

THE CITY AND BOROUGH OF JUNEAU
WASTEWATER UTILITY

Monofill Permit
Permit No. SWZA013-22

Prepared by:

City and Borough of Juneau
Department of Engineering and Public Works
Utilities Division-Wastewater
2009 Radcliffe Road
Juneau, AK 99801

&

Alaska Department of Environmental Conservation
Division of Environmental Health
Solid Waste Program
410 Willoughby Avenue, Suite 303
Juneau, AK 99801

Authorization Date:
10 May 2017

Expires On:
23 April 2022



ADEC Authorization Letter



THE STATE
of **ALASKA**
GOVERNOR BILL WALKER

Department of Environmental
Conservation

DIVISION OF ENVIRONMENTAL HEALTH
Solid Waste Program

410 Willoughby Avenue, Suite 303
P.O. Box 111800
Juneau, Alaska 99811-1800
Main: 907.465.5318
Fax: 907.465.5362

May 10, 2017

Certified Mail #7016 2140 0000 1907 3003
Return Receipt Requested

Samantha Stoughtenger, Utilities Superintendent
City and Borough of Juneau
2009 Radcliffe Road
Juneau, AK 99801

RE: City and Borough of Juneau, Juneau-Douglas Wastewater Treatment Plant Sewage Solids
Disposal Site, Solid Waste Permit No. **SWZA013-22**

Dear Ms. Stoughtenger:

The Alaska Department of Environmental Conservation (ADEC) has completed its evaluation of your permit renewal application materials originally dated March 22, 2017 and subsequently updated on April 28, 2017 for a sewage solids monofill that receives sewage solids from a Vactor truck pond at the Juneau-Douglas Wastewater Treatment Plan in Juneau, Alaska. Please review the conditions and stipulations in the permit and ensure that they are understood. This permit is being issued in accordance with Alaska Statute (AS) 46.03; Title 18, Chapter 15 of the Alaska Administrative Code (18 AAC 15); and the Solid Waste Regulations (18 AAC 60).

Any person who disagrees with this decision may request an adjudicatory hearing in accordance with 18 AAC 15.195 - 18 AAC 15.340 or an informal review by the Division Director in accordance with 18 AAC 15.185. **Informal review requests** must be delivered to the Division Director, Alaska Department of Environmental Conservation, 555 Cordova Street, Anchorage, AK 99501 within 15 days of the permit decision. **Adjudicatory hearing requests** must be delivered to the Commissioner of the Department of Environmental Conservation, 410 Willoughby Avenue, Suite 303, Juneau, Alaska 99801, within 30 days of the permit decision. If a hearing is not requested within 30 days, the right to appeal is waived. More information regarding submitting a request for an informal review or adjudicatory hearing may be found at www.dec.state.ak.us/commish/ReviewGuidance.htm. Even if an adjudicatory hearing has been requested and granted, all permit conditions remain in effect unless a stay has been granted.

Please contact Sandra Woods at (907)465-5318 or by email at sandra.woods@alaska.gov if you have any questions or require any additional information.

Sincerely,

A handwritten signature in blue ink that reads "Douglas Buteyn".

Douglas Buteyn
Northern/Southeastern Regional Solid Waste Manager

Enclosure: Permit #SWZA013-22, expiring on **April 23, 2022**

STATE OF ALASKA
DEPARTMENT OF ENVIRONMENTAL CONSERVATION
410 Willoughby Avenue
Juneau, AK 99811

SOLID WASTE DISPOSAL PERMIT

Permit No. **SWZA013-22**

Date Effective: May 10, 2017
Date Expires: April 23, 2022

The Alaska Department of Environmental Conservation (ADEC), under authority of AS 46.03 and 18 AAC 60, issues a solid waste disposal permit to:

City and Borough of Juneau
Samantha Stoughtenger, Utilities Superintendent
2009 Radcliff Road
Juneau, Alaska 99801

and designated representatives for the management and operation of a sewage solids monofill that receives sewage solids from a Vactor truck pond at the Juneau-Douglas Wastewater Treatment Plant in Juneau, Alaska.

