or silt fencing).
- Storm drain inlet protection (e.g. sediment filter or impounding area).
- Site entrance and exit controls (e.g., wheel washing or street cleaning).
- Covering or otherwise protecting stockpiles
- Slopes susceptible to erosion should also include runoff and erosion prevention measures as described in Section 4.

4 REFERENCES

Alaska Department of Environmental Conservation, 2005, *Alaska's Water Quality Criteria Manual for Toxic and Other Deleterious Organic and Inorganic Substances*, May 15, 2003.

Alaska Department of Environmental Conservation, 2004, *Wastewater Disposal General Permit, Excavation Dewatering Permit, Permit Number. 2004DB0101*, April 20, 2004.

British Columbia, 2002, *Aggregate Operators Best Management Practices Handbook for British Columbia*, Ministry of Energy & Mines, April 2002, http://www.em.gov.bc.ca/Mining/MiningStats/55AOBMPHand_pdf.htm.

Environmental Protection Agency, December 1, 2005, *Proposed 2006 NPDES Multi-Sector General Permits for Stormwater Discharges Associated with Industrial Activity*, http://cfpub.epa.gov/npdes/stormwater/msgp.cfm.

Environmental Protection Agency, October 30, 2000, *NPDES Multi-Sector General Permits for Stormwater Discharges Associated with Industrial Activity*, http://cfpub.epa.gov/npdes/stormwater/msgp.cfm.

Oregon Department of Environmental Quality, 2005, *Erosion and Sediment Control Manual*, April 2005.

The Climate Source Inc., 2006, *PRISM 1961 – 1990 Mean Annual Precipitation, Alaska*, http://www.climatesource.com/ak/fact_sheets/akppt_xl.jpg.

Western Regional Climate Center, 2006, *Historical Climate Information, Alaska Narrative*, http://www.wrcc.dri.edu.

Appendix A – Definitions

Below is a compilation of definitions used or pertaining to this User's Guide. Additional definitions can be found in the Alaska Water Quality Standards (18 AAC 70).

Best Management Practices (BMPs) – Schedules of activities, prohibitions of practices, maintenance procedures, and structural and/or managerial practices, that when used singly or in combination, prevent or reduce the release of pollutants and other adverse impacts to waters of the state. The types of BMPs are source control and treatment control.

Mining Operations – Typically consists of three phases, any one of which individually qualifies as a "mining activity." The phases are the exploration and construction phase, the active phase, and the reclamation phase.

Nonpoint Source Pollution – Any source of pollution other than a point source (18 AAC 70.990(42)). Point source pollution is a discernible, confined, and discrete conveyance, including a pipe, ditch, channel, tunnel, conduit, well, container, rolling stock, or vessel or other floating craft, from which pollutants are or could be discharged (18 AAC 70.990(46)).

Residues - Floating solids, debris, sludge, deposits, foam, scum, or any other material or substance remaining in a waterbody as a result of direct or nearby human activity (18 AAC 70.990(49)).

Sediment – Solid material of organic or mineral origin that is transported by, suspended in, or deposited from water. Sediment includes chemical and biochemical precipitates and organic material, such as humus (18 AAC 70.990(51)).

Settleable Solids - Solid material of organic or mineral origin that is transported by and deposited from water, as measured by the volumetric Imhoff cone method and at the method detection limits specified in method 2540(F), *Standard Methods for the Examination of Water and Wastewater*, 18th edition (1992) (18 AAC 70.990(52)).

Source Control BMPs - Source control BMPs **prevent** pollution, or other adverse effects of stormwater, from occurring. Source controls can be further classified as operational or structural. Examples of source control BMPs include methods as various as using mulches and covers on disturbed soil, slope grading, land clearing practices, putting roofs over outside storage areas, and berming areas to prevent stormwater run-off and pollutant runoff.

Stormwater – Storm water runoff, snowmelt runoff, and surface runoff and drainage (MSGP 2000).

Total Suspended Solids – Solids in water that can be trapped by a filter. Total suspended solids can include a wide variety of material, such as silt, decaying plant and animal

matter, industrial wastes, and sewage. High concentrations of suspended solids can cause many problems for stream health and aquatic life and can block light from reaching submerged vegetation. As the amount of light passing through the water is reduced, photosynthesis slows down. Reduced rates of photosynthesis causes less dissolved oxygen to be released into the water by plants and possibly lead to fish kills. High total suspended solids can also cause an increase in surface water temperature, because the suspended particles absorb heat from sunlight.

Treatment Control BMPs - Treatment control BMPs include facilities or operations that remove pollutants by simple gravity settling of particulate pollutants, filtration, biological uptake, and soil adsorption. Treatment control BMPs can accomplish significant levels of pollutant load reductions if properly designed and maintained. Examples of treatment controls include sediment basins, ditching, vegetative covers, etc.

Turbidity – Turbidity means an expression of the optical property that causes light to be scattered and absorbed rather than transmitted in straight lines through a water sample. Turbidity in water is caused by the presence of suspended matter such as clay, silts, finely divided organic and inorganic matter, plankton, and other microscopic organisms (18 AAC 70.990(64)).

Waters - Alaska statutes (AS) 46.03.900(36) defines waters to include lakes, bays, sounds, ponds, impounding reservoirs, springs, wells, rivers, streams, creeks, estuaries, marshes, inlets, straits, passages, canals, the Pacific Ocean, Gulf of Alaska, Bering Sea, and Arctic Ocean, in the territorial limits of the state, and all other bodies of surface or underground water, natural or artificial, public or private, inland or coastal, fresh or salt, which are wholly or partially in or bordering the state or under the jurisdiction of the state.

Appendix B – Contact Information

State and Federal Contacts

The following are state and federal contacts for additional information regarding gravel pits and BMPs.

Alaska Department of Environmental Conservation
Nonpoint Source Water Pollution Control Program
http://www.dec.state.ak.us/water/wnpspc/index.htm

Juneau
410 Willoughby Ave., Suite 303
P.O. Box 111800
Juneau, Alaska 99801
907-465-5180

Fairbanks
610 University Avenue
Fairbanks, Alaska 99709
907-451-2125

Anchorage
555 Cordova Street
Anchorage, Alaska 99501
907-269-7599

Alaska Department of Environmental Conservation
Contaminated Sites Program
http://www.dec.state.ak.us/spar/csp/index.htm

Juneau
410 Willoughby Ave., Suite 303
P.O. Box 111800
Juneau, Alaska 99801
907-465-5390

Fairbanks
610 University Avenue
Fairbanks, Alaska 99709
907-451-2143

Anchorage
555 Cordova Street
Anchorage, Alaska 99501
907-269-7503

Alaska Department of Natural Resources
Division of Mining, Land & Water
550 West 7th Avenue, Suite 1070
Anchorage, Alaska 99501
907-269-8600
http://www.dnr.state.ak.us/mlw

Alaska Department of Natural Resources
Plant Materials Center
5310 S. Bodenburg Spur
Palmer, Alaska 99645
907-745-4469
http://www.dnr.state.ak.us/ag/ag_pmc.htm

Environmental Protection Agency, Region 10
NPDES Storm Water Coordinator
1200 Sixth Avenue
Seattle, WA 98101
206-553-6650
http://yosemite.epa.gov/R10/WATER.NSF/webpage/Storm+Water?OpenDocument

---

Army Corps of Engineers, Alaska District
Regulatory Branch
P.O. Box 898
Anchorage, Alaska 99506-0898
907-753-2712
http://www.poa.usace.army.mil/reg/

Local Government Contacts

Contact information for local governments in major cities throughout Alaska. Please contact the local governmental organization in your area.

Fairbanks North Star Borough
809 Pioneer Road
P.O. Box 71267
Fairbanks, Alaska 99707-1267
907-459-1000
http://www.co.fairbanks.ak.us/

Matanuska-Susitna Borough
Planning Division
350 East Dahlia Avenue
Palmer, Alaska 99645
907-745-9635
http://www.matsugov.us/LandManagement/

City & Borough of Juneau
Engineering Department
155 South Seward Street
Juneau, Alaska 99801
907-586-0800
http://www.juneau.lib.ak.us/engineering/

City & Borough of Sitka
Public Works Department
100 Lincoln Street
Sitka, Alaska 99835
907-747-3294
http://cityofsitka.com/publicworks/index.html

Kenai Peninsula Borough
144 North Binkley
Soldotna, Alaska 99669
907-262-4441
http://www.borough.kenai.ak.us/

Appendix C – Resources For Additional Information

BMP Methods

Barksdale, R.D., Editor. (1991): The Aggregate Handbook; *National Stone Association*.

Buttleman, C.G. (1992): A Handbook for Reclaiming Sand and Gravel Pits in Minnesota; *Minnesota Department of Natural Resources*, Division of Minerals.

Ciuba, S. and Austin, L. (2001): Runoff Treatment BMPs; *in* Stormwater Management Manual for Western Washington, Volume V. *Washington State Department of Ecology*, Publication 9915, URL<http://www.ecy.wa.gov/biblio/9915.html>, June 2001.

Field, L.Y. and Engel, B.A. (2001): Best Management Practices for Soil Erosion; *Purdue University*, Agricultural and Biological Engineering Department, URL <http://pasture.ecn.purdue.edu/AGEN521/epadir/erosion/asm521.html>, October 2001.

Norman, D.K., Wampler, P.J., Throop, A.H., Schnitzer, E.F. and Roloff, J.M. (1997): Best Management Practices for Reclaiming Surface Mines in Washington and Oregon; *Washington State Department of Natural Resources* Open File Report 96-2 and *Oregon Department of Geology and Mineral Industries* Open File Report O-96-2, 128 pages, URL <http://www.wa.gov/dnr/htdocs/ger/pdf/bmp.pdf>, June 2001.

O'Brien, E. (2001): Minimum Technical Requirements; Stormwater Management Manual for Western Washington, Volume I. *Washington State Department of Ecology*, Publication 9911, URL <http://www.ecy.wa.gov/biblio/9911.html>, June 2001.

Oregon Department of Environmental Quality, 2005, *Erosion and Sediment Control Manual*, April 2005.

United States Department of Agriculture and Mississippi State University. (1999): Water Related BMP's in the Landscape; Watershed Science Institute. Created for the Natural Resource Conservation Service, United States Department of Agriculture by the Center for Sustainable Design Mississippi State University Departments of Landscape Architecture, Agricultural and Biological Engineering, and the College of Agriculture and Life Sciences, URL <http://abe.msstate.edu/csd/NRCS-BMPs/contents.html>, October 2001.

Local BMP Methods

City and Borough of Sitka, 2004, *A Contractor and citizen Guide to Reducing Stormwater Pollution*, June 2004.

Redburn Environmental & Regulatory Services, *Granite Creek Watershed Project Review Guidelines and Pollution Control Recommendations for Future Development*, for City and Borough of Sitka, June 2005.

Additional Information

King County Washington (1999): Stormwater Pollution Control Manual; Department of Natural Resource, Water and Land Division, URL <http://dnr.metrokc.gov/wlr/dss/spcm.htm>, October 2001.

Murphy, M.L. (1995): Forestry Impacts on Freshwater Habitat of Anadromous Salmonids in the Pacific Northwest and Alaska—Requirements For Protection And Restoration; NOAA Coastal Ocean Program, Decision Analysis Series No. 7, *in*. Schmitten R. A., Editor, (1996) NMFS National Gravel Extraction Policy, *U.S. Department of Commerce National Marine Fisheries Service*, URL < http://swr.ucsd.edu/hcd/gravelsw.htm>, June 2001.

North Carolina Department of Natural Resources and Community Development. (1988): Erosion and Sediment Control Planning and Design Manual; North Carolina Sediment Control Commission.

United States Department of Agriculture. (2000): Ponds--Planning, Design, and Construction; Agriculture Handbook Number 590.

United States Department of Agriculture, (1994): Planning and Design Manual for the Control of Erosion, Sediment, and Stormwater, Best Management Practice Standards.

Appendix D – State and Federal Permitting Requirements

The table and associated flowcharts in this appendix provide an overview of state and federal requirements for gravel pit operations. **Not all requirements or permits might be identified or applicable.** In addition, local regulations or permits may be required. Please check with the responsible agency and local government agency to identify which apply to your operation.

Issue	Responsible Agency	Agency Requirement
Mining License	AK Dept. of Revenue	Provide copy of approved aggregate/sand & gravel mining license.
Mining Permit	ADNR	Provide copy of approved aggregate/sand & gravel mining permit, if extraction activity is conducted on state land.
Reclamation	ADNR	Provide copy of approved state reclamation plan, if required (not required if less than 5 acres).
Water Quality – Run-off	EPA DEC	Provide copy of EPA notice of intent for construction general permit or Multi-Sector general permit and stormwater pollution prevention plan or other permits or plans required by the EPA pursuant to the NPDES requirement. DEC requires copy of SWPPP from operator for both the construction general permit and the Multi Sector General Permit. Dewatering discharges can be covered under EPA's construction general permit and Multi Sector General Permit, if less than 250,000 gallons or greater than one mile from contaminated site and is not otherwise contaminated.
Water Quality – Wetlands, Lakes & Streams	US Army Corps of Engineers	Any activity in wetlands, lakes, and streams requires Corps permit.
Water Quality – Groundwater	EPA/DEC	There is no prohibition on creation of man-made lakes or dredging into the water table. Any dredging taking place into water table must be conducted in compliance with EPA notice of intent for the Multi-sector General Permit or NPDES requirements, and EPA and DEC requirements for storage, spills and disposal of oil, antifreeze and hydrocarbons. Creation of man-made waterbody may require Corps permit.
Water Quality – Dewatering	DEC	For dewatering that exceeds 250,000 gallons and is within a mile of a DEC-listed contaminated site.
Water Quantity – Dewatering	DNR	Water Use Permit may be required.
Air Quality Control	EPA DEC	EPA Air Quality Control Permit required for asphalt plant and crushers. DEC has dust control regulations; no permits are required.
Burning	ADNR DEC	Combustibles must be stockpiled separate from non-combustibles. Burning permit required from ADNR. Burning must be conducted in compliance with DEC air quality standards.
Hazardous Materials	EPA	Use of hazardous material regulated by EPA standards.
Oil, Antifreeze &	DEC	Regulated by DEC Oil and Hazardous Substances Pollution

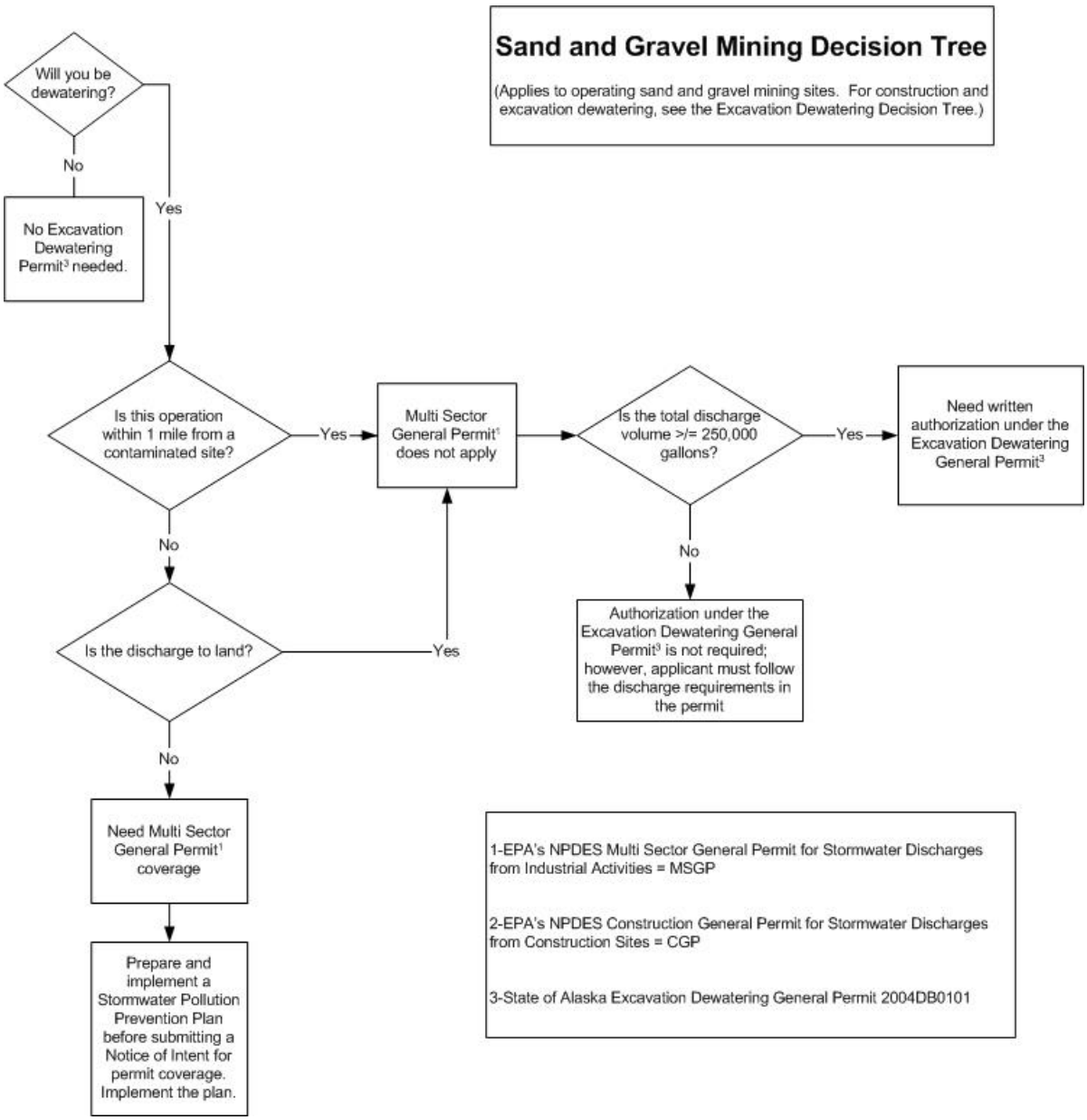
Issue	Responsible Agency	Agency Requirement
Hydrocarbon Storage (<1,200 gal.), Spills & Disposal		Control Regulation (18 AAC 75).
Oil, Antifreeze & Hydrocarbon Storage (>1,200 gal.), Spills & Disposal	EPA	Regulated by EPA standards.
Explosives – Storage and Use	FBATFE	Regulated by FBATFE.

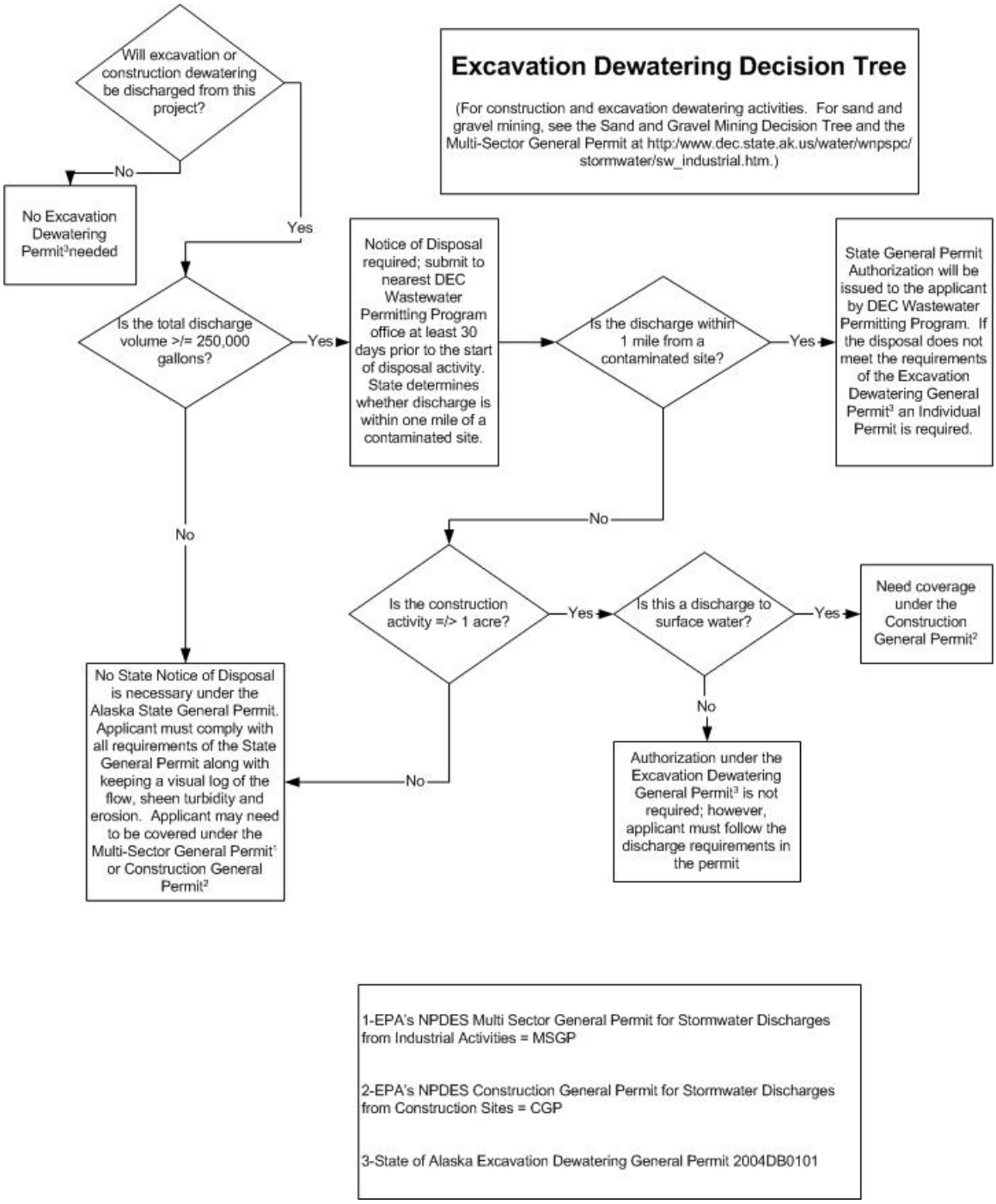
Revised - January 2006.

Key:

ADNR = Alaska Department of Natural Resources
DEC = Alaska Department of Environmental Conservation
EPA = United States Environmental Protection Agency
NPDES = National Pollutant Discharge Elimination System
FBATFE = Federal Bureau of Alcohol, Tobacco, Firearms & Explosives

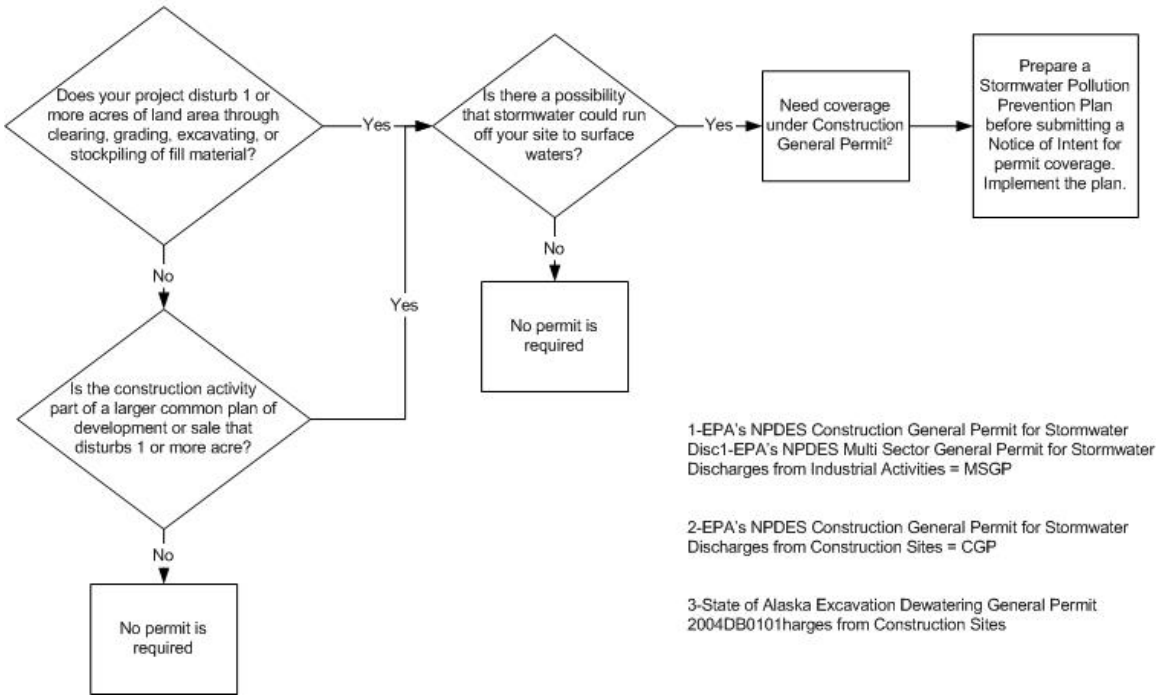
DEC Permit Decision Trees




Excavation Dewatering Decision Tree
(For construction and excavation dewatering activities. For sand and gravel mining, see the Sand and Gravel Mining Decision Tree and the Multi-Sector General Permit at http:/www.dec.state.ak.us/water/wnpspc/stormwater/sw_industrial.htm.)
Will excavation or construction dewatering be discharged from this project?
No
No Excavation Dewatering Permit[3] needed
Yes
Is the total discharge volume >/= 250,000 gallons?
Yes
Notice of Disposal required; submit to nearest DEC Wastewater Permitting Program office at least 30 days prior to the start of disposal activity. State determines whether discharge is within one mile of a contaminated site.
Is the discharge within 1 mile from a contaminated site?
Yes
State General Permit Authorization will be issued to the applicant by DEC Wastewater Permitting Program. If the disposal does not meet the requirements of the Excavation Dewatering General Permit[3] an Individual Permit is required.
No
No
Is the construction activity =/> 1 acre?
Yes
Is this a discharge to surface water?
Yes
Need coverage under the Construction General Permit[2]
No
No State Notice of Disposal is necessary under the Alaska State General Permit. Applicant must comply with all requirements of the State General Permit along with keeping a visual log of the flow, sheen turbidity and erosion. Applicant may need to be covered under the Multi-Sector General Permit[1] or Construction General Permit[2]
No
Authorization under the Excavation Dewatering General Permit[3] is not required; however, applicant must follow the discharge requirements in the permit
1-EPA's NPDES Multi Sector General Permit for Stormwater Discharges from Industrial Activities = MSGP
2-EPA's NPDES Construction General Permit for Stormwater Discharges from Construction Sites = CGP
3-State of Alaska Excavation Dewatering General Permit 2004DB0101

Construction General Permit Decision Tree

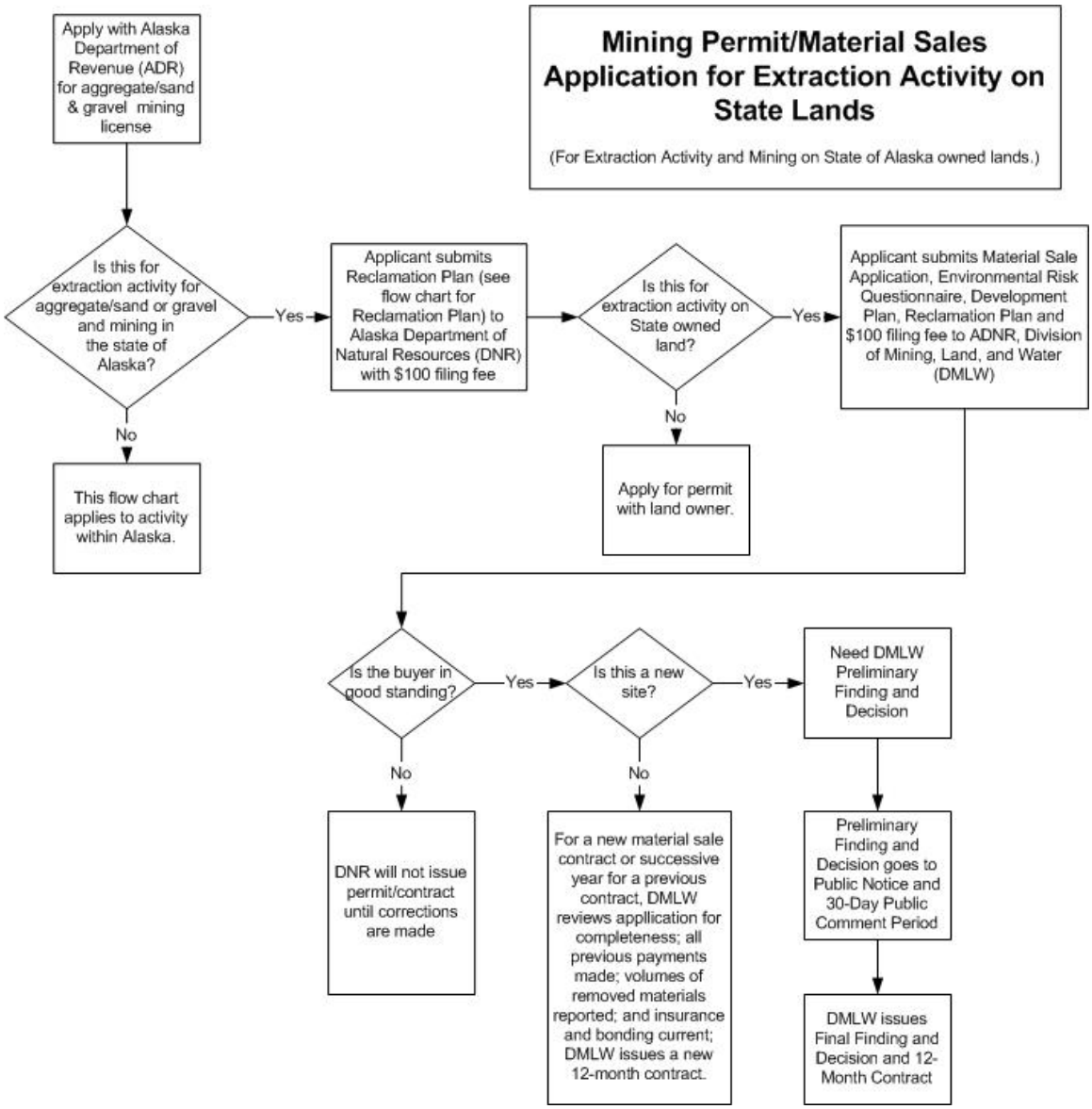
(For construction pollution prevention and control practices for storm water runoff during the construction period, resulting in the disturbance of one or more acres of land area.)

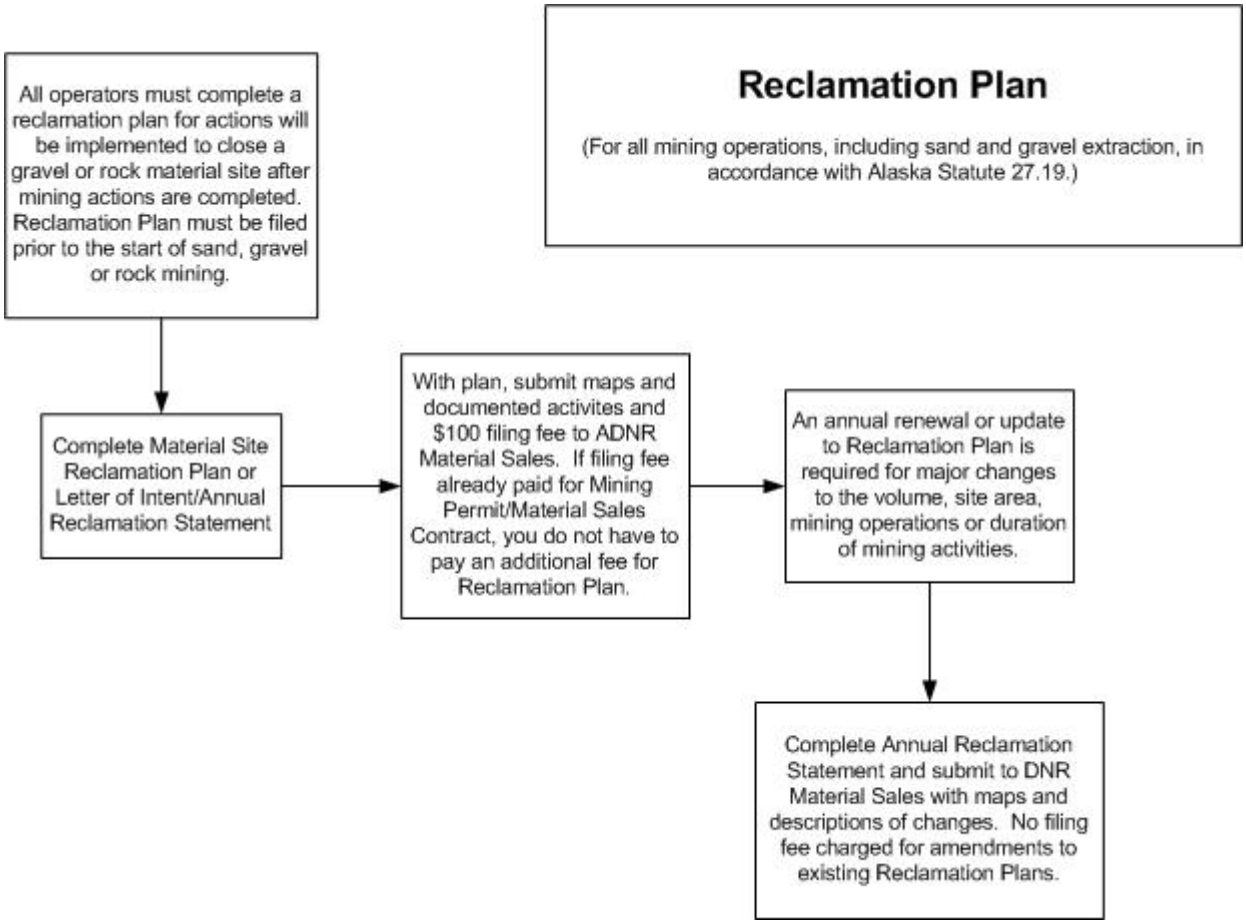


1-EPA's NPDES Construction General Permit for Stormwater Disc1-EPA's NPDES Multi Sector General Permit for Stormwater Discharges from Industrial Activities = MSGP

2-EPA's NPDES Construction General Permit for Stormwater Discharges from Construction Sites = CGP

3-State of Alaska Excavation Dewatering General Permit 2004DB0101harges from Construction Sites


Mining Permit/Material Sales Application for Extraction Activity on State Lands
(For Extraction Activity and Mining on State of Alaska owned lands.)
Apply with Alaska Department of Revenue (ADR) for aggregate/sand & gravel mining license
Is this for extraction activity for aggregate/sand or gravel and mining in the state of Alaska?
Yes
No
This flow chart applies to activity within Alaska.
Applicant submits Reclamation Plan (see flow chart for Reclamation Plan) to Alaska Department of Natural Resources (DNR) with $100 filing fee
Is this for extraction activity on State owned land?
Yes
No
Apply for permit with land owner.
Applicant submits Material Sale Application, Environmental Risk Questionnaire, Development Plan, Reclamation Plan and $100 filing fee to ADNR, Division of Mining, Land, and Water (DMLW)
Is the buyer in good standing?
Yes
No
DNR will not issue permit/contract until corrections are made
Is this a new site?
Yes
No
For a new material sale contract or successive year for a previous contract, DMLW reviews appllication for completeness; all previous payments made; volumes of removed materials reported; and insurance and bonding current; DMLW issues a new 12-month contract.
Need DMLW Preliminary Finding and Decision
Preliminary Finding and Decision goes to Public Notice and 30-Day Public Comment Period
DMLW issues Final Finding and Decision and 12-Month Contract


Reclamation Plan
(For all mining operations, including sand and gravel extraction, in accordance with Alaska Statute 27.19.)
All operators must complete a reclamation plan for actions will be implemented to close a gravel or rock material site after mining actions are completed. Reclamation Plan must be filed prior to the start of sand, gravel or rock mining.
Complete Material Site Reclamation Plan or Letter of Intent/Annual Reclamation Statement
With plan, submit maps and documented activites and $100 filing fee to ADNR Material Sales. If filing fee already paid for Mining Permit/Material Sales Contract, you do not have to pay an additional fee for Reclamation Plan.
An annual renewal or update to Reclamation Plan is required for major changes to the volume, site area, mining operations or duration of mining activities.
Complete Annual Reclamation Statement and submit to DNR Material Sales with maps and descriptions of changes. No filing fee charged for amendments to existing Reclamation Plans.

Appendix E – Best Management Practice Fact Sheets

This appendix presents nineteen fact sheets for Best Management Practices (BMPs). The BMPs have been selected for specific application in gravel pit operations in Alaska. There are, however, many "general reference" BMPs that can also be useful. Recommended websites include the following:

National Menu of Best Management Practices for Stormwater Phase II, United States Environmental Protection Agency, http://cfpub.epa.gov/npdes/stormwater/menuofbmps/menu.cfm, December 1999;

Water Related BMP's in the Landscape, Watershed Science Institute, http://www.abe.msstate.edu/csd/NRCS-BMPs/, October 2001;

Best Management Practices for Reclaiming Surface Mines in Washington and Oregon, http://www.dnr.wa.gov/geology/pdf/bmp.pdf [PDF, 7.6 Mb], June 2001; and

Stormwater Management Manual for Western Washington, Volumes 1-5 Washington State Department of Ecology, http://www.ecy.wa.gov/biblio/9911.html, June 2001.

Also see Appendix C– Resources for Information.