Small Business Economic Impact Analysis

Sand & Gravel General Permit

By

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For the

Water Quality Program

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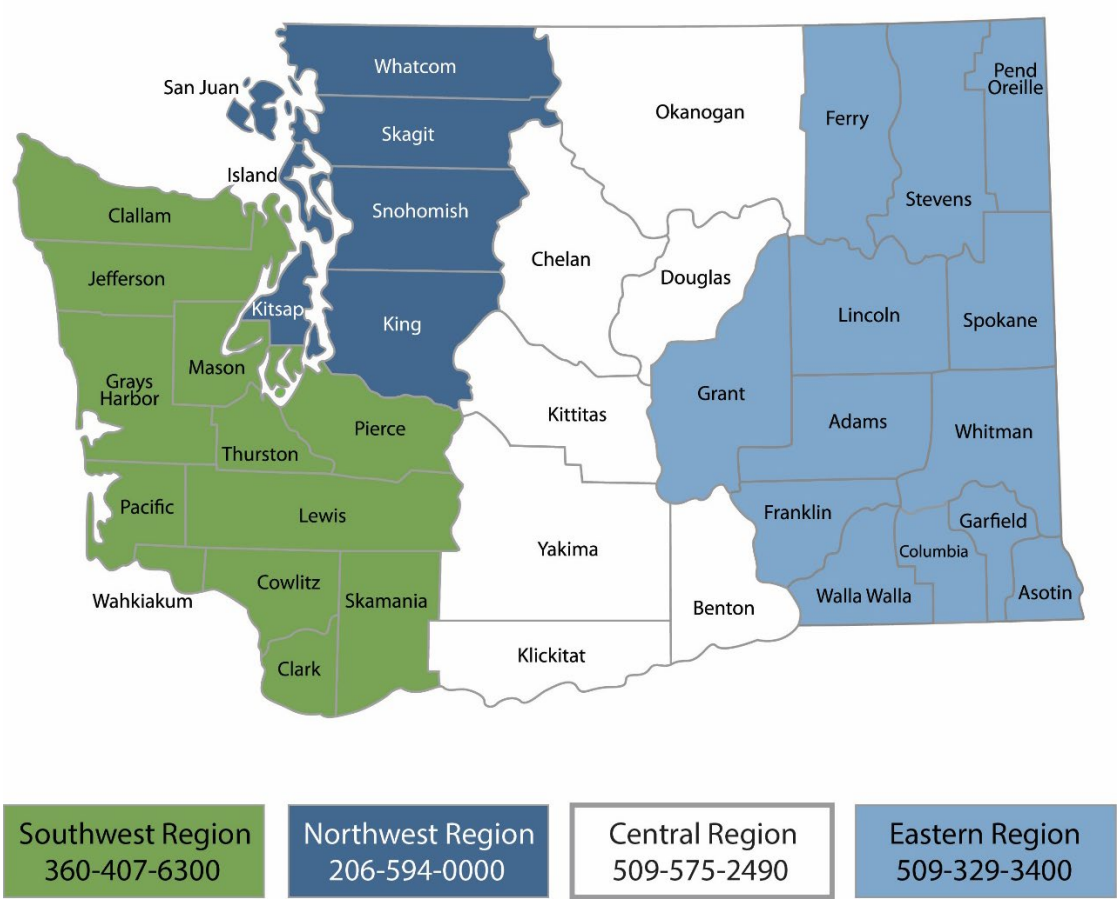

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Small Business Economic Impact Analysis

Sand & Gravel General Permit

National Pollutant Discharge Elimination System and State Waste Discharge General Permit

Water Quality Program
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DEPARTMENT OF
ECOLOGY
State of Washington

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Acronyms

- BMPs Best Management Practices
- CFR Code of Federal Regulations
- CWA Clean Water Act
- DMP Discharge Management Plan
- DMR Discharge Management Report
- DNR Department of Natural Resources
- EPA Environmental Protection Agency
- ESCP Erosion & Sediment Control Plan
- NAICS North American Industry Classification System
- NPDES National Pollutant Discharge Elimination System
- PARIS Permit and Reporting Information System
- PCT Pollution Control Technology
- RCW Revised Code of Washington
- SBEIA Small Business Economic Impact Analysis
- SWPPP Stormwater Pollution Prevention Plan
- TMDL Total Maximum Daily Load
- U.S.C. United States Code
- WAC Washington Administrative Code
- WSESD Washington State Employment Security Department

Executive Summary

This Small Business Economic Impact Analysis (SBEIA) estimates the costs of complying with the Sand & Gravel General Permit (permit). It compares the costs of complying with the permit for small businesses to the costs of compliance for the largest 10 percent of businesses, to determine whether the permit disproportionately impacts small businesses. This analysis is required by state rule in Washington Administrative Code (WAC) 173-226-120[2], which directs Ecology to determine if the permit imposes disproportionate burden on small businesses, and if it does, to mitigate the disproportion to the extent that is legal and feasible.

WAC 173-226-120 requires the SBEIA to include:

- A brief description of the compliance requirements of the general permit.
- The estimated costs of complying with the permit, based on existing data for businesses intended to be covered under the general permit, including:
    - The minimum technology-based treatment requirements identified as necessary under WAC 173-226-070.
    - The monitoring requirements contained in the general permit.
    - The reporting and recordkeeping requirements.
    - Plan submittal requirements.
    - Equipment.
    - Supplies.
    - Labor.
    - Increased administrative costs.
- A comparison, to the greatest extent possible, of the cost of compliance for small businesses with the cost of compliance for the largest ten percent of businesses intended to be covered under the permit.
- A summary of how the permit provides mitigation to reduce the effect on small businesses (if a disproportionate impact is expected), without compromising the mandated intent of the permit.

The Sand & Gravel General Permit (permit) regulates discharges of process water, stormwater, and mine dewatering water associated with:

- Sand and gravel operations.
- Concrete batch plants.
- Asphalt plants.

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[2] Chapter 173-226 WAC Waste Discharge General Permit Program
https://apps.leg.wa.gov/wac/default.aspx?cite=173-226

This includes rock quarries, and similar mining operations, including stockpiles of mined materials

The permit is required by federal and state water quality laws and controls the discharge of pollutants to protect surface water and ground water quality

This SBEIA only includes costs solely determined by the permit. This does not include the costs of complying with any existing laws and rules, as permittees would be required to comply with requirements regardless of whether the permit reiterated or referenced them, or if the permit did not exist.

The types and attributes of facilities that are covered by the general permit are diverse. We estimated the costs of compliance for seven representative facilities.

For each of the seven types of facilities (new and existing), we estimated the following costs of complying with the permit:

- Developing or updating plans.
- Implementing BMPs.
- Buying necessary equipment.
- Paying for operating.

Assumptions, inputs, and calculations are presented in Appendix A of this document. Estimates are in rounded thousands of current 2025-dollars.

Table i: Summary of annual equivalent compliance costs

Facility Type	Estimated Compliance Cost (thousands of $) New	Estimated Compliance Cost (thousands of $) New	Compliance Cost per Employee (dollars) New	Compliance Cost per Employee (dollars) Existing
Small, inactive sand and gravel pit	$3	$1,455	$1,455	$1,283
Small, active sand and gravel pit	$75	$7,481	$7,481	$3,246
Large, active sand and gravel pit	$127	$78	$78	$41
Small, active sand and gravel pit with concrete and recycling	$134	$22,254	$22,254	$13,541
Large, active sand and gravel pit with concrete and recycling	$217	$8	$8	$5
Small, active hot-mix asphalt facility	$36	$5,116	$5,116	$2,817
Large, active hot-mix asphalt facility	$75	$51	$51	$30

Comparing small and large facilities for each new or existing facility type, we find that **the general permit likely imposes disproportionate costs on small businesses**.

The governing rule states the following options should be considered to reduce the impact of the permit on small businesses.

- Establishing differing compliance or reporting requirements or timetables for small businesses.
- Clarifying, consolidating, or simplifying the compliance and reporting requirements under the general permit for small businesses.
- Establishing performance rather than design standards.
- Exempting small businesses from parts of the general permit.

Ecology has taken the following actions to mitigate the compliance cost impact of the permit on small business.

- Inactive sites have fewer permit requirements.
- Fee reduction for non-operating facilities.
- Sliding fee for asphalt and concrete facilities.
- Small business/extreme hardship fee reductions.

In general, however, the permit's impact on facilities of any size is difficult to legally and feasibly mitigate because more significant mitigation is not possible without reducing the effectiveness of the permit that regulates the discharge of pollutants to protect surface water and ground water quality, per the stated objectives of the Clean Water Act and chapter 90.48 RCW (the State Water Pollution Control Act).

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Chapter 1: Introduction to the Small Business Economic Impact Analysis

This Small Business Economic Impact Analysis (SBEIA) estimates the costs of complying with the Sand & Gravel General Permit (permit). It compares the costs of complying with the permit for small businesses to the costs of compliance for the largest 10 percent of businesses, to determine whether the permit disproportionately impacts small businesses. This analysis is required by state rule in Washington Administrative Code (WAC) 173-226-120[3], which directs Ecology to determine if the permit imposes disproportionate burden on small businesses, and if it does, to mitigate the disproportion to the extent that is legal and feasible.

1.1 Scope

WAC 173-226-120 requires the SBEIA to include:

- A brief description of the compliance requirements of the general permit.
- The estimated costs of complying with the permit, based on existing data for businesses intended to be covered under the general permit, including:
    - The minimum technology-based treatment requirements identified as necessary under WAC 173-226-070.
    - The monitoring requirements contained in the general permit.
    - The reporting and recordkeeping requirements.
    - Plan submittal requirements.
    - Equipment.
    - Supplies.
    - Labor.
    - Increased administrative costs.
- A comparison, to the greatest extent possible, of the cost of compliance for small businesses with the cost of compliance for the largest ten percent of businesses intended to be covered under the permit.
- A summary of how the permit provides mitigation to reduce the effect on small businesses (if a disproportionate impact is expected), without compromising the mandated intent of the permit.

[3] Chapter 173-226 WAC Waste Discharge General Permit Program
https://apps.leg.wa.gov/wac/default.aspx?cite=173-226

1.2 Definitions of small and large businesses

For the purposes of the SBEIA, a small business is an independent entity with 50 or fewer employees. Government enterprises are excluded. Employment is typically based on the highest available level of ownership data.

1.3 Permit Coverage

The Sand & Gravel General Permit (permit) regulates discharges of process water, stormwater, and mine dewatering water associated with:

- Sand and gravel operations.
- Concrete batch plants.
- Asphalt plants.

This includes rock quarries, and similar mining operations, including stockpiles of mined materials

The permit is required by federal and state water quality laws and controls the discharge of pollutants to protect surface water and ground water quality

There are nearly 900 Sand & Gravel facilities across Washington State. Approximately 90 percent of these facilities discharge to groundwater only, while roughly ten percent of the permittees have a surface water discharge.

Mining-related activities can include:

- Excavating
- Screening
- Washing rock
- Crushing
- Blasting
- Manufacturing asphalt
- Manufacturing concrete

When rain hits Sand & Gravel facilities, it can pick up a variety of pollutants such as oil, soil, sand, and concrete dust. These pollutants can cause water quality problems by altering pH and water clarity. This, in turn, can cause problems for aquatic animals and plants, pollute drinking water, and impair recreation.

1.4 Excluded costs

This SBEIA only includes costs solely determined by the permit. This does not include the costs of complying with any existing laws and rules, as permittees would be required to comply with requirements regardless of whether the permit reiterated or referenced them, or if the permit did not exist. Costs excluded from all SBEIAs include the costs of complying with:

- Water Quality Standards for Surface Waters of the State of Washington (Chapter 173-201A WAC)
- Ground Water Quality Standards (Chapter 173-200 WAC)
- Sediment Management Standards (Chapter 173-204 WAC)
- Wastewater discharge permit fees (WAC 173-224).
- Federal laws and rules, including but not limited to the Clean Water Act and federal National Pollutant Discharge Elimination System (NPDES) regulations if discharging to surface waters.

Discharges not in compliance with the above standards are not authorized, regardless of whether or not the proposed general permit exists. The above standards represent the baseline in the analysis, the state of the world if the permit did not exist. We consider the impacts of the permit on permittees in comparison to this baseline.

1.5 Compliance costs included in the SBEIA

According to WAC 173-226-120, the SBEIA must estimate the costs of the following:

- The minimum technology based treatment requirements identified as necessary under WAC 173-226-070.
- The monitoring requirements contained in the general permit.
- The reporting and recordkeeping requirements.
- Any plan submittal requirements.
- The costs of equipment, supplies, labor, and any increased administrative costs.

The permit requires facilities to control and reduce wastewater pollution. This includes developing and using a specific site management plan. The site management plan must contain four main components:

1. Erosion & Sediment Control Plan (ESCP)
2. Monitoring Plan
3. Stormwater Pollution Prevention Plan (SWPPP)
4. Spill Control Plan

1.5.1 Erosion & Sediment Control Plan (ESCP)

Excessive turbidity is often a major stormwater/process water contaminate at many Sand & Gravel facilities. The permit requires permittees to prepare an ESCP before conducting any earth moving activities. Permittees must develop this plan to select, install, and maintain appropriate erosion and sediment control best management practices (BMPs). Such BMPs include sediment ponds, perimeter dikes, and sediment barriers.

1.5.2 Monitoring Plan

Each facility must monitor their discharges of process water and stormwater according to the effluent limits and monitoring requirements in the permit. Additionally, discharges must not cause or contribute to a violation of:

- Groundwater Quality Standards.
- Surface Water Quality Standards.
- Sediment Management Standards.

1.5.3 Stormwater Pollution Prevention Plan (SWPPP)

Each facility must create and regularly update a SWPPP. The objectives of the SWPPP include:

- Eliminating the commingling of process water and stormwater.
- Implementing runoff conveyance, treatment, innovative, and source control BMPs.
- Preventing stormwater contamination.

The permit provides specific source control BMPs that Ecology has determined to be appropriate for most Sand & Gravel facilities covered under the permit. Sand & Gravel facilities must evaluate these specific source control BMPs, include them in their SWPPP, and implement them on site if appropriate.

1.5.4 Spill Control Plan

It is typical for facilities, covered under this permit, to store chemicals that have the potential to cause water pollution if accidentally released. Additionally, spills can occur from the use of mechanical equipment and vehicles. The permit requires permittees to develop a plan to prevent, report, and minimize the damage from any spill that may occur.

Chapter 2: Costs of Compliance with the General Permit

This Small Business Economic Impact Analysis (SBEIA) estimates the costs of complying with the Sand & Gravel general permit. It also compares the costs of complying with the general permit for small businesses to the costs of compliance for large businesses, to determine whether the requirements of the general permit disproportionately impact small businesses.

The types and attributes of facilities that are covered by the general permit are diverse. We estimated the costs of compliance for seven representative facilities:

1. Small, inactive sand and gravel pit
2. Small, active sand and gravel pit
3. Large, active sand and gravel pit
4. Small, active sand and gravel pit with concrete and recycling
5. Large, active sand and gravel pit with concrete and recycling
6. Small, active hot-mix asphalt facility
7. Large, active hot-mix asphalt facility

For each of the seven types of facilities (new and existing), we estimated the following costs of complying with the permit:

- Developing or updating plans.
- Implementing BMPs.
- Buying necessary equipment.
- Paying for operating.

The specific assumptions we made about compliance behaviors for each new and existing type of facility can be found in Appendix A of this document, including assumptions used in making estimates of capital costs. It is necessary to annualize costs because some costs are annual (incurred every year), while other costs are capital costs (incurred once). For example, equipment for pH testing is a one-time capital cost, while monitoring is an annual cost that must be incurred every year. By annualizing costs, we allow for direct comparison.

The scope of the analysis includes only the direct compliance costs imposed by the general permit to the expected permittees. We are not required to evaluate benefits in an SBEIA and do not do so in this document.

2.1 Data used in this analysis

We used various data sources, as appropriate, for this analysis:

- We based quantities and attributes of compliance inputs (equipment, hours, operating inputs, maintenance) on:
    - Past industry and DOT estimates.

    - Ecology inspector professional experience.
    - Specific requirements in the permit.

- We based compliance input unit costs on:
    - Updated past industry and DOT estimates.
    - Current retail prices.
    - Current wages (overhead as appropriate).
    - Current lab test rates.
    - Ten percent interest rates for annualized capital cost repayments.

For the sources of the specific data we used in this analysis, see Appendix and References.

2.2 Scope of time

Ecology's economic analyses typically make estimates based on either a 20-year timeframe or the expected life of the regulation in question. In the case of a general permits, the expected life is five years. However, many of the compliance costs analyzed for general permits involve capital purchases. We therefore chose to estimate annualized costs, to account for the cost of repaying up-front capital costs such as machinery and built capital over the life of the investment. All reported total costs of compliance are annual equivalents.

2.3 Summary of compliance costs

We estimated compliance costs for each of the seven types of representative facilities. Assumptions, inputs, and calculations are presented in Appendix A of this document. Estimates are in rounded thousands of current 2025-dollars.

Table 2: Summary of annual equivalent compliance costs

Facility Type	Estimated Compliance Cost (thousands of $) New	Estimated Compliance Cost (thousands of $) Existing
Small, inactive sand and gravel pit	$3	$3
Small, active sand and gravel pit	$75	$32
Large, active sand and gravel pit	$127	$66
Small, active sand and gravel pit with concrete and recycling	$134	$81
Large, active sand and gravel pit with concrete and recycling	$217	$132
Small, active hot-mix asphalt facility	$36	$20
Large, active hot-mix asphalt facility	$75	$44

Chapter 3: Relative Compliance Costs for Small and Large Businesses

This chapter compares the costs of compliance per employee for small businesses to the compliance cost per employee at the largest ten percent of businesses covered by the permit. The governing rule (WAC 173-226-120) allows for this comparison to be made on one of the following bases:

- Cost per employee.
- Cost per hour of labor.
- Cost per one hundred dollars of sales.

We use cost per employee, because this data is readily and most comprehensively available for businesses operating in Washington State.

3.1 Business size data

Facility size distribution was determined for the following NAICS codes:

- NAICS 21232X – Sand, Gravel, Clay, and Ceramic and Refractory Minerals Mining and Quarrying (includes all 6-digit NAICS categories under this group).
- NAICS 32412X – Asphalt Paving, Roofing, and Saturated Materials Manufacturing(includes all 6-digit NAICS categories under this group).
- NAICS 3273XX - Cement and Concrete Product Manufacturing (includes all 6-digit NAICS categories under this group)

Table 2 lists the average number of employees for the small businesses (less than 50 employees) and the largest 10% of businesses in each of the representative industries.[4]

Table 3: Average employment estimates by sector

Type of facility	Number of employees
Inactive small facility	2
Active small facilities in NAICS 21232X	10
Active largest ten percent of facilities in NAICS 21232X	1,633
Active small facilities in NAICS 32412X	7
Active largest ten percent of facilities in NAICS 32412X	1,460
Active small facilities in NAICS 3273XX	6
Active largest ten percent of facilities in NAICS 3273XX	27,167

[4] Employment data for potentially impacted entities comes from Ecology's third-party database of employers with locations in Washington State.

There was no overlap between small facilities and the largest ten percent of all facilities.

3.2 Relative costs of compliance

This SBEIA compares the costs of compliance for small and large businesses to determine if the general permit disproportionately impacts small businesses. Ecology compares costs by looking at the cost per employee, where businesses with fewer than 50 employees are considered small businesses.

The table below summarizes the cost of compliance per employee at the seven types of representative facility.

Table 4: Relative costs of compliance

Facility Type	NAICS	Compliance Cost per Employee (dollars): New	Compliance Cost per Employee (dollars): Existing
Small, inactive sand and gravel pit	21232	$1,455	$1,283
Small, active sand and gravel pit	21232	$7,481	$3,246
Large, active sand and gravel pit	21232	$78	$41
Small, active sand and gravel pit with concrete and recycling	3273	$22,254	$13,541
Large, active sand and gravel pit with concrete and recycling	3273	$8	$5
Small, active hot-mix asphalt facility	32412X	$5,116	$2,817
Large, active hot-mix asphalt facility	32412X	$51	$30

Comparing small and large facilities for each new or existing facility type, we find that **the general permit likely imposes disproportionate costs on small businesses**.

Chapter 4: Mitigation of Disproportionate Impacts

The general permit likely imposes disproportionate costs on small businesses, so Ecology took the legal and feasible actions described in this chapter to reduce small business compliance burden.

4.1 Mitigation options under WAC 173-226-120

The governing rule states the following options should be considered to reduce the impact of the permit on small businesses.

- Establishing differing compliance or reporting requirements or timetables for small businesses.
- Clarifying, consolidating, or simplifying the compliance and reporting requirements under the general permit for small businesses.
- Establishing performance rather than design standards.
- Exempting small businesses from parts of the general permit.

4.2 Mitigation actions

Ecology has taken the following actions to mitigate the compliance cost impact of the permit on small business.

- Inactive sites have fewer permit requirements.
- Fee reduction for non-operating facilities.
- Sliding fee for asphalt and concrete facilities.
- Small business/extreme hardship fee reductions.

In general, however, the permit's impact on facilities of any size is difficult to legally and feasibly mitigate because more significant mitigation is not possible without reducing the effectiveness of the permit that regulates the discharge of pollutants to protect surface water and ground water quality, per the stated objectives of the Clean Water Act and chapter 90.48 RCW (the State Water Pollution Control Act).

4.2.1 Fewer permit requirements at inactive sites

Inactive sites have fewer permit requirements. If they have no excavation or mining (are inactive), and no process water or mine dewatering discharge, they are not required to:

- Monitor stormwater.
- Inspect wet and dry erosion and sediment.
- Inspect equipment inspections.

4.2.2 Fee reduction for non-operating sites

For sites that operate less than 90 days in a calendar year, fees are reduced.

4.2.3 Sliding fee for asphalt and concrete facilities

Fees for concrete and asphalt facilities use a sliding scale based on production amounts.

4.2.4 Small business/extreme hardship fee reductions

A business may apply for a small business fee reduction if it meets the following criteria:

1. Be a corporation, partnership, sole proprietorship, or other legal entity formed for the purpose of making a profit;
2. Be independently owned and operated from all other businesses (that is, not a subsidiary of a parent company);
3. Have annual sales of one million ($1,000,000.00) dollars or less of the goods and services produced using the processes regulated by the wastewater discharge permit; and
4. Pay an annual wastewater discharge permit fee greater than five hundred ($500.00) dollars.

4.3 Conclusion

This analysis found that the Sand and Gravel General Permit likely imposes disproportionate costs on small versus large businesses complying with it. In compliance with WAC 173-226-120, Ecology included elements in the general permit that reduce compliance costs, and attempted to reduce disproportionate costs. Further cost reductions, or reductions to disproportion, were not possible due to limitations of federal and state laws and rules protecting the environment and regulating permittee behavior.

Appendix A: Compliance Cost Assumptions, Inputs, and Calculations

A.1: Small, inactive sand and gravel pit – new

Assumptions:

- Five acre site.
- No process water discharge.
- No mine dewatering discharge.
- No discharge to surface waters.
- No equipment operations.
- Stabilization BMPs focus on eliminating exposed soils that are exposed to stormwater.
- Five acres of disturbed area needs erosion control measures.
- No structural BMPs needed for Inactive Sites.
- Every three years a registered professional engineer must certify that the site is in compliance with permit conditions.
- Must report DMRs every quarter.

Table A- 1 Compliance costs for small inactive sand & gravel pit -- new

ITEM	QUANTITY	UNITS	UNIT COST	COST	USEFUL LIFE (YEARS)	ANNUALIZED COST	ANNUAL O&M COST	TOTAL ANNUAL COST
Site Management Plan (SMP): Write SMP	18	Hours	$82	$1,467	5	$387	n/a	$387
Site Management Plan (SMP): Initial Site Stabilization – Stabilization BMPs	40	Hours	$22	$863	10	$140	n/a	140
Site Management Plan (SMP): Heavy Equipment – Stabilization BMPs	40	Hours	$39	$1,554	10	$253	n/a	253
Site Management Plan (SMP): Heavy Equipment Mobilization - Stabilization BMPs	4	Hours	$54	$216	10	$35	n/a	35

ITEM	QUANTITY	UNITS	UNIT COST	COST	USEFUL LIFE (YEARS)	ANNUALIZED COST	ANNUAL O&M COST	TOTAL ANNUAL COST
Site Management Plan (SMP): Hydromulching – Stabilization BMPs	5	Acres	$2,158	$10,789	10	$1,756	n/a	1,756
Activities: Certification of Permit Compliance	6	Hours	$82	$489	3		197	197
Activities: DMR Submission	4	hours	$35	$141	1	$141		141
TOTAL	n/a	n/a	n/a	n/a	n/a	n/a	n/a	**$2,909**

A.2 Small, inactive sand and gravel pit – existing

Assumptions:

- Five acre site.
- No process water discharge.
- No mine dewatering discharge.
- No discharge to surface waters.
- No equipment operations.
- Stabilization BMPs focus on eliminating exposed soils that are exposed to stormwater.
- Five acres of disturbed area needs erosion control measures.
- No structural BMPs needed for Inactive Sites.
- Must report DMRs every quarter.
- Every three years a registered professional engineer must certify that the site is in compliance with permit conditions.

Table A- 2 Compliance costs for small inactive sand & gravel pit -- existing

ITEM	QUANTITY	UNITS	UNIT COST	COST	USEFUL LIFE (YEARS)	ANNUALIZED COST	ANNUAL O&M COST	TOTAL ANNUAL COST
Site Management Plan (SMP): Write SMP	2	Hours	$82	$163	5	$43	n/a	$43
Site Management Plan (SMP): Initial Site Stabilization – Stabilization BMPs	40	Hours	$22	$863	10	$140	n/a	140

ITEM	QUANTITY	UNITS	UNIT COST	COST	USEFUL LIFE (YEARS)	ANNUALIZED COST	ANNUAL O&M COST	TOTAL ANNUAL COST
Site Management Plan (SMP): Heavy Equipment – Stabilization BMPs	40	Hours	$39	$1,554	10	$253	n/a	253
Site Management Plan (SMP): Heavy Equipment Mobilization - Stabilization BMPs	4	Hours	$54	$216	10	$35	n/a	35
Site Management Plan (SMP): Hydromulching – Stabilization BMPs	5	Acres	$2,158	$10,789	10	$1,756	n/a	1,756
Activities: Certification of Permit Compliance	6	Hours	$82	$489	3		197	197
Activities: DMR Submission	4	hours	$35	$141	1	$141	n/a	141
TOTAL	n/a	n/a	n/a	n/a	n/a	n/a	n/a	**$2,565**

A.3 Small, active sand and gravel pit – new

Assumptions:

- Three acres of disturbed area.
- Discharge to groundwater (no surface water discharge).
- 78 ft. X 85 ft. unlined wet pond. Depth 4-5 ft. with a 4:1 slope.
- Process wastewater is pretreated by a 200 foot, grass-lined biofiltration swale. Need one such swale per three acres of disturbed area.
- SMP includes site map. Plan must be reviewed and updated yearly.
- Includes wet, dry, visual inspections.
- Vehicle/equipment inspections are conducted by drivers
- Assume groundwater discharge – Erosion & Sediment Control inspections aren't required. Erosion and sediment control BMPs must be inspected once a week.
- Must compile inspection results.
- No commingling of process water and stormwater.

- All Type 3 stormwater is treated by a 200 foot, grass-lined biofiltration swale. Need one such swale per three acres of disturbed area.
- Swale installed after hydromulching of exposed areas.
- Drum spill containment with pallet.
- Mechanical push broom sweeper
- Stabilization BMPs focus on eliminating exposed soils that are exposed to stormwater. Five acres of disturbed area needs erosion control measures.
- One monitoring sample point assumed. Monitoring four quarters per year.
- Copies of all monitoring reports, laboratory data, and quality assurance and control documentation must be retained for three to five years. The cost of complying with these requirements is the cost of storing records. This cost is either very low or zero.
- Daily monitoring when discharge occurs. Discharge occurs daily. Six-day work week.
- Must report DMRs every quarter.

Table A- 3 Compliance costs for small active sand & gravel pit – new (process wastewater management)

ITEM	QUANTITY	UNITS	UNIT COST	COST	USEFUL LIFE (YEARS)	ANNUALIZED COST	ANNUAL O&M COST	TOTAL ANNUAL COST
Process Wastewater Management (Wet Pond)**:** Grader	8	Hours	$39	$311	10	$51	n/a	$51
Process Wastewater Management (Wet Pond)**:** Front-End Loader	8	Hours	$39	311	10	$51	n/a	51
Process Wastewater Management (Wet Pond)**:** Labor	32	Hours	$31	981	10	$160	n/a	160
Process Wastewater Management (Wet Pond)**:** Heavy Equipment Mobilization	12	Hours	$54	647	10	$105	n/a	105
Process Wastewater Management (Biofiltration Swale): Grader, 4 Foot Wide	8	Hours	$39	311	10	$51	n/a	51
Process Wastewater Management (Biofiltration Swale): Support Vehicle	8	Hours	$54	432	10	$70	n/a	70
Process Wastewater Management (Biofiltration Swale): Labor	8	Hours	$31	245	10	$40	n/a	40
Process Wastewater Management (Biofiltration Swale): Supervision	2	Hours	$35	71	10	$11	n/a	11

ITEM	QUANTITY	UNITS	UNIT COST	COST	USEFUL LIFE (YEARS)	ANNUALIZED COST	ANNUAL O&M COST	TOTAL ANNUAL COST
Process Wastewater Management (Biofiltration Swale): Hydromulching Of Swale	1	Unit	$539	539	10	$88	n/a	88
Process Wastewater Management (Biofiltration Swale And Pond O & M): Mower	3	Hours	$43	129	1	n/a	129	129
Process Wastewater Management (Biofiltration Swale And Pond O & M): Support Vehicle	4	Hours	$54	216	1	n/a	216	216
Process Wastewater Management (Biofiltration Swale And Pond O & M): Labor	4	Hours	$31	123	1	n/a	123	123
Site Management Plan : Write Smp	40	Hours	$82	3,261	1	$3,261		3,261
Inspections: Labor	8	Hours	$31	245	1	n/a	245	245
Inspections: Write Insp. Rpt.--Labor	2	Hours	$31	61	1	n/a	61	61
Inspections: Write Insp. Rpt.--Supervision	2	Hours	$35	71	1	n/a	71	71
Inspections: Vehicle / Equipment Inspections	225	Hours	$31	6,899	1	n/a	6,899	6,899
Inspections: Sediment / Erosion Control Inspections	0	Hours	$31	0	1	n/a	0	0
Inspections: Recordkeeping	0	Hours	$0	0	0	n/a	0	0
Stormwater Pollution Prevention: Perimeter Berm And Resloping	86	Hours	$194	16,702	10	$2,718	n/a	2,718
Stormwater Pollution Prevention (Biofiltration Swale)**:** Grader, 4 Foot Wide	8	Hours	$39	311	10	$51	n/a	51
Stormwater Pollution Prevention (Biofiltration Swale)**:** Support Vehicle	8	Hours	$54	432	10	$70	n/a	70
Stormwater Pollution Prevention (Biofiltration Swale)**:** Labor	8	Hours	$31	245	10	$40	n/a	40
Stormwater Pollution Prevention (Biofiltration Swale)**:** Supervision	2	Hours	$35	71	10	$11	n/a	11
Stormwater Pollution Prevention (Biofiltration Swale)**:** Hydromulching Of Swale	1	Unit	$539	539	10	$88	n/a	88

ITEM	QUANTITY	UNITS	UNIT COST	COST	USEFUL LIFE (YEARS)	ANNUALIZED COST	ANNUAL O&M COST	TOTAL ANNUAL COST
Stormwater Pollution Prevention: Mechanical Sweeper	1	Unit	$220,084	220,084	10	$35,818	n/a	35,818
Stormwater Pollution Prevention (Biofiltration Swale O & M): Mower	3	Hours	$43	129	1	n/a	129	129
Stormwater Pollution Prevention (Biofiltration Swale O & M): Support Vehicle	4	Hours	$54	216	1	n/a	216	216
Stormwater Pollution Prevention (Biofiltration Swale O & M): Labor	4	Hours	$31	123	1	n/a	123	123
Stormwater Pollution Prevention (Biofiltration Swale O & M): Spill Kit	1	Kit	$615	615	1	n/a	615	615
Stormwater Pollution Prevention (Biofiltration Swale O & M): Secondary Containment	1	Unit	$710	710	1	n/a	710	710
Stormwater Pollution Prevention (Biofiltration Swale O & M): Street Sweeping	90	Hours	$31	2,759	1	n/a	2,759	2,759
Erosion And Sediment Control (Stabilization Bmps)**:** Initial Site Stabilization	40	Hours	$16	644	5	$170	n/a	170
Erosion And Sediment Control (Stabilization Bmps)**:** Heavy Equipment	40	Hours	$29	1,159	5	$306	n/a	306
Erosion And Sediment Control (Stabilization Bmps)**:** Heavy Equipment Mobilization	4	Hours	$40	161	5	$42	n/a	42
Erosion And Sediment Control (Stabilization Bmps)**:** Hydromulching Of Exposed Areas	0.50	Acres	$1,610	805	5	$212	n/a	212
Monitoring: Process Water Monitoring	1	Smpl. Pts.	$9,764	9,764	1	n/a	9,764	$9,764
Monitoring: Stormwater Monitoring	1	Smpl. Pts.	$9,198	9,198	1	n/a	9,198	$9,198
Monitoring: Recordkeeping	0	n/a	$0	0	0	n/a	0	0
Monitoring: Dmr Submission	4	hours	$35	141	1	$141	n/a	$141
TOTAL	n/a	n/a	n/a	n/a	n/a	n/a	n/a	**$74,812**

Table A- 4 Effluent monitoring costs for small active sand & gravel pit

Type of Discharge	Pollutant	Cost Per Test	Sampling Labor Cost	Freq.	Freq Units	Total Cost
NAICS 212321 Process Water to Ground	Oil Sheen	0	30.66	300	Yearly	$9,198
NAICS 212321 Process Water to Ground	TDS	$16.50	30.66	12	Yearly	$566
Total Cost for NAICS 212321 Process Water to Ground	n/a	n/a	n/a	n/a	n/a	$9,764
NAICS 212321 Stormwater to Ground	Oil Sheen	0	30.66	300	Yearly	$9,198
Total Cost for NAICS 212321 Stormwater to Ground	n/a	n/a	n/a	n/a	n/a	$9,198
Highest Annual Cost	**n/a**	**n/a**	**n/a**	**n/a**	**n/a**	**$18,962**

A.4 Small, active sand and gravel pit – existing

Assumptions:

- Three acres of disturbed area.
- Discharge to groundwater (no surface water discharge).
- SMP includes site map. Plan must be reviewed yearly, and updated as necessary.
- Includes wet, dry, visual inspections.
- Vehicle/equipment inspections conducted by drivers
- Assume groundwater discharge – Erosion & Sediment Control inspections aren't required. Erosion and sediment control BMPs must be inspected once a week.
- Must write a report on each inspection.
- Drum spill containment with pallet.
- Mechanical pushbroom sweeper.
- Stabilization BMPs focus on eliminating exposed soils that are exposed to stormwater. Five acres of disturbed area needs erosion control measures.
- One monitoring sample points assumed. Monitoring 4 quarters per year.
- Copies of all monitoring reports, laboratory data, and quality assurance and control documentation must be retained for three to five years. The cost of complying with these requirements is the cost of storing records. This cost is either very low or zero.
- Daily monitoring when discharge occurs. Discharge occurs daily. Six-day work week.

- Must report DMRs every quarter.

Table A- 5 Compliance costs for small active sand & gravel pit -- existing

ITEM	QUANTITY	UNITS	UNIT COST	COST	USEFUL LIFE (YEARS)	ANNUALIZED COST	ANNUAL O&M COST	TOTAL ANNUAL COST
Biofiltration Swale and Pond O & M: Mower	3	Hours	43	129	1	n/a	129	129
Biofiltration Swale and Pond O & M: Support Vehicle	4	Hours	54	216	1	n/a	216	216
Biofiltration Swale and Pond O & M: Labor	4	Hours	31	123	1	n/a	123	123
Site Management Plan: Update SMP	4	Hours	82	326	1	$326		326
Inspections: Labor	8	Hours	31	245	1	n/a	245	245
Inspections: Write Insp. Rpt.--Labor	2	Hours	31	61	1	n/a	61	61
Inspections: Write Insp. Rpt.--Supervision	2	Hours	35	71	1	n/a	71	71
Inspections: Vehicle / Equipment Inspections	225	Hours	31	6,899	1	n/a	6,899	6,899
Inspections: Sediment / Erosion Control Inpsections	0	Hours	31	0	1	n/a	0	0
Inspections: Recordkeeping	0	Hours	0	0	0	n/a	0	0
Biofiltration Swale O & M: Mower	3	Hours	43	129	1	n/a	129	129
Biofiltration Swale O & M: Support Vehicle	4	Hours	54	216	1	n/a	216	216
Biofiltration Swale O & M: Labor	4	Hours	31	123	1	n/a	123	123
Biofiltration Swale O & M: Spill Kit	1	Kit	615	615	1	n/a	615	615
Biofiltration Swale O & M: Secondary Containment	1	Unit	710	710	1	n/a	710	710
Biofiltration Swale O & M: Street Sweeping	90	Hours	31	2,759	1	n/a	2,759	2,759
Erosion And Sediment Control: Initial Site Stabilization	40	Hours	16	644	5	$170	0	170
Erosion And Sediment Control: Heavy Equipment	40	Hours	29	1,159	5	$306	0	306

ITEM	QUANTITY	UNITS	UNIT COST	COST	USEFUL LIFE (YEARS)	ANNUALIZED COST	ANNUAL O&M COST	TOTAL ANNUAL COST
Erosion And Sediment Control: Heavy Equipment Mobilization	4	Hours	40	161	5	$42	0	42
Erosion And Sediment Control: Hydromulching Of Exposed Areas	0.50	Acres	1,610	805	5	$212	0	212
Monitoring: Process Water Monitoring	1	Smpl. Pts.	$9,764	9,764	1	n/a	9,764	9,764
Monitoring: Stormwater Monitoring	1	Smpl. Pts.	$9,198	9,198	1	n/a	9,198	9,198
Monitoring: Recordkeeping	0	n/a	$0	0	0	n/a	0	0
Monitoring: Dmr Submission	4	hours	$35	141	1	$141	n/a	$ 141
TOTAL	n/a	n/a	n/a	n/a	n/a	n/a	n/a	**$32,456**

Table A- 6 Monitoring costs for small active sand & gravel pit

Type of Discharge	Pollutant	Cost Per Test	Sampling Labor Cost	Freq.	Freq Units	Total Cost
NAICS 212321 Process Water to Ground	Oil Sheen	0	30.66	300	Yearly	$9,198
NAICS 212321 Process Water to Ground	TDS	$16.50	30.66	12	Yearly	$566
Total Cost of NAICS 212321 Process Water to Ground	**n/a**	**n/a**	**n/a**	**n/a**	**n/a**	$9,764
NAICS 212321 Stormwater to Ground	Oil Sheen	0	30.66	300	Yearly	$9,198
Total Cost of NAICS 212321 Stormwater to Ground	**n/a**	**n/a**	**n/a**	**n/a**	**n/a**	$9,198
Highest Annual Cost	**n/a**	**n/a**	**n/a**	**n/a**	**n/a**	**$18,962**

A.5 Large, active sand and gravel pit – new

Assumptions:

- Four wet ponds. Each pond a 78 ft. X 85 ft. unlined wet pond. Depth 4-5 ft. with a 4:1 slope.
- Four grass-lined biofiltration swales.
- Process wastewater is pretreated by a 200 foot, grass-lined biofiltration swale. Need one such swale per 3 acres of disturbed area.
- SMP includes site map. Plan must be reviewed yearly, and updated as necessary.

- Oil water separator inspections 15 minutes monthly for six months plus events, plus wet & dry season inspections, plus visual surface water inspections. Environmental managers complete the wet and dry inspections at larger sites.
- Vehicle/equipment inspections conducted by drivers. 15 minutes * 5 days * 52 weeks * 9-10 per vehicle/equipment.
- Erosion and sediment control BMPs must be inspected once a week. Assume half hour per inspection.
- Must write a report on each inspection.
- No commingling of process water and stormwater.
- All Type 3 stormwater is treated by a 200 foot, grass-lined biofiltration swale. Need one such swale per 3 acres of disturbed area.
- Swale installed after hydromulching of exposed areas.
- Spill kits for fuel dock, maintenance shop, storage area.
- Vacuum or regenerative air sweeper.
- Stabilization BMPs focus on eliminating exposed soils that are exposed to stormwater. Five acres of disturbed area needs erosion control measures.
- Assume hydromulching for 1/4 to 1/2 of the site.
- Two process water monitoring sample points. Monitoring 12 months per year.
- One stormwater sample point. Monitoring four quarters per year.
- Copies of all monitoring reports, laboratory data, and quality assurance and control documentation must be retained for three to five years. The cost of complying with these requirements is the cost of storing records. This cost is either very low or zero.
- Daily monitoring when discharge occurs. Discharge occurs daily. Six-day work week.
- Must report DMRs every quarter.

Table A- 7 Compliance costs for large active sand & gravel pit -- new

ITEM	QUANTITY	UNITS	UNIT COST	COST	USEFUL LIFE (YEARS)	ANNUALIZED COST	ANNUAL O&M COST	TOTAL ANNUAL COST
Process Wastewater Management (Wet Pond): Grader	32	Hours	$39	$1,243	10	$202	n/a	$202
Process Wastewater Management (Wet Pond): Front-end Loader	32	Hours	$39	$1,243	10	$202	n/a	202
Process Wastewater Management (Wet Pond): Labor	128	Hours	$31	$3,924	10	$639	n/a	639

ITEM	QUANTITY	UNITS	UNIT COST	COST	USEFUL LIFE (YEARS)	ANNUALIZED COST	ANNUAL O&M COST	TOTAL ANNUAL COST
Process Wastewater Management (Wet Pond): Heavy Equipment Mobilization	48	Hours	$54	$2,589	10	$421	n/a	421
Biofiltration Swale: Grader, 4 Foot Wide	32	Hours	$39	$1,243	10	$202	n/a	202
Biofiltration Swale: Support Vehicle	32	Hours	$54	$1,726	10	$281	n/a	281
Biofiltration Swale: Labor	32	Hours	$31	$981	10	$160	n/a	160
Biofiltration Swale: Supervision	8	Hours	$35	$282	10	$46	n/a	46
Biofiltration Swale: Hydromulching of Swale	4	Unit	$539	$2,158	10	$351	n/a	351
Biofiltration Swale and Pond O & M: Mower	12	Hours	$43	$518	1	n/a	518	518
Biofiltration Swale and Pond O & M: Support Vehicle	16	Hours	$54	$863	1	n/a	863	863
Biofiltration Swale and Pond O & M: Labor	16	Hours	$31	$491	1	n/a	491	491
Site Management Plan: Write SMP	80	Hours	$82	$6,521	1	$6,521	n/a	6,521
Inspections: Labor	16	Hours	$31	$491	1	n/a	491	491
Inspections: Write Insp. Rpt.--Labor	6	Hours	$31	$184	1	n/a	184	184
Inspections: Write Insp. Rpt.--Supervision	2	Hours	$35	$71	1	n/a	71	71
Inspections: Vehicle / Equipment Inspections	600	Hours	$31	$18,396	1	n/a	18,396	18,396
Inspections: Sediment / Erosion Control Inspections	12	Hours	$31	$368	1	n/a	368	368
Inspections: Recordkeeping	0	Hours	$0	$0	0	n/a	0	0
Stormwater Pollution Prevention: Perimeter Berm and Resloping	172	Hours	$194	$33,404	10	$5,436	n/a	5,436
Stormwater Pollution Prevention: Biofiltration Swale	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a
Stormwater Pollution Prevention: Grader, 4 Foot Wide	8	Hours	$39	$311	10	$51	n/a	51
Stormwater Pollution Prevention: Support Vehicle	8	Hours	$54	$432	10	$70	n/a	70
Stormwater Pollution Prevention: Labor	8	Hours	$31	$245	10	$40	n/a	40

ITEM	QUANTITY	UNITS	UNIT COST	COST	USEFUL LIFE (YEARS)	ANNUALIZED COST	ANNUAL O&M COST	TOTAL ANNUAL COST
Stormwater Pollution Prevention: Supervision	2	Hours	$35	$71	10	$11	n/a	11
Stormwater Pollution Prevention: Hydromulching of Swale	1	Unit	$539	$539	10	$88	n/a	88
Stormwater Pollution Prevention: Wheel wash	1	Unit	$65,540	$65,540	10	$10,666	n/a	10,666
Stormwater Pollution Prevention: Vaccum or regenative air sweeper	1	Unit	$225,000	$225,000	10	$36,618	n/a	36,618
Activities (Biofiltration Swale O & M)**:**Mower	12	Hours	$43	$518	1	n/a	518	518
Activities (Biofiltration Swale O & M)**:**Support Vehicle	16	Hours	$54	$863	1	n/a	863	863
Activities (Biofiltration Swale O & M)**:**Labor	16	Hours	$31	$491	1	n/a	491	491
Activities (Biofiltration Swale O & M)**:**Spill Kit	3	Kit	$615	$1,845	1	n/a	1,845	1,845
Activities (Biofiltration Swale O & M)**:**Secondary Containment	3	Units	$710	$2,130	1	n/a	2,130	2,130
Activities (Biofiltration Swale O & M)**:**Street Sweeping	130	Hours	$31	$3,986	1	n/a	3,986	3,986
Erosion And Sediment Control (Stabilization BMPs)**:** Initial Site Stabilization	40	Hours	$22	$863	5	$228	n/a	228
Erosion And Sediment Control (Stabilization BMPs)**:** Heavy Equipment	40	Hours	$39	$1,554	5	$410	n/a	410
Erosion And Sediment Control (Stabilization BMPs)**:** Heavy Equipment Mobilization	4	Hours	$54	$216	5	$57	n/a	57
Erosion And Sediment Control (Stabilization BMPs)**:** Hydromulching of Exposed Areas	2	Acres	$2,158	$4,316	5	$1,138	n/a	1,138
Biofiltration Swale: Grader, 4 Foot Wide	8	Hours	$39	$311	10	$51	n/a	51
Biofiltration Swale: Support Vehicle	8	Hours	$54	$432	10	$70	n/a	70
Biofiltration Swale: Labor	8	Hours	$31	$245	10	$40	n/a	40

ITEM	QUANTITY	UNITS	UNIT COST	COST	USEFUL LIFE (YEARS)	ANNUALIZED COST	ANNUAL O&M COST	TOTAL ANNUAL COST
Biofiltration Swale: Supervision	2	Hours	$35	$71	10	$11	n/a	11
Biofiltration Swale: Hydromulching of Swale	1	Unit	$539	$539	10	$88	n/a	88
Biofiltration Swale O & M: Mower	3	Hours	$43	$129	1	n/a	129	129
Biofiltration Swale O & M: Support Vehicle	4	Hours	$54	$216	1	n/a	216	216
Biofiltration Swale O & M: Labor	4	Hours	$31	$123	1	n/a	123	123
Monitoring: Process Water Monitoring	2	Smpl. Pts.	$10,518	$21,037	1	n/a	21,037	$21,037
Monitoring: Stormwater Monitoring	1	Smpl. Pts.	$10,330	$10,330	1	n/a	10,330	$10,330
Monitoring: Recordkeeping	0	0	0	0	0	n/a	0	0
Monitoring: DMR Submission	4	hours	$35	141	1	$141		$ 141
GRAND TOTAL	n/a	n/a	n/a	n/a	n/a	n/a	n/a	**$127,288**

Table A- 8 Effluent monitoring costs for large active sand & gravel pit

Type of Discharge	Pollutant	Cost Per Test	Sampling Labor Cost	Freq.	Freq Units	Total Cost
NAICS 212321 Process Water to Surface	Turbidity	$16.50	30.66	24	Yearly	$1,132
NAICS 212321 Process Water to Surface	TSS	$16.50	30.66	4	Yearly	$189
NAICS 212321 Process Water to Surface	Oil Sheen	$0.00	30.66	300	Yearly	$9,198
Total Cost of NAICS 212321 Process Water to Surface	n/a	n/a	n/a	n/a	n/a	$10,518
NAICS 212321 Process Water to Ground	Oil Sheen	$0.00	30.66	300	Yearly	$9,198
NAICS 212321 Process Water to Ground	TDS	$16.50	30.66	12	Yearly	$566
Total Cost of NAICS 212321 Process Water to Ground	n/a	n/a	n/a	n/a	n/a	$9,198
NAICS 212321 Stormwater to Surface	Turbidity	$16.50	30.66	24	Yearly	$1,132
NAICS 212321 Stormwater to Surface	Oil Sheen	$0.00	30.66	300	Yearly	$9,198

Type of Discharge	Pollutant	Cost Per Test	Sampling Labor Cost	Freq.	Freq Units	Total Cost
Total Cost of NAICS 212321 Stormwater to Surface	n/a	n/a	n/a	n/a	n/a	$10,330
NAICS 212321 Stormwater to Ground	Oil Sheen	$0.00	30.66	300	Yearly	$9,198
Total Cost of NAICS 212321 Stormwater to Ground	n/a	n/a	n/a	n/a	n/a	$9,198
Highest Annual Cost	n/a	n/a	n/a	n/a	n/a	$20,848

A.6 Large, active sand and gravel pit – existing

Assumptions:

- Oil water separator inspections 15 minutes monthly for six months plus events, plus wet & dry season inspections, plus visual surface water inspections. Environmental managers complete the wet and dry inspections at larger sites.
- Vehicle/equipment inspections conducted by drivers. 15 minutes * 5 days * 52 weeks * 9-10 per vehicle/equipment
- Erosion and sediment control BMPs must be inspected once a week.
- Must write a report on each inspection.
- Spill kit for fuel dock, maintenance shop, storage area
- Vacuum or regenerative air sweeper.
- Stabilization BMPs focus on eliminating exposed soils that are exposed to stormwater. Five acres of disturbed area needs erosion control measures.
- Assume hydromulching 1/4 to 1/2 of the site.
- Two process water sample points assumed. Monitoring 12 months per year.
- One stormwater sample point assumed. Monitoring four quarters per year.
- Copies of all monitoring reports, laboratory data, and quality assurance and control documentation must be retained for three to five years. The cost of complying with these requirements is the cost of storing records. This cost is either very low or zero. It is assumed to be zero.
- Only updating SMP required.

- Daily monitoring when discharge occurs. Discharge occurs daily. Six-day work week.
- Must report DMRs every quarter.

Table A- 9 Compliance costs for large active sand & gravel pit -- existing

ITEM	QUANTITY	UNITS	UNIT COST	COST	USEFUL LIFE (YEARS)	ANNUALIZED COST	ANNUAL O&M COST	TOTAL ANNUAL COST
Process Wastewater Management (Biofiltration Swale and Pond O & M): Mower	12	Hours	43	518	1	$0	518	518
Process Wastewater Management (Biofiltration Swale and Pond O & M): Support Vehicle	16	Hours	54	863	1	$0	863	863
Process Wastewater Management (Biofiltration Swale and Pond O & M): Labor	16	Hours	31	491	1	$0	491	491
Site Management Plan: Update SMP	8	Hours	82	652	1	$717	652	1,369
Inspections: Labor	16	Hours	30.66	491	1	$0	491	491
Inspections: Write Insp. Rpt.--Labor	6	Hours	30.66	184	1	$0	184	184
Inspections: Write Insp. Rpt.--Supervision	2	Hours	35.28	71	1	$0	71	71
Inspections: Vehicle / Equipment Inspections	600	Hours	30.66	18,396	1	$0	18,396	18,396
Inspections: Sediment / Erosion Control Inpsections	12	Hours	30.66	368	1	$0	368	368
Inspections: Recordkeeping	0	Hours	0	0	0	$0	0	0
Activities (Biofiltration Swale O & M): Mower	12	Hours	43	518	1	$0	518	518
Activities (Biofiltration Swale O & M): Support Vehicle	16	Hours	54	863	1	$0	863	863
Activities (Biofiltration Swale O & M): Labor	16	Hours	31	491	1	$0	491	491
Activities (Biofiltration Swale O & M): Spill Kit	3	Kit	615	1,845	1	$0	1,845	1,845
Activities (Biofiltration Swale O & M): Secondary Containment	3	Units	710	2,130	1	$0	2,130	2,130
Activities (Biofiltration Swale O & M): Street Sweeping	130	Hours	31	3,986	1	$0	3,986	3,986

ITEM	QUANTITY	UNITS	UNIT COST	COST	USEFUL LIFE (YEARS)	ANNUALIZED COST	ANNUAL O&M COST	TOTAL ANNUAL COST
Erosion And Sediment Control (Stabilization BMPs) : Initial Site Stabilization	40	Hours	22	863	5	$228	0	228
Erosion And Sediment Control (Stabilization BMPs) : Heavy Equipment	40	Hours	39	1,554	5	$410	0	410
Erosion And Sediment Control (Stabilization BMPs) : Heavy Equipment Mobilization	4	Hours	54	216	5	$57	0	57
Erosion And Sediment Control (Stabilization BMPs) : Hydromulching of Exposed Areas	2	Acres	2,158	4,316	5	$1,138	0	1,138
Biofiltration Swale O & M: Mower	3	Hours	43	129	1	$0	129	129
Biofiltration Swale O & M: Support Vehicle	4	Hours	54	216	1	$0	216	216
Biofiltration Swale O & M: Labor	4	Hours	31	123	1	$0	123	123
Monitoring: Process Water Monitoring	2	Smpl. Pts.	$10,518	21,037	1	$0	21,037	$21,037
Monitoring: Stormwater Monitoring	1	Smpl. Pts.	$10,330	10,330	1	$0	10,330	$10,330
Monitoring: Recordkeeping	0	0	$0	0	0	$0	0	0
Monitoring: DMR Submission	4	hours	$35	141	1	$141	n/a	$141
GRAND TOTAL	n/a	n/a	n/a	n/a	n/a	n/a	n/a	**$66,391**

Table A- 10 Effluent monitoring costs for large active sand & gravel pit

Type of Discharge and Pollutant	Pollutant	Cost Per Test	Sampling Labor Cost	Freq.	Freq Units	Total Cost
NAICS 212321 Process Water to Surface	Turbidity	$16.50	30.66	24	Yearly	$1,132
NAICS 212321 Process Water to Surface	TSS	$16.50	30.66	4	Yearly	$189
NAICS 212321 Process Water to Surface	Oil Sheen	$0.00	30.66	300	Yearly	$9,198
Total Cost of NAICS 212321 Process Water to Surface	n/a	n/a	n/a	n/a	n/a	$10,518
NAICS 212321 Process Water to Ground	Oil Sheen	$0.00	30.66	300	Yearly	$9,198
NAICS 212321 Process Water to Ground	TDS	$16.50	30.66	12	Yearly	$566

Type of Discharge and Pollutant	Pollutant	Cost Per Test	Sampling Labor Cost	Freq.	Freq Units	Total Cost
Total Cost of NAICS 212321 Process Water to Ground	n/a	n/a	n/a	n/a	n/a	$9,198
NAICS 212321 Stormwater to Surface	Turbidity	$16.50	30.66	24	Yearly	$1,132
NAICS 212321 Stormwater to Surface	Oil Sheen	$0.00	30.66	300	Yearly	$9,198
Total Cost of NAICS 212321 Stormwater to Surface	n/a	n/a	n/a	n/a	n/a	$10,330
NAICS 212321 Stormwater to Ground	Oil Sheen	$0.00	30.66	300	Yearly	$9,198
Total Cost of NAICS 212321 Stormwater to Ground	n/a	n/a	n/a	n/a	n/a	$9,198
Highest Annual Cost	n/a	n/a	n/a	n/a	n/a	$20,848

A.7 Small, active sand and gravel pit with concrete and recycling – new

Assumptions:

- Three acres of disturbed area.
- 78 ft. X 85 ft. unlined wet pond. Depth 4-5 ft. with a 4:1 slope.
- Process wastewater is pretreated by a 200 foot, grass-lined biofiltration swale. Need one such swale per three acres of disturbed area.
- Lined Impoundment (i.e. containment basin). Concrete liner.
- CO2 sparging.
- Process water BMP O&M includes O&M for pond, swale, lined impoundment, and sparging unit
- pH adjustment includes 5,000 to 10,000 gal. tank. Injectors and control panel.
- pH labor includes checking on and maintaining Carbon Dioxide Adjustments.
- Time for writing materials acceptance procedures for concrete recycling.
- SMP includes site map. Plan must be reviewed and updated yearly.
- Must conduct two stormwater inspections per year.
- Vehicle/equipment inspections conducted by drivers
- Erosion and sediment control BMPs must be inspected once a week. Assume two Hours
- Must write a report on each inspection.

- No commingling of process water and stormwater.
- All Type 3 stormwater is treated by a 200 foot, grass-lined biofiltration swale. Need one such swale per three acres of disturbed area.
- Swale installed after hydromulching of exposed areas.
- Mechanical push broom sweeper
- Stabilization BMPs focus on eliminating exposed soils that are exposed to stormwater. Five acres of disturbed area needs erosion control measures.
- Copies of all monitoring reports, laboratory data, and quality assurance and control documentation must be retained for three to five years. The cost of complying with these requirements is the cost of storing records. This cost is either very low or zero.
- Daily monitoring when discharge occurs. Discharge occurs daily. Six-day work week.
- Must report DMRs every quarter.

Table A- 11 Compliance costs for small active sand & gravel pit with concrete and recycling -- new

ITEM	QUANTITY	UNITS	UNIT COST	COST	USEFUL LIFE (YEARS)	ANNUALIZED COST	ANNUAL O&M COST	TOTAL ANNUAL COST
Process Wastewater Management (Wet Pond): Grader	8	Hours	$39	$311	10	$51	$0	$51
Process Wastewater Management (Wet Pond): Front-end Loader	8	Hours	39	311	10	$51	0	51
Process Wastewater Management (Wet Pond): Labor	32	Hours	31	981	10	$160	0	160
Process Wastewater Management (Wet Pond): Heavy Equipment Mobilization	12	Hours	54	647	10	$105	0	105
Biofiltration Swale: Grader, 4 Foot Wide	8	Hours	39	311	10	$51	0	51
Biofiltration Swale: Support Vehicle	8	Hours	54	432	10	$70	0	70
Biofiltration Swale: Labor	8	Hours	31	245	10	$40	0	40
Biofiltration Swale: Supervision	2	Hours	35	71	10	$11	0	11
Biofiltration Swale: Hydromulching of Swale	1	Unit	539	539	10	$88	0	88
Biofiltration Swale: Lined Impoundment (Concrete Batch Plant)	1	Unit	4,747	4,747	10	$773	0	773
Biofiltration Swale: Carbon Dioxide pH Adjustment	1	Unit	10,789	10,789	5	$2,846	0	2,846

ITEM	QUANTITY	UNITS	UNIT COST	COST	USEFUL LIFE (YEARS)	ANNUALIZED COST	ANNUAL O&M COST	TOTAL ANNUAL COST
Process Water BMP O & M: Mower	3	Hours	43	129	1	n/a	129	129
Process Water BMP O & M: Support Vehicle	4	Hours	54	216	1	n/a	216	216
Process Water BMP O & M: Pond, Swale, Impoundment Labor	8	Hours	30.66	245	1	n/a	245	245
Process Water BMP O & M: Carbon Dioxide Refills -- pH Adjustment	2	Tank	107	213	1	n/a	213	213
Process Water BMP O & M: Labor -- pH adjustment	260	Hours	30.66	7,972	1	n/a	7,972	7,972
Site Management Plan: Write SMP	92	Hours	81.51	7,499	1	$7,499	n/a	7,499
Site Management Plan: Writing Materials Handling Procedures	8	Hours	81.51	652	5	$172	n/a	172
Inspections: Labor	16	Hours	30.66	491	1	n/a	491	491
Inspections: Write Insp. Rpt.--Labor	6	Hours	30.66	184	1	n/a	184	184
Inspections: Write Insp. Rpt.-- Supervision	2	Hours	35.28	71	1	n/a	71	71
Inspections: Vehicle / Equipment Inspections	600	Hours	30.66	18,396	1	n/a	18,396	18,396
Inspections: Sediment / Erosion Control Inpsections	12	Hours	30.66	368	1	n/a	368	368
Inspections: Recordkeeping	0	Hours	0	0	0	n/a	0	0
Stormwater Pollution Prevention: Perimeter Berm and Resloping	86	Hours	194	16,702	10	$2,718	n/a	2,718
Stormwater Pollution Prevention: Grader, 4 Foot Wide	8	Hours	39	311	10	$51	n/a	51
Stormwater Pollution Prevention: Support Vehicle	8	Hours	54	432	10	$70	n/a	70
Stormwater Pollution Prevention: Labor	8	Hours	31	245	10	$40	n/a	40
Stormwater Pollution Prevention: Supervision	2	Hours	35	71	10	$11	n/a	11
Stormwater Pollution Prevention: Hydromulching of Swale	1	Unit	539	539	10	$88	n/a	88
Stormwater Pollution Prevention: Spill Kit	3	Kit	615	1,845	1	$1,845	n/a	1,845
Stormwater Pollution Prevention: Secondary Containment	3	Unit	709.95	2,130	1	$2,130	n/a	2,130

ITEM	QUANTITY	UNITS	UNIT COST	COST	USEFUL LIFE (YEARS)	ANNUALIZED COST	ANNUAL O&M COST	TOTAL ANNUAL COST
Stormwater Pollution Prevention: Mechanical Sweeper	1	Unit	220,084	220,084	10	$35,818	n/a	35,818
Activities (Biofiltration Swale O & M)**:** Mower	3	Hours	43	129	1	n/a	129	129
Activities (Biofiltration Swale O & M)**:** Support Vehicle	4	Hours	54	216	1	n/a	216	216
Activities (Biofiltration Swale O & M)**:** Labor	4	Hours	30.66	123	1	n/a	123	123
Activities (Biofiltration Swale O & M)**:** Street Sweeping	130	Hours	30.66	3,986	1	n/a	3,986	3,986
Erosion And Sediment Control (Stabilization BMPs): Initial Site Stabilization	40	Hours	22	863	5	$228	n/a	228
Erosion And Sediment Control (Stabilization BMPs): Heavy Equipment	40	Hours	39	1,554	5	$410	n/a	410
Erosion And Sediment Control (Stabilization BMPs): Heavy Equipment Mobilization	4	Hours	54	216	5	$57	n/a	57
Erosion And Sediment Control (Stabilization BMPs): Hydromulching of Exposed Areas	3	Acres	2,158	6,474	5	$1,708	n/a	1,708
Biofiltration Swale: Grader, 4 Foot Wide	8	Hours	39	311	10	$51	n/a	51
Biofiltration Swale: Support Vehicle	8	Hours	54	432	10	$70	n/a	70
Biofiltration Swale: Labor	8	Hours	31	245	10	$40	n/a	40
Biofiltration Swale: Supervision	2	Hours	35	71	10	$11	n/a	11
Biofiltration Swale: Hydromulching of Swale	1	Unit	539	539	10	$88	n/a	88
Biofiltration Swale O & M: Mower	3	Hours	43	129	1	n/a	129	129
Biofiltration Swale O & M: Support Vehicle	4	Hours	54	216	1	n/a	216	216
Biofiltration Swale O & M: Labor	4	Hours	30.66	123	1	n/a	123	123
Monitoring: PIT Process Water Monitoring	1	Smpl. Pts.	$10,518	10,518	1	n/a	10,518	$10,518
Monitoring: ReadyMix / Concrete Recycling Process Water Monitoring	1	Smpl. Pts.	$11,084	11,084	1	n/a	11,084	$11,084

ITEM	QUANTITY	UNITS	UNIT COST	COST	USEFUL LIFE (YEARS)	ANNUALIZED COST	ANNUAL O&M COST	TOTAL ANNUAL COST
Monitoring: PIT Stormwater Monitoring	1	Smpl. Pts.	$10,330	10,330	1	n/a	10,330	$10,330
Monitoring: ReadyMix / Concrete Recycling Stormwater Monitoring	1	Smpl. Pts.	$10,896	10,896	1	n/a	10,896	$10,896
Monitoring: Recordkeeping	0	0	$0	0	0	n/a	0	0
Monitoring: DMR Submission	4	hours	$35	141	1	$141	n/a	$141
GRAND TOTAL	n/a	n/a	n/a	n/a	n/a	n/a	n/a	**$133,525**

Table A- 12 Effluent monitoring costs for small active sand & gravel pit with concrete and recycling

Type of Discharge	Pollutant	Cost Per Test	Sampling Labor Cost	Freq.	Freq Units	Total Cost
NAICS 212321 Process Water to Surface	Turbidity	16.50	30.66	24	Yearly	$1,132
NAICS 212321 Process Water to Surface	TSS	16.50	30.66	4	Yearly	$189
NAICS 212321 Process Water to Surface	Oil Sheen	0	30.66	300	Yearly	$9,198
Total Cost of NAICS 212321 Process Water to Surface	n/a	n/a	n/a	n/a	n/a	$10,518
NAICS 212321 Process Water to Ground	Oil Sheen	0	30.66	300	Yearly	$9,198
NAICS 212321 Process Water to Ground	TDS	$16.50	30.66	12	Yearly	$47
Total Cost of NAICS 212321 Process Water to Ground	n/a	n/a	n/a	n/a	n/a	$9,245
NAICS 212321 Stormwater to Surface	Turbidity	16.50	30.66	24	Yearly	$1,132
NAICS 212321 Stormwater to Surface	Oil Sheen	0	30.66	300	Yearly	$9,198
Total Cost of NAICS 212321 Stormwater to Surface	n/a	n/a	n/a	n/a	n/a	$10,330
NAICS 212321 Stormwater to Ground	Oil Sheen	0	30.66	300	Yearly	$9,198
Total Cost of NAICS 212321 Stormwater to Ground	n/a	n/a	n/a	n/a	n/a	$9,198
NAICS 327320 & ECY002 Process Water to Surface	pH	16.50	30.66	12	Yearly	$566
NAICS 327320 & ECY002 Process Water to Surface	Turbidity	16.50	30.66	24	Yearly	$1,132

Type of Discharge	Pollutant	Cost Per Test	Sampling Labor Cost	Freq.	Freq Units	Total Cost
NAICS 327320 & ECY002 Process Water to Surface	TSS	16.50	30.66	4	Yearly	$189
NAICS 327320 & ECY002 Process Water to Surface	Oil Sheen	0	30.66	300	Yearly	$9,198
Total Cost of NAICS 327320 & ECY002 Process Water to Surface	n/a	n/a	n/a	n/a	n/a	$11,084
NAICS 327320 & ECY002 Process Water to Ground	pH	16.50	30.66	12	Yearly	$566
NAICS 327320 & ECY002 Process Water to Ground	Oil Sheen	0	30.66	300	Yearly	$9,198
NAICS 327320 & ECY002 Process Water to Ground	TDS	$16.50	30.66	12	Yearly	$566
Total Cost NAICS 327320 & ECY002 Process Water to Ground	n/a	n/a	n/a	n/a	n/a	$10,330
NAICS 327320 & ECY002 Stormwater to Surface	pH	16.50	30.66	12	Yearly	$566
NAICS 327320 & ECY002 Stormwater to Surface	Turbidity	16.50	30.66	24	Yearly	$1,132
NAICS 327320 & ECY002 Stormwater to Surface	Oil Sheen	0	30.66	300	Yearly	$9,198
Total Cost NAICS 327320 & ECY002 Stormwater to Surface	n/a	n/a	n/a	n/a	n/a	$10,896
NAICS 327320 & ECY002 Stormwater to Ground	pH	16.50	30.66	12	Yearly	$566
NAICS 327320 & ECY002 Stormwater to Ground	Oil Sheen	0	30.66	300	Yearly	$9,198
Total Cost of NAICS 327320 & ECY002 Stormwater to Ground	n/a	n/a	n/a	n/a	n/a	$9,764

A.8 Small, active sand and gravel pit with concrete and recycling – existing

Assumptions:

- Three acres of disturbed area.
- Process water BMP O&M includes O&M for pond, swale, lined impoundment, and sparging unit.
- Sparging includes 5,000 to 10,000 gal. tank. Injectors and control panel.

- pH adjustment labor includes checking on and maintaining Carbon Dioxide Adjustments
- Time for writing materials acceptance procedures for concrete recycling.
- Must conduct two stormwater inspections per year.
- Vehicle/equipment inspections conducted by drivers
- Erosion and sediment control BMPs must be inspected once a week.
- Must write a report on each inspection.
- Mechanical push broom sweeper
- Stabilization BMPs focus on eliminating exposed soils that are exposed to stormwater. Five acres of disturbed area needs erosion control measures.
- Copies of all monitoring reports, laboratory data, and quality assurance and control documentation must be retained for three to five years. The cost of complying with these requirements is the cost of storing records. This cost is either very low or zero.
- SMP requires only updating.
- Daily monitoring when discharge occurs. Discharge occurs daily. Six-day work week.
- Must report DMRs every quarter.

Table A- 13 Compliance costs for small active sand & gravel pit with concrete and recycling -- existing

ITEM	QUANTITY	UNITS	UNIT COST	COST	USEFUL LIFE (YEARS)	ANNUALIZED COST	ANNUAL O&M COST	TOTAL ANNUAL COST
Process Wastewater Management (Process Water BMP O & M): Mower	3	Hours	43	129	1	n/a	129	129
Process Wastewater Management (Process Water BMP O & M): Support Vehicle	4	Hours	54	216	1	n/a	216	216
Process Wastewater Management (Process Water BMP O & M): Pond, Swale, Impoundment Labor	8	Hours	31	245	1	n/a	245	245
Process Wastewater Management (Process Water BMP O & M): Carbon Dioxide Refills -- pH Adjustment	2	Tank	107	213	1	n/a	213	213
Process Wastewater Management (Process Water BMP O & M): Labor -- pH adjustment	260	Hours	31	7,972	1	n/a	7,972	7,972
Site Management Plan: Update SMP	8	Hours	81.51	652	1	$652	n/a	652
Site Management Plan: Writing Materials Handling Procedures	8	Hours	81.51	652	5	$172	n/a	172

ITEM	QUANTITY	UNITS	UNIT COST	COST	USEFUL LIFE (YEARS)	ANNUALIZED COST	ANNUAL O&M COST	TOTAL ANNUAL COST
Inspections: Labor	16	Hours	30.66	491	1	n/a	491	491
Inspections: Write Insp. Rpt.--Labor	6	Hours	30.66	184	1	n/a	184	184
Inspections: Write Insp. Rpt.--Supervision	2	Hours	35.28	71	1	n/a	71	71
Inspections: Vehicle / Equipment Inspections	600	Hours	30.66	18,396	1	n/a	18,396	18,396
Inspections: Sediment / Erosion Control Inspections	12	Hours	30.66	368	1	n/a	368	368
Inspections: Recordkeeping	0	Hours	0	0	0	n/a	0	0
Inspections: Spill Kit	3	Kit	615	1,845	1	$1,845	n/a	1,845
Stormwater Pollution Prevention (Biofiltration Swale O & M): Mower	3	Hours	43	129	1	n/a	129	129
Stormwater Pollution Prevention (Biofiltration Swale O & M): Support Vehicle	4	Hours	54	216	1	n/a	216	216
Stormwater Pollution Prevention (Biofiltration Swale O & M): Labor	4	Hours	31	123	1	n/a	123	123
Stormwater Pollution Prevention (Biofiltration Swale O & M): Street Sweeping	130	Hours	31	3,986	1	n/a	3,986	3,986
Erosion And Sediment Control (Stabilization Bmps): Initial Site Stabilization	40	Hours	22	863	5	$228	n/a	228
Erosion And Sediment Control (Stabilization Bmps): Heavy Equipment	40	Hours	39	1,554	5	$410	n/a	410
Erosion And Sediment Control (Stabilization Bmps): Heavy Equipment Mobilization	4	Hours	54	216	5	$57	n/a	57
Erosion And Sediment Control (Stabilization Bmps): Hydromulching of Exposed Areas	3	Acres	2,158	6,474	5	$1,708	n/a	1,708
Erosion And Sediment Control (Biofiltration Swale O & M): Mower	3	Hours	43	129	1	n/a	129	129
Erosion And Sediment Control (Biofiltration Swale O & M): Support Vehicle	4	Hours	54	216	1	n/a	216	216
Erosion And Sediment Control (Biofiltration Swale O & M): Labor	4	Hours	31	123	1	n/a	123	123

ITEM	QUANTITY	UNITS	UNIT COST	COST	USEFUL LIFE (YEARS)	ANNUALIZED COST	ANNUAL O&M COST	TOTAL ANNUAL COST
Monitoring: PIT Process Water Monitoring	1	Smpl. Pts.	10,518	10,518	1	n/a	10,518	$10,518
Monitoring: ReadyMix / Concrete Recycling Process Water Monitoring	1	Smpl. Pts.	11,084	11,084	1	n/a	11,084	$11,084
Monitoring: PIT Stormwater Monitoring	1	Smpl. Pts.	10,330	10,330	1	n/a	10,330	$10,330
Monitoring: ReadyMix / Concrete Recycling Stormwater Monitoring	1	Smpl. Pts.	10,896	10,896	1	n/a	10,896	$10,896
Monitoring: Recordkeeping	0	0	0	0	0	n/a	0	0
Monitoring: DMR Submission	4	hours	35	141	1	$141	n/a	$141
TOTAL	n/a	n/a	n/a	n/a	n/a	n/a	n/a	**$81,247**

Table A- 14 Effluent monitoring costs for small active sand & gravel pit with concrete and recycling

Type of Discharge	Pollutant	Cost Per Test	Sampling Labor Cost	Freq.	Freq Units	Total Cost
NAICS 212321 Process Water to Surface	Turbidity	16.50	30.66	24	Yearly	$1,132
NAICS 212321 Process Water to Surface	TSS	16.50	30.66	4	Yearly	$189
NAICS 212321 Process Water to Surface	Oil Sheen	0	30.66	300	Yearly	$9,198
Total Cost of NAICS 212321 Process Water to Surface	n/a	n/a	n/a	n/a	n/a	$10,518
NAICS 212321 Process Water to Ground	Oil Sheen	0	30.66	300	Yearly	$9,198
NAICS 212321 Process Water to Ground	TDS	16.50	30.66	12	Yearly	$47
Total Cost of NAICS 212321 Process Water to Ground	n/a	n/a	n/a	n/a	n/a	$9,245
NAICS 212321 Stormwater to Surface	Turbidity	16.50	30.66	24	Yearly	$1,132
NAICS 212321 Stormwater to Surface	Oil Sheen	0	30.66	300	Yearly	$9,198
Total Cost of NAICS 212321 Stormwater to Surface	n/a	n/a	n/a	n/a	n/a	$10,330
NAICS 212321 Stormwater to Ground	Oil Sheen	0	30.66	300	Yearly	$9,198
Total Cost of NAICS 212321 Stormwater to Surface	n/a	n/a	n/a	n/a	n/a	$9,198
NAICS 327320 & ECY002 Process Water to Surface	pH	16.50	30.66	12	Yearly	$566

Type of Discharge	Pollutant	Cost Per Test	Sampling Labor Cost	Freq.	Freq Units	Total Cost
NAICS 327320 & ECY002 Process Water to Surface	Turbidity	16.50	30.66	24	Yearly	$1,132
NAICS 327320 & ECY002 Process Water to Surface	TSS	16.50	30.66	4	Yearly	$189
NAICS 327320 & ECY002 Process Water to Surface	Oil Sheen	0	30.66	300	Yearly	$9,198
Total Cost of NAICS 327320 & ECY002 Process Water to Surface	n/a	n/a	n/a	n/a	n/a	$11,084
NAICS 327320 & ECY002 Process Water to Ground	pH	16.50	30.66	12	Yearly	$566
NAICS 327320 & ECY002 Process Water to Ground	Oil Sheen	0	30.66	300	Yearly	$9,198
NAICS 327320 & ECY002 Process Water to Ground	TDS	16.50	30.66	12	Yearly	$566
Total Cost of NAICS 327320 & ECY002 Process Water to Ground	n/a	n/a	n/a	n/a	n/a	$10,330
NAICS 327320 & ECY002 Stormwater to Surface	pH	16.50	30.66	12	Yearly	$566
NAICS 327320 & ECY002 Stormwater to Surface	Turbidity	16.50	30.66	24	Yearly	$1,132
NAICS 327320 & ECY002 Stormwater to Surface	Oil Sheen	0	30.66	300	Yearly	$9,198
Total Cost of NAICS 327320 & ECY002 Stormwater to Surface	n/a	n/a	n/a	n/a	n/a	$10,896
NAICS 327320 & ECY002 Stormwater to Ground	pH	16.50	30.66	12	Yearly	$566
NAICS 327320 & ECY002 Stormwater to Ground	Oil Sheen	0	30.66	300	Yearly	$9,198
Total Cost of NAICS 327320 & ECY002 Stormwater to Ground	n/a	n/a	n/a	n/a	n/a	$9,764

A.9 Large, active sand and gravel pit with concrete and recycling – new

Assumptions:

- Four wet ponds. Each pond a 78 ft. X 85 ft. unlined wet pond. Depth 4-5 ft. with a 4:1 slope.

- Four grass-lined biofiltration swales.
- Process wastewater is pretreated by a 200 foot, grass-lined biofiltration swale. Need one such swale per 3 acres of disturbed area.
- Lined Impoundment (i.e. containment basin). Assume concrete liner.
- CO2 sparging.
- Sparging includes 5,000 to 10,000 gal. tank. Injectors and control panel.
- pH adjustment includes checking on and maintaining Carbon Dioxide Adjustments
- SMP includes site map. Plan must be reviewed and updated yearly.
- Time for writing materials acceptance procedures for concrete recycling.
- Must conduct two stormwater inspections per year.
- Vehicle/equipment inspections conducted by drivers
- Erosion and sediment control BMPs must be inspected once a week. Assume two Hours
- Must write a report on each inspection.
- No commingling of process water and stormwater.
- All Type 3 stormwater is treated by a 200 foot, grass-lined biofiltration swale. Need one such swale per three acres of disturbed area.
- Swale installed after hydromulching of exposed areas.
- Secondary containment should consist of a bermed concrete pad with a roof
- Mechanical push broom sweeper
- Stabilization BMPs focus on eliminating exposed soils that are exposed to stormwater. Five acres of disturbed area needs erosion control measures.
- Four sample points assumed. Assume monitoring 12 months per year.
- Copies of all monitoring reports, laboratory data, and quality assurance and control documentation must be retained for three to five years. The cost of complying with these requirements is the cost of storing records. This cost is either very low or zero.
- Daily monitoring when discharge occurs. Discharge occurs daily. Six-day work week.
- Must report DMRs every quarter.

Table A- 15 Compliance costs for large active sand & gravel pit with concrete and recycling -- new

ITEM	QUANTITY	UNITS	UNIT COST	COST	USEFUL LIFE (YEARS)	ANNUALIZED COST	ANNUAL O&M COST	TOTAL ANNUAL COST
Process Wastewater Management (Wet Pond): Grader	32	Hours	$39	$1,243	10	$202	n/a	$202
Process Wastewater Management (Wet Pond): Front-end Loader	32	Hours	39	1,243	10	$202	n/a	202
Process Wastewater Management (Wet Pond): Labor	128	Hours	31	3,924	10	$639	n/a	639
Process Wastewater Management (Wet Pond): Heavy Equipment Mobilization	48	Hours	54	2,589	10	$421	n/a	421
Process Wastewater Management (Biofiltration Swale): Grader, 4 Foot Wide	32	Hours	39	1,243	10	$202	n/a	202
Process Wastewater Management (Biofiltration Swale): Support Vehicle	32	Hours	54	1,726	10	$281	n/a	281
Process Wastewater Management (Biofiltration Swale): Labor	32	Hours	31	981	10	$160	n/a	160
Process Wastewater Management (Biofiltration Swale): Supervision	8	Hours	35	282	10	$46	n/a	46
Process Wastewater Management (Biofiltration Swale): Hydromulching of Swale	4	Unit	539	2,158	10	$351	n/a	351
Process Wastewater Management (Biofiltration Swale): Lined Impoundment (Concrete Batch Plant)	1	Unit	4,747	4,747	10	$773	n/a	773
Process Wastewater Management (Biofiltration Swale): Recycling Pond System - Concrete Batch	1	Unit	118,684	118,684	10	$19,315	n/a	19,315
Process Wastewater Management (Biofiltration Swale): Carbon Dioxide pH Adjustment	1	Unit	10,789	10,789	5	$2,846	n/a	2,846
Process Wastewater Management (Biofiltration Swale and Pond O & M): Mower	12	Hours	43	518	1	n/a	518	518
Process Wastewater Management (Biofiltration Swale and Pond O & M): Support Vehicle	16	Hours	54	863	1	n/a	863	863

ITEM	QUANTITY	UNITS	UNIT COST	COST	USEFUL LIFE (YEARS)	ANNUALIZED COST	ANNUAL O&M COST	TOTAL ANNUAL COST
Process Wastewater Management (Biofiltration Swale and Pond O & M): Pond, Swale, Impoundment Labor	8	Hours	30.66	245	1	n/a	245	245
Process Wastewater Management (Biofiltration Swale and Pond O & M): Carbon Dioxide Refills -- pH Adjustment	2	Tank	106.75	213	1	n/a	213	213
Process Wastewater Management (Biofiltration Swale and Pond O & M): Labor -- pH adjustment	260	Hours	30.66	7,972	1	n/a	7,972	7,972
Site Management Plan: Write SMP	120	Hours	81.51	9,782	1	9,782	n/a	9,782
Site Management Plan: Writing Materials Handling Procedures	8	Hours	81.51	652	5	$172	n/a	172
Inspections: Labor	24	Hours	30.66	736	1	n/a	736	736
Inspections: Write Insp. Rpt.--Labor	8	Hours	30.66	245	1	n/a	245	245
Inspections: Write Insp. Rpt.-- Supervision	2	Hours	35.28	71	1	n/a	71	71
Inspections: Vehicle / Equipment Inspections	900	Hours	30.66	27,594	1	n/a	27,594	27,594
Inspections: Sediment / Erosion Control Inspections	16	Hours	30.66	491	1	n/a	491	491
Inspections: Recordkeeping	0	Hours	0	0	0	n/a	n/a	0
Stormwater Pollution Prevention: Perimeter Berm and Resloping	172	Hours	194	33,404	10	$5,436	n/a	5,436
Stormwater Pollution Prevention: (Biofiltration Swale): Grader, 4 Foot Wide	8	Hours	39	311	10	$51	n/a	51
Stormwater Pollution Prevention: (Biofiltration Swale): Support Vehicle	8	Hours	54	432	10	$70	n/a	70
Stormwater Pollution Prevention: (Biofiltration Swale): Labor	8	Hours	31	245	10	$40	n/a	40
Stormwater Pollution Prevention: (Biofiltration Swale): Supervision	2	Hours	35	71	10	$11	n/a	11
Stormwater Pollution Prevention: (Biofiltration Swale): Hydromulching of Swale	1	Unit	539	539	10	$88	n/a	88
Stormwater Pollution Prevention: (Biofiltration Swale): Spill Kit	5	Kit	615	3,075	1	$3,075	n/a	3,075

ITEM	QUANTITY	UNITS	UNIT COST	COST	USEFUL LIFE (YEARS)	ANNUALIZED COST	ANNUAL O&M COST	TOTAL ANNUAL COST
Stormwater Pollution Prevention: (Biofiltration Swale): Secondary Containment	1	Unit	4315.78	4,316	10	$702	n/a	702
Stormwater Pollution Prevention: (Biofiltration Swale):	1	Unit	65540.19	65,540	10	$10,666	n/a	10,666
Stormwater Pollution Prevention: (Biofiltration Swale): Regenative air or vaccum Sweeper	1	Unit	225,000	225,000	10	$36,618	n/a	36,618
Activities (Biofiltration Swale O & M): Mower	12	Hours	43	518	1	n/a	518	518
Activities (Biofiltration Swale O & M): Support Vehicle	16	Hours	53.95	863	1	n/a	863	863
Activities (Biofiltration Swale O & M): Labor	16	Hours	30.66	491	1	n/a	491	491
Activities (Biofiltration Swale O & M): Street Sweeping	130	Hours	30.66	3,986	1	n/a	3,986	3,986
Erosion And Sediment Control (Stabilization BMPs): Initial Site Stabilization	40	Hours	22	863	5	$228	n/a	228
Erosion And Sediment Control (Stabilization BMPs): Heavy Equipment	40	Hours	39	1,554	5	$410	n/a	410
Erosion And Sediment Control (Stabilization BMPs): Heavy Equipment Mobilization	4	Hours	54	216	5	$57	n/a	57
Erosion And Sediment Control (Stabilization BMPs): Hydromulching of Exposed Areas	5	Acres	2,158	10,789	5	$2,846	n/a	2,846
Erosion And Sediment Control (Biofiltration Swale):Grader, 4 Foot Wide	8	Hours	39	311	10	$51	n/a	51
Erosion And Sediment Control (Biofiltration Swale):Support Vehicle	8	Hours	54	432	10	$70	n/a	70
Erosion And Sediment Control (Biofiltration Swale): Labor	8	Hours	31	245	10	$40	n/a	40
Erosion And Sediment Control (Biofiltration Swale):Supervision	2	Hours	35	71	10	$11	n/a	11
Erosion And Sediment Control (Biofiltration Swale): Hydromulching of Swale	1	Unit	539	539	10	$88	n/a	88
Erosion And Sediment Control (Biofiltration Swale O & M): Mower	3	Hours	43	129	1	n/a	129	129

ITEM	QUANTITY	UNITS	UNIT COST	COST	USEFUL LIFE (YEARS)	ANNUALIZED COST	ANNUAL O&M COST	TOTAL ANNUAL COST
Erosion And Sediment Control (Biofiltration Swale O & M): Support Vehicle	4	Hours	53.95	216	1	n/a	216	216
Erosion And Sediment Control (Biofiltration Swale O & M): Labor	4	Hours	30.66	123	1	n/a	123	123
Monitoring: PIT Process Water Monitoring	2	Smpl. Pts.	$10,518	21,037	1	n/a	21,037	$21,037
Monitoring: ReadyMix / Concrete Recycling Process Water Monitoring	2	Smpl. Pts.	$11,084	22,169	1	n/a	22,169	$22,169
Monitoring: PIT Stormwater Monitoring	1	Smpl. Pts.	$10,330	10,330	1	n/a	10,330	$10,330
Monitoring: ReadyMix / Concrete Recycling Stormwater Monitoring	2	Smpl. Pts.	$10,896	21,792	1	n/a	21,792	$21,792
Monitoring: Recordkeeping	0	0	$0	0	0	n/a	0	0
Monitoring: DMR Submission	4	hours	$35	141	1	$141	n/a	$141
GRAND TOTAL	n/a	n/a	n/a	n/a	n/a	n/a	n/a	**$216,692**

Table A- 16 Effluent monitoring costs for large active sand & gravel pit with concrete and recycling

Type of Discharge	Pollutant	Cost Per Test	Sampling Labor Cost	Freq.	Freq Units	Total Cost
NAICS 212321 Process Water to Surface	Turbidity	16.50	30.66	24	Yearly	$1,132
NAICS 212321 Process Water to Surface	TSS	16.50	30.66	4	Yearly	$189
NAICS 212321 Process Water to Surface	Oil Sheen	0	30.66	300	Yearly	$9,198
Total Cost of NAICS 212321 Process Water to Surface	n/a	n/a	n/a	n/a	n/a	$10,518
NAICS 212321 Process Water to Ground	Oil Sheen	0	30.66	300	Yearly	$9,198
NAICS 212321 Process Water to Ground	TDS	$16.50	30.66	12	Yearly	$566
Total Cost of NAICS 212321 Process Water to Ground	n/a	n/a	n/a	n/a	n/a	$9,198
NAICS 212321 Stormwater to Surface	Turbidity	16.50	30.66	24	Yearly	$1,132
NAICS 212321 Stormwater to Surface	Oil Sheen	0	30.66	300	Yearly	$9,198

Type of Discharge	Pollutant	Cost Per Test	Sampling Labor Cost	Freq.	Freq Units	Total Cost
Total Cost of NAICS 212321 Stormwater to Surface	n/a	n/a	n/a	n/a	n/a	$10,330
NAICS 212321 Stormwater to Ground	Oil Sheen	0	30.66	300	Yearly	$9,198
Total Cost of NAICS 212321 Stormwater to Ground	n/a	n/a	n/a	n/a	n/a	$9,198
NAICS 327320 & ECY002 Process Water to Surface	pH	16.50	30.66	12	Yearly	$566
NAICS 327320 & ECY002 Process Water to Surface	Turbidity	16.50	30.66	24	Yearly	$1,132
NAICS 327320 & ECY002 Process Water to Surface	TSS	16.50	30.66	4	Yearly	$189
NAICS 327320 & ECY002 Process Water to Surface	Oil Sheen	0.00	30.66	300	Yearly	$9,198
Total Cost of NAICS 327320 & ECY002 Process Water to Surface	n/a	n/a	n/a	n/a	n/a	$11,084
NAICS 327320 & ECY002 Process Water to Ground	pH	16.50	30.66	12	Yearly	$566
NAICS 327320 & ECY002 Process Water to Ground	Oil Sheen	0.00	30.66	300	Yearly	$9,198
NAICS 327320 & ECY002 Process Water to Ground	TDS	$16.50	30.66	12	Yearly	$566
Total Cost of NAICS 327320 & ECY002 Process Water to Ground	n/a	n/a	n/a	n/a	n/a	$10,330
NAICS 327320 & ECY002 Stormwater to Surface	pH	16.50	30.66	12	Yearly	$566
NAICS 327320 & ECY002 Stormwater to Surface	Turbidity	16.50	30.66	24	Yearly	$1,132
NAICS 327320 & ECY002 Stormwater to Surface	Oil Sheen	0.00	30.66	300	Yearly	$9,198

Type of Discharge	Pollutant	Cost Per Test	Sampling Labor Cost	Freq.	Freq Units	Total Cost
Total Cost of NAICS 327320 & ECY002 Stormwater to Surface	n/a	n/a	n/a	n/a	n/a	$10,896
NAICS 327320 & ECY002 Stormwater to Ground	pH	16.50	30.66	12	Yearly	$566
NAICS 327320 & ECY002 Stormwater to Ground	Oil Sheen	0.00	30.66	300	Yearly	$9,198
Total Cost of NAICS 327320 & ECY002 Stormwater to Ground	n/a	n/a	n/a	n/a	n/a	$9,764

A.10 Large, active sand and gravel pit with concrete and recycling – existing

Assumptions:

- pH adjustment includes 5,000 to 10,000 gal. tank. Injectors and control panel.
- pH adjustment labor includes checking on and maintaining Carbon Dioxide Adjustments
- Time for writing materials acceptance procedures for concrete recycling.
- Must conduct two stormwater inspections per year.
- Vehicle/equipment inspections conducted by drivers
- Erosion and sediment control BMPs must be inspected once a week. Assume two Hours
- Must write a report on each inspection.
- Mechanical push broom sweeper
- Stabilization BMPs focus on eliminating exposed soils that are exposed to stormwater. Five acres of disturbed area needs erosion control measures.
- Four sample points assumed. Assume monitoring 12 months per year.
- Copies of all monitoring reports, laboratory data, and quality assurance and control documentation must be retained for three to five years. The cost of complying with these requirements is the cost of storing records. This cost is either very low or zero.
- Only updating of SMP is required.
- Daily monitoring when discharge occurs. Discharge occurs daily. Six-day work week.

- Must report DMRs every quarter.

Table A- 17 Compliance costs for large active sand & gravel pit with concrete and recycling -- existing

ITEM	QUANTITY	UNITS	UNIT COST	COST	USEFUL LIFE (YEARS)	ANNUALIZED COST	ANNUAL O&M COST	TOTAL ANNUAL COST
Process Wastewater Management (Biofiltration Swale and Pond O & M): Mower	12	Hours	43	518	1	n/a	518	518
Process Wastewater Management (Biofiltration Swale and Pond O & M): Support Vehicle	16	Hours	54	863	1	n/a	863	863
Process Wastewater Management (Biofiltration Swale and Pond O & M): Pond, Swale, Impoundment Labor	8	Hours	31	245	1	n/a	245	245
Process Wastewater Management (Biofiltration Swale and Pond O & M): Carbon Dioxide Refills -- pH Adjustment	2	Tank	107	213	1	n/a	213	213
Process Wastewater Management (Biofiltration Swale and Pond O & M): Labor -- pH adjustment	260	Hours	31	7,972	1	n/a	7,972	7,972
Site Management Plan: Update SMP	8	Hours	82	652	1	652	n/a	652
Site Management Plan: Writing Materials Handling Procedures	8	Hours	82	652	5	$172	n/a	172
Inspections: Labor	24	Hours	31	736	1	n/a	736	736
Inspections: Write Insp. Rpt.--Labor	8	Hours	31	245	1	n/a	245	245
Inspections: Write Insp. Rpt.--Supervision	2	Hours	31	61	1	n/a	61	61
Inspections: Vehicle / Equipment Inspections	900	Hours	35	31,752	1	n/a	31,752	31,752
Inspections: Sediment / Erosion Control Inpsections	16	Hours	31	491	1	n/a	491	491
Inspections: Recordkeeping	0	Hours	0	0	0	n/a	0	0
Stormwater Pollution Prevention (Biofiltration Swale O & M): Mower	12	Hours	43	518	1	n/a	518	518
Stormwater Pollution Prevention (Biofiltration Swale O & M): Support Vehicle	16	Hours	54	863	1	n/a	863	863

ITEM	QUANTITY	UNITS	UNIT COST	COST	USEFUL LIFE (YEARS)	ANNUALIZED COST	ANNUAL O&M COST	TOTAL ANNUAL COST
Stormwater Pollution Prevention (Biofiltration Swale O & M): Labor	16	Hours	31	491	1	n/a	491	491
Stormwater Pollution Prevention (Biofiltration Swale O & M): Street Sweeping	130	Hours	31	3,986	1	n/a	3,986	3,986
Erosion And Sediment Control (Stabilization BMPs): Initial Site Stabilization	40	Hours	22	863	5	$228	n/a	228
Erosion And Sediment Control (Stabilization BMPs): Heavy Equipment	40	Hours	39	1,554	5	$410	n/a	410
Erosion And Sediment Control (Stabilization BMPs): Heavy Equipment Mobilization	4	Hours	54	216	5	$57	n/a	57
Erosion And Sediment Control (Stabilization BMPs): Hydromulching of Exposed Areas	5	Acres	2,158	10,789	5	$2,846	n/a	2,846
Erosion And Sediment Control (Biofiltration Swale O & M): Mower	3	Hours	43	129	1	n/a	129	129
Erosion And Sediment Control (Biofiltration Swale O & M): Support Vehicle	4	Hours	54	216	1	n/a	216	216
Erosion And Sediment Control (Biofiltration Swale O & M): Labor	4	Hours	31	123	1	n/a	123	123
Erosion And Sediment Control (Biofiltration Swale O & M):Spill Kit	5	Kit	615	3,075	1	3,075	n/a	3,075
Monitoring: PIT Process Water Monitoring	2	Smpl. Pts.	$10,518	21,037	1	n/a	21,037	$21,037
Monitoring: ReadyMix / Concrete Recycling Process Water Monitoring	2	Smpl. Pts.	$11,084	22,169	1	n/a	22,169	$22,169
Monitoring: PIT Stormwater Monitoring	1	Smpl. Pts.	$10,330	10,330	1	n/a	10,330	$10,330
Monitoring: ReadyMix / Concrete Recycling Stormwater Monitoring	2	Smpl. Pts.	$10,896	21,792	1	n/a	21,792	$21,792
Monitoring: Recordkeeping	0	0	$0	0	0	n/a	0	0
Monitoring: DMR Submission	4	hours	$35	141	1	$141	n/a	$141
TOTAL	n/a	n/a	n/a	n/a	n/a	n/a	n/a	$132,330

Table A- 18 Effluent monitoring costs for large active sand & gravel pit with concrete and recycling

Type of Discharge	Pollutant	Cost Per Test	Sampling Labor Cost	Freq.	Freq Units	Total Cost
NAICS 212321 Process Water to Surface	Turbidity	16.50	30.66	24	Yearly	$1,132
NAICS 212321 Process Water to Surface	TSS	16.50	30.66	4	Yearly	$189
NAICS 212321 Process Water to Surface	Oil Sheen	0	30.66	300	Yearly	$9,198
Total Cost of NAICS 212321 Process Water to Surface	n/a	n/a	n/a	n/a	n/a	$10,518
NAICS 212321 Process Water to Ground	Oil Sheen	0	30.66	300	Yearly	$9,198
NAICS 212321 Process Water to Ground	TDS	$16.50	30.66	12	Yearly	$566
Total Cost of NAICS 212321 Process Water to Ground	n/a	n/a	n/a	n/a	n/a	$9,198
NAICS 212321 Stormwater to Surface	Turbidity	16.50	30.66	24	Yearly	$1,132
NAICS 212321 Stormwater to Surface	Oil Sheen	0	30.66	300	Yearly	$9,198
Total Cost of NAICS 212321 Stormwater to Surface	n/a	n/a	n/a	n/a	n/a	$10,330
NAICS 212321 Stormwater to Ground	Oil Sheen	0	30.66	300	Yearly	$9,198
Total Cost	n/a	n/a	n/a	n/a	n/a	$9,198
NAICS 327320 & ECY002 Process Water to Surface	pH	16.50	30.66	12	Yearly	$566
NAICS 327320 & ECY002 Process Water to Surface	Turbidity	16.50	30.66	24	Yearly	$1,132
NAICS 327320 & ECY002 Process Water to Surface	TSS	16.50	30.66	4	Yearly	$189
NAICS 327320 & ECY002 Process Water to Surface	Oil Sheen	0.00	30.66	300	Yearly	$9,198
Total Cost of NAICS 327320 & ECY002 Process Water to Surface	n/a	n/a	n/a	n/a	n/a	$11,084
NAICS 327320 & ECY002 Process Water to Ground	pH	16.50	30.66	12	Yearly	$566
NAICS 327320 & ECY002 Process Water to Ground	Oil Sheen	0.00	30.66	300	Yearly	$9,198
NAICS 327320 & ECY002 Process Water to Ground	TDS	$16.50	30.66	12	Yearly	$566

Type of Discharge	Pollutant	Cost Per Test	Sampling Labor Cost	Freq.	Freq Units	Total Cost
Total Cost of NAICS 327320 & ECY002 Process Water to Ground	n/a	n/a	n/a	n/a	n/a	$10,330
NAICS 327320 & ECY002 Stormwater to Surface	pH	16.50	30.66	12	Yearly	$566
NAICS 327320 & ECY002 Stormwater to Surface	Turbidity	16.50	30.66	24	Yearly	$1,132
NAICS 327320 & ECY002 Stormwater to Surface	Oil Sheen	0.00	30.66	300	Yearly	$9,198
Total Cost	n/a	n/a	n/a	n/a	n/a	$10,896
NAICS 327320 & ECY002 Stormwater to Ground	pH	16.50	30.66	12	Yearly	$566
NAICS 327320 & ECY002 Stormwater to Ground	Oil Sheen	0.00	30.66	300	Yearly	$9,198
Total Cost	n/a	n/a	n/a	n/a	n/a	$9,764

A.11 Small, active hot-mix asphalt facility – new

Assumptions:

- Small asphalt batch plant
- SMP includes site map. Plan must be reviewed yearly, and updated as necessary.
- Must conduct two stormwater inspections per year.
- Vehicle/equipment inspections conducted by drivers
- Not conducting earth moving activities.
- Must write a report on each inspection.
- No commingling of process water and stormwater.
- All Type 3 stormwater is treated by a 200 foot, grass-lined biofiltration swale. Need one such swale per three acres of disturbed area.
- Swale installed after hydromulching of exposed areas.
- Asphalt release agent application area includes large concrete pad sloped to an oil water separator.
- One sample point assumed. Assume monitoring four quarters per year.

- Copies of all monitoring reports, laboratory data, and quality assurance and control documentation must be retained for three to five years. The cost of complying with these requirements is the cost of storing records. This cost is either very low or zero.
- Daily monitoring when discharge occurs. Discharge occurs daily. Six-day work week.
- Must report DMRs every quarter.

Table A- 19 Compliance costs for small active hot mix asphalt operation -- new

ITEM	QUANTITY	UNITS	UNIT COST	COST	USEFUL LIFE (YEARS)	ANNUALIZED COST	ANNUAL O&M COST	TOTAL ANNUAL COST
Site Management Plan: Write SMP	40	Hours	81.51	3,261	1	3,261	n/a	3,261
Inspections: Labor	8	Hours	30.66	245	1	n/a	245	245
Inspections: Write Insp. Rpt.--Labor	2	Hours	30.66	61	1	n/a	61	61
Inspections: Write Insp. Rpt.--Supervision	2	Hours	35.28	71	1	n/a	71	71
Inspections: Vehicle / Equipment Inspections	225	Hours	30.66	6,899	1	n/a	6,899	6,899
Inspections: Sediment / Erosion Control Inspections	0	Hours	30.66	0	1	n/a	0	0
Inspections: Recordkeeping	0	Hours	0	0	0	n/a	0	0
Stormwater Pollution Prevention: Perimeter Berm and Resloping	86	Hours	194	16,702	10	$2,718	n/a	2,718
Stormwater Pollution Prevention (Biofiltration Swale): Grader, 4 Foot Wide	8	Hours	39	311	10	$51	n/a	51
Stormwater Pollution Prevention (Biofiltration Swale): Support Vehicle	8	Hours	54	432	10	$70	n/a	70
Stormwater Pollution Prevention (Biofiltration Swale): Labor	8	Hours	31	245	10	$40	n/a	40
Stormwater Pollution Prevention (Biofiltration Swale): Supervision	2	Hours	35	71	10	$11	n/a	11
Stormwater Pollution Prevention (Biofiltration Swale): Hydromulching of Swale	1	Unit	539	539	10	$88	n/a	88
Stormwater Pollution Prevention (Biofiltration Swale): Spill Kit	1	Kit	615	615	1	$615	n/a	615
Stormwater Pollution Prevention (Biofiltration Swale): Asphalt Release Agent Application Area	1	Unit	4316	4,316	10	$702	n/a	702

ITEM	QUANTITY	UNITS	UNIT COST	COST	USEFUL LIFE (YEARS)	ANNUALIZED COST	ANNUAL O&M COST	TOTAL ANNUAL COST
Stormwater Pollution Prevention (Biofiltration Swale): Oil Water Seperator	1	Unit	53877	53,877	10	$8,768	n/a	8,768
Stormwater Pollution Prevention (Biofiltration Swale): Secondary Containment	1	Unit	710	710	1	$710	n/a	710
Stormwater Pollution Prevention (Biofiltration Swale O & M): Mower	3	Hours	43	129	1	n/a	129	129
Stormwater Pollution Prevention (Biofiltration Swale O & M): Support Vehicle	4	Hours	54	216	1	n/a	216	216
Stormwater Pollution Prevention (Biofiltration Swale O & M): Labor	4	Hours	30.66	123	1	n/a	123	123
Monitoring: Stormwater Monitoring	1	Smpl. Pts.	$10,896	10,896	1	n/a	10,896	$10,896
Monitoring: Recordkeeping	0	0	$0	0	0	n/a	0	0
Monitoring: DMR Submission	4	hours	$35	141	1	$141	n/a	$141
GRAND TOTAL	n/a	n/a	n/a	n/a	n/a	n/a	n/a	$35,815

Table A- 20 Effluent monitoring costs for small active hot mix asphalt operation

Type of Discharge	Pollutant	Cost Per Test	Sampling Labor Cost	Freq.	Freq Units	Total Cost
NAICS 324121 Stormwater to Surface	pH	16.50	30.66	12	Yearly	$566
NAICS 324121 Stormwater to Surface	Turbidity	16.50	30.66	24	Yearly	$1,132
NAICS 324121 Stormwater to Surface	Oil Sheen	0.00	30.66	300	Yearly	$9,198
Total Cost of NAICS 324121 Stormwater to Surface	n/a	n/a	n/a	n/a	n/a	$10,896
NAICS 324121 Process water to Ground	pH	16.50	30.66	12	Yearly	$566
NAICS 324121 Process water to Ground	Oil Sheen	0	30.66	300	Yearly	$9,198
Total Cost of NAICS 324121 Process water to Ground	n/a	n/a	n/a	n/a	n/a	$9,764
NAICS 324121 Stormwater to Ground	pH	16.50	30.66	12	Yearly	$566
NAICS 324121 Stormwater to Ground	Oil Sheen	0	30.66	300	Yearly	$9,198
Total Cost	n/a	n/a	n/a	n/a	n/a	$9,764

A.12 Small, active hot-mix asphalt facility – existing

Assumptions:

- Small asphalt batch plant
- SMP includes site map. Plan must be reviewed yearly, and updated as necessary.
- Must conduct two stormwater inspections per year.
- Vehicle/equipment inspections conducted by drivers
- Not conducting earth moving activities.
- Must write a report on each inspection.
- One sample points assumed. Assume monitoring four quarters per year.
- Copies of all monitoring reports, laboratory data, and quality assurance and control documentation must be retained for three to five years. The cost of complying with these requirements is the cost of storing records. This cost is either very low or zero.
- Daily monitoring when discharge occurs. Discharge occurs daily. Six-day work week.
- Must report DMRs every quarter.

Table A- 21 Compliance costs for small active hot mix asphalt operation -- existing

ITEM	QUANTITY	UNITS	UNIT COST	COST	USEFUL LIFE (YEARS)	ANNUALIZED COST	ANNUAL O&M COST	TOTAL ANNUAL COST
Site Management Plan: Update SMP	4	Hours	81.51	326	1	326	n/a	326
Inspections: Labor	8	Hours	30.66	245	1	n/a	245	245
Inspections: Write Insp. Rpt.--Labor	2	Hours	30.66	61	1	n/a	61	61
Inspections: Write Insp. Rpt.--Supervision	2	Hours	35.28	71	1	n/a	71	71
Inspections: Vehicle / Equipment Inspections	225	Hours	30.66	6,899	1	n/a	6,899	6,899
Inspections: Sediment / Erosion Control Inpsections	0	Hours	30.66	0	1	n/a	0	0
Inspections: Recordkeeping	0	Hours	0	0	0	n/a	0	0

ITEM	QUANTITY	UNITS	UNIT COST	COST	USEFUL LIFE (YEARS)	ANNUALIZED COST	ANNUAL O&M COST	TOTAL ANNUAL COST
Stormwater Pollution Prevention: Spill Kit	1	Kit	615	615	1	615	n/a	615
Stormwater Pollution Prevention (Biofiltration Swale O & M)**:** Mower	3	Hours	43	129	1	n/a	129	129
Stormwater Pollution Prevention (Biofiltration Swale O & M)**:** Support Vehicle	4	Hours	54	216	1	n/a	216	216
Stormwater Pollution Prevention (Biofiltration Swale O & M)**:** Labor	4	Hours	31	123	1	n/a	123	123
Monitoring: Stormwater Monitoring	1	Smpl. Pts.	$10,896	10,896	1	n/a	10,896	$10,896
Monitoring: Recordkeeping	0	0	$0	0	0	n/a	0	0
Monitoring: DMR Submission	4	hours	$35	141	1	$141	n/a	$141
TOTAL	n/a	n/a	n/a	n/a	n/a	n/a	n/a	**$19,722**

Table A- 22 Effluent monitoring costs for small active hot mix asphalt operation

Type of Discharge	Pollutant	Cost Per Test	Sampling Labor Cost	Freq.	Freq Units	Total Cost
NAICS 324121 Stormwater to Surface	pH	16.50	30.66	12	Yearly	$566
NAICS 324121 Stormwater to Surface	Turbidity	16.50	30.66	24	Yearly	$1,132
NAICS 324121 Stormwater to Surface	Oil Sheen	0.00	30.66	300	Yearly	$9,198
Total Cost of NAICS 324121 Stormwater to Surface	n/a	n/a	n/a	n/a	n/a	$10,896
NAICS 324121 Process water to Ground	pH	16.50	30.66	12	Yearly	$566
NAICS 324121 Process water to Ground	Oil Sheen	0	30.66	300	Yearly	$9,198
Total Cost of NAICS 324121 Process water to Ground	n/a	n/a	n/a	n/a	n/a	$9,764
NAICS 324121 Stormwater to Ground	pH	16.50	30.66	12	Yearly	$566
NAICS 324121 Stormwater to Ground	Oil Sheen	0	30.66	300	Yearly	$9,198
Total Cost of NAICS 324121 Stormwater to Ground	n/a	n/a	n/a	n/a	n/a	$9,764

A.13 Large, active hot-mix asphalt facility – new

Assumptions:

- Large asphalt batch plant
- SMP includes site map. Plan must be reviewed yearly, and updated as necessary.
- Must conduct two stormwater inspections per year.
- Vehicle/equipment inspections conducted by drivers
- Not conducting earth moving activities.
- Must write a report on each inspection.
- No commingling of process water and stormwater.
- All Type 3 stormwater is treated by a 200 foot, grass-lined biofiltration swale. Need one such swale per three acres of disturbed area.
- Swale installed after hydromulching of exposed areas.
- Asphalt release agent application area includes large concrete pad sloped to an oil water separator.
- Secondary containment should be an impervious surface, bermed, and covered
- One sample points assumed. Assume monitoring four quarters per year.
- Copies of all monitoring reports, laboratory data, and quality assurance and control documentation must be retained for three to five years. The cost of complying with these requirements is the cost of storing records. This cost is either very low or zero.
- Daily monitoring when discharge occurs. Discharge occurs daily. Six-day work week.
- Must report DMRs every quarter.

Table A- 23 Compliance costs for large active hot mix asphalt operation -- new

ITEM	QUANTITY	UNITS	UNIT COST	COST	USEFUL LIFE (YEARS)	ANNUALIZED COST	ANNUAL O&M COST	TOTAL ANNUAL COST
Site Management Plan: Write SMP	80	Hours	$82	$6,521	1	$6,521	n/a	6,521
Inspections: Labor	16	Hours	$31	$491	1	n/a	491	491
Inspections: Write Insp. Rpt.--Labor	6	Hours	$31	$184	1	n/a	184	184

ITEM	QUANTITY	UNITS	UNIT COST	COST	USEFUL LIFE (YEARS)	ANNUALIZED COST	ANNUAL O&M COST	TOTAL ANNUAL COST
Inspections: Write Insp. Rpt.--Supervision	2	Hours	$35	$71	1	n/a	71	71
Inspections: Vehicle / Equipment Inspections	600	Hours	$31	$18,396	1	n/a	18,396	18,396
Inspections: Sediment / Erosion Control Inspections	0	Hours	$31	$0	1	n/a	0	0
Inspections: Recordkeeping	0	Hours	$0	$0	0	n/a	0	0
Stormwater Pollution Prevention: Perimeter Berm and Resloping	172	Hours	$194	$33,404	10	$5,436	n/a	5,436
Stormwater Pollution Prevention (Biofiltration Swale): Grader, 4 Foot Wide	8	Hours	$39	$311	10	$51	n/a	51
Stormwater Pollution Prevention (Biofiltration Swale): Support Vehicle	8	Hours	$54	$432	10	$70	n/a	70
Stormwater Pollution Prevention (Biofiltration Swale): Labor	8	Hours	$31	$245	10	$40	n/a	40
Stormwater Pollution Prevention (Biofiltration Swale): Supervision	2	Hours	$35	$71	10	$11	n/a	11
Stormwater Pollution Prevention (Biofiltration Swale): Hydromulching of Swale	1	Unit	$539	$539	10	$88	n/a	88
Stormwater Pollution Prevention (Biofiltration Swale): Spill Kit	3	Kit	$615	$1,845	1	$1,845	n/a	1,845
Stormwater Pollution Prevention (Biofiltration Swale): Asphalt Release Agent Application Area	1	Unit	$4,316	$4,316	10	$702	n/a	702
Stormwater Pollution Prevention (Biofiltration Swale): Oil Water Seperator	2	Unit	$53,877	$107,754	10	$17,536	n/a	17,536
Stormwater Pollution Prevention (Biofiltration Swale): Secondary Containment	1	Unit	$1,079	$1,079	1	$1,079	n/a	1,079
Activities (Biofiltration Swale O & M):Mower	3	Hours	$43	129	1		129	129
Activities (Biofiltration Swale O & M):Support Vehicle	4	Hours	$54	216	1	n/a	216	216
Activities (Biofiltration Swale O & M): Labor	4	Hours	$31	123	1	n/a	123	123

ITEM	QUANTITY	UNITS	UNIT COST	COST	USEFUL LIFE (YEARS)	ANNUALIZED COST	ANNUAL O&M COST	TOTAL ANNUAL COST
Monitoring: Stormwater Monitoring	2	Smpl. Pts.	$10,754	21,509	1	n/a	21,509	$21,509
Monitoring: Recordkeeping	0	0	$0	0	0	n/a	0	0
Monitoring: DMR Submission	4	hours	$35	141	1	$141	n/a	$141
GRAND TOTAL	n/a	n/a	n/a	n/a	n/a	n/a	n/a	**$74,639**

Table A- 24 Effluent monitoring costs for large hot mix asphalt operation

Type of Discharge	Pollutant	Cost Per Test	Sampling Labor Cost	Freq.	Freq Units	Total Cost
NAICS 324121 Stormwater to Surface	pH	16.50	30.66	12	Yearly	$424
NAICS 324121 Stormwater to Surface	Turbidity	16.50	30.66	24	Yearly	$1,132
NAICS 324121 Stormwater to Surface	Oil Sheen	0	30.66	300	Yearly	$9,198
Total Cost of NAICS 324121 Stormwater to Surface	n/a	n/a	n/a	n/a	n/a	$10,754
NAICS 324121 Process water to Ground	pH	16.50	30.66	12	Yearly	$566
NAICS 324121 Process water to Ground	Oil Sheen	0	30.66	300	Yearly	$9,198
Total Cost of NAICS 324121 Process water to Ground	n/a	n/a	n/a	n/a	n/a	$9,764
NAICS 324121 Stormwater to Ground	pH	16.50	30.66	12	Yearly	$566
NAICS 324121 Stormwater to Ground	Oil Sheen	0	30.66	300	Yearly	$9,198
Total Cost of NAICS 324121 Stormwater to Ground	n/a	n/a	n/a	n/a	n/a	$9,764

A.14 Large, active hot-mix asphalt facility – existing

Assumptions:

- Large asphalt batch plant
- SMP includes site map. Plan must be reviewed yearly, and updated as necessary.
- Must conduct two stormwater inspections per year.

- Vehicle/equipment inspections conducted by drivers
- Not conducting earth moving activities.
- Must write a report on each inspection.
- One sample points assumed. Assume monitoring four quarters per year.
- Copies of all monitoring reports, laboratory data, and quality assurance and control documentation must be retained for three to five years. The cost of complying with these requirements is the cost of storing records. This cost is either very low or zero.
- Daily monitoring when discharge occurs. Discharge occurs daily. Six-day work week.
- Must report DMRs every quarter.

Table A- 25 Compliance costs for large active hot mix asphalt operation -- existing

ITEM	QUANTITY	UNITS	UNIT COST	COST	USEFUL LIFE (YEARS)	ANNUALIZED COST	ANNUAL O&M COST	TOTAL ANNUAL COST
Site Management Plan: Update SMP	8	Hours	81.51	652	1	$652	n/a	652
Inspections: Labor	16	Hours	30.66	491	1	n/a	491	491
Inspections: Write Insp. Rpt.--Labor	6	Hours	30.66	184	1	n/a	184	184
Inspections: Write Insp. Rpt.--Supervision	2	Hours	35.28	71	1	n/a	71	71
Inspections: Vehicle / Equipment Inspections	600	Hours	30.66	18,396	1	n/a	18,396	18,396
Inspections: Sediment / Erosion Control Inspections	0	Hours	30.66	0	1	n/a	0	0
Inspections: Recordkeeping	0	Hours	0	0	0	n/a	0	0
Stormwater Pollution Prevention: Spill Kit	3	Kit	615	1,845	1	$1,845	n/a	1,845
Activities (Biofiltration Swale O & M): Mower	3	Hours	43	129	1	n/a	129	129
Activities (Biofiltration Swale O & M): Support Vehicle	4	Hours	54	216	1	n/a	216	216
Activities (Biofiltration Swale O & M): Labor	4	Hours	31	123	1	n/a	123	123
Monitoring: Stormwater Monitoring	2	Smpl. Pts.	$10,754	21,509	1	n/a	21,509	$21,509
Monitoring: Recordkeeping	0	0	$0	0	0	n/a	0	0

ITEM	QUANTITY	UNITS	UNIT COST	COST	USEFUL LIFE (YEARS)	ANNUALIZED COST	ANNUAL O&M COST	TOTAL ANNUAL COST
Monitoring: DMR Submission	4	hours	$35	141	1	$141	n/a	$141
GRAND TOTAL	n/a	n/a	n/a	n/a	n/a	n/a	n/a	**$43,756**

Table A- 26 Effluent monitoring costs for large active hot mix asphalt operation

Type of Discharge	Pollutant	Cost Per Test	Sampling Labor Cost	Freq.	Freq Units	Total Cost
NAICS 324121 Stormwater to Surface	pH	16.50	30.66	12	Yearly	$424
NAICS 324121 Stormwater to Surface	Turbidity	16.50	30.66	24	Yearly	$1,132
NAICS 324121 Stormwater to Surface	Oil Sheen	0	30.66	300	Yearly	$9,198
Total Cost of NAICS 324121 Stormwater to Surface	n/a	n/a	n/a	n/a	n/a	$10,754
NAICS 324121 Process water to Ground	pH	16.50	30.66	12	Yearly	$566
NAICS 324121 Process water to Ground	Oil Sheen	0	30.66	300	Yearly	$9,198
Total Cost of NAICS 324121 Process water to Ground	n/a	n/a	n/a	n/a	n/a	$9,764
NAICS 324121 Stormwater to Ground	pH	16.50	30.66	12	Yearly	$566
NAICS 324121 Stormwater to Ground	Oil Sheen	0	30.66	300	Yearly	$9,198
Total Cost of NAICS 324121 Stormwater to Ground	n/a	n/a	n/a	n/a	n/a	$9,764

References

RCW 34.05.272 requires Ecology to categorize sources of information used in significant agency actions made in the Water Quality Program.

Independent peer review

Review is overseen by an independent third party.

n/a

Internal peer review

Review by staff internal to Ecology.

Washington State Department of Ecology (1994). Small Business Economic Impact Statement: General Permit for Sand and Gravel Operations, Rock Quarries, and Similar Mining Facilities, Including Stockpiles of Mined Materials, Concrete Batch Operations, and Asphalt Batch Operations. April, 1994. Publication no. 94-43

External peer review

Review by persons that are external to and selected by Ecology.

n/a

Open review

Documented open public review process that is not limited to invited organizations or individuals.

US Census Bureau (2025). North American Industry Classification System (NAICS) 2022. North American Industry Classification System (NAICS) U.S. Census Bureau

Legal and policy documents

Documents related to the legal framework for the significant agency action, including but not limited to: federal and state statutes, court and hearings board decisions, federal and state administrative rules and regulations, and policy and regulatory documents adopted by local governments.

40 CFR 122.44

Chapter 173-200 WAC: Water quality standards for groundwaters of the state of Washington.

Chapter 173-201A WAC: Water quality standards for surface waters of the state of Washington.

Chapter 173-204 WAC: Sediment management standards.

Chapter 173-224 WAC: Water quality permit fees.

Chapter 173-226 WAC: Waste discharge general permit program.

Chapter 90.48 RCW: Water Pollution Control.

Independent data

Data from primary research, monitoring activities, or other sources, but that has not been incorporated as part of documents reviewed under independent, internal, or external peer review.

Everett Environmental Laboratory (2020). 2018 Everett Environmental Laboratory Price List.

Grainger (2020). Oil spill kits. Drum.

Manchester Environmental Laboratory Price List FY 2025 (2025).

Permit and Reporting Information System (PARIS) (2025). Ecology database. http://www.ecy.wa.gov/PROgrams/wq/permits/paris/index.html

US Bureau of Labor Statistics (2024). May 2024 State Occupational Employment and Wage Estimates for Washington. https://www.bls.gov/oes/current/oes_wa.htm

US Bureau of Labor Statistics (2025). Consumer Price Index.

Xerxes (2024). Oil/Water Separator Price List.

Records of the best professional judgment of Ecology employees or other individuals.

Other: Sources of information that do not fit into other categories.