The landfill consists of an area of approximately two acres and is located at 1540 Thane Road, Juneau, Alaska. The MRTS is Section 25, Range 67E, Township 41S, Copper River Meridian.

The permit holder shall manage and operate the facility in accordance with:

- 18 AAC 60, and
- permit application materials including the Operation Plan, Monitoring Plan and Closure Plan dated March 22, 2017, and updated on April 28, 2017.

In addition, the following permit conditions are required:

Specific Conditions

1. The permittee shall dispose of only material removed from the Vactor truck pond at the monofill dedicated for sewage solids. The permittee shall prohibit all other wastes in the monofill.
2. The permittee will ensure that all settled sewage solids removed from the Vactor truck settlement pond will be treated and disposed of in accordance with the Operation Plan and the Monitoring Plan dated April 28, 2017.
3. Beginning in the fourth quarter (October-December) of 2017, the permittee shall implement a quarterly methane monitoring program to ensure that the concentration of methane gas generated by the facility does not exceed (1) 25 percent of the lower explosive limit for methane in any facility structures less than 500 feet from the monofill property boundary, excluding gas control or recovery system components, and (2) the lower explosive limit for methane at the facility property boundary. If methane gas levels exceeding the limits set in this stipulation are

detected, the permittee shall immediately notify the department by telephone and in writing, and shall take all necessary steps to reduce or dissipate the concentrations of methane to ensure the public health, safety, and welfare. The permittee shall implement a long-term remediation plan for the methane gas releases, place a copy of the plan in the operating record, and submit written notification to the department that the plan has been implemented within 60 days of an exceedance of the limits set in this stipulation.

General Conditions

1. Access and inspection - The Permittee shall allow the Commissioner or his representative access to the permitted facilities at reasonable times to conduct scheduled or unscheduled inspections or tests to determine compliance with this permit, State laws, and regulations.
2. Information access - Except for information relating to confidential processes or methods of manufacture, all records and reports submitted in accordance with the terms of this permit shall be available for public inspection at the State of Alaska, Department of Environmental Conservation, 410 Willoughby Avenue, Juneau, AK 99811.
3. Civil and criminal liability - Nothing in this permit shall relieve the Permittee from civil or criminal penalties for noncompliance, whether or not such noncompliance is due to factors beyond his control, including, but not limited to, accidents, equipment breakdowns, or labor disputes.
4. Availability - The Permittee shall post or maintain a copy of this permit available to the public at the disposal facility.
5. Adverse impact - The Permittee shall take all necessary means to minimize any adverse impacts to the receiving waters or lands resulting from noncompliance with any limitation specified in this permit, including any additional monitoring needed to determine the nature and impact of the noncomplying activity. The Permittee shall clean up and restore all areas adversely impacted by the noncompliance.
6. Cultural or paleontological resources - Should cultural or paleontological resources be discovered as a result of this activity, work which would disturb such resources is to be stopped, and the State Historic Preservation Office, Division of Parks and Outdoor Recreation, Department of Natural Resources, is to be notified immediately (907-269-8721).
7. Applications for renewal - In accordance with 18 AAC 15.100(d), applications for renewal or amendment of this permit must be made no later than 30 days before the expiration date of the permit or the planned effective date of the amendment.
8. Other legal obligations - The requirements, duties, and obligations set forth in this permit are in addition to any requirements, duties, or obligations contained in any permit that the Alaska Department of Environmental Conservation or the U.S. Environmental Protection Agency has issued or may issue to the Permittee. This permit does not relieve the Permittee from the duty to obtain any and all necessary permits and to comply with the requirements contained in any such permit or with applicable state and federal laws and regulations. All activities conducted by the Permittee pursuant to the terms of this permit and all plans implemented by the Permittee pursuant to the terms of this permit shall comply with all applicable state and federal laws and regulations.

9. Pollution prevention - In order to prevent and minimize present and future pollution, when making management decisions that affect waste generation, the Permittee shall consider the following order of priority options: waste source reduction; recycling of waste; waste treatment; and waste disposal.

This permit expires on **April 23, 2022** and may be revoked or amended in accordance with 18 AAC 60.260. The permit can be renewed if the facility will operate beyond this date. To avoid expiration of this permit, a renewal application must be submitted to ADEC at least 30 days before the expiration date, as set forth in 18 AAC 15.110.



Douglas Buteyn
Northern/Southeastern Regional Solid Waste Manager

Monofill Permit Application



Sewage Solids Monofill Permit Application
 Alaska Department of Environmental Conservation
 Solid Waste Program

DEC Office Only:
 Monofill Name: _____
 Authorization #: _____

Instructions:

This application is for a new permit or a permit renewal for a Sewage Solids Monofill.

If the required information is not applicable, please explain why. If it is included in a previous application AND it has not changed since submitted, you must provide a specific reference or citation to the document and page where it can be found.

For new facilities and lateral expansions, prepare a draft application with a list of any questions, and schedule a meeting with the local DEC office.

Section 1. General Information

Facility Name: Juneau-Douglas Wastewater Treatment Plant

Location (Community Name): Juneau

Street Address (if applicable): 1540 Thane Road, Juneau, AK 98901

Legal Description:

ATS 556 Tract A, with the exemption of parcel tax I.D. 1C110K000041 and parcel tax I.D. 1C1100K000042

General Description:

The Juneau-Douglas Wastewater Treatment Plant and the sewage solids monofill are location approximately 1 mile south of downtown Juneau on Thane Road.

Latitude: 58.288056

Longitude: 134.386944

Meridian: Copper River

Range: 67E

Township: 41S

Section: 25

Section 2. Fees

A check or money order for the appropriate fees (listed in 18 AAC 60.700 Table I-3) must be submitted with the permit application. If not included, the application will be returned to the applicant.

1. Submit payment for the application review fee, if required. The application review fee is only required for an initial application, not for renewals.
2. Submit payment to cover waiver request fees, if applicable. Each waiver request requires a separate fee.

This application is for an:

Existing Monofill

New Monofill

Section 3. Cover Letter and Certifications

Submit a cover letter with the following information and signature.
 [18 AAC 60.210(a); 18 AAC 60.210(b)(1); 18 AAC 60.210(b)(2)]

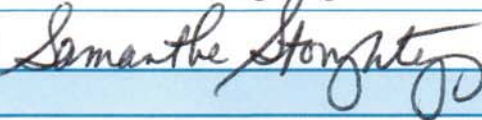
1. A statement indicating you wish to obtain a permit for a sewage solids monofill.
2. Evidence showing the proposed facility meets the requirements for a sewage solids monofill.
3. A brief general description of the site topography, geology, climate, surface hydrology and groundwater hydrology.
4. A statement that you are aware of all applicable local ordinances and zoning requirements.
5. The applicant must submit a **signed copy** of the application cover letter.
6. The applicant must submit a **signed copy** of the following statement, which may be added exactly as shown in the box below to the cover letter. As an alternative, the applicant may sign this sheet and submit it as an attachment to the cover letter.

I certify under penalty of perjury, that all of the information and exhibits in this cover letter and application are true, accurate, and complete.

Printed Name: Samantha Stoughtenger

Title: Utilities Superintendent

Signature:



Date: 03/22/2017

All applications must be signed as follows per 18 AAC 15.030:

- **Corporations:** A principal executive officer, an officer that is no lower than the level of vice president, or a duly authorized representative who is responsible for the overall management of the project or operation.
- **Municipal, state, federal, or other public entity:** A principal executive officer, ranking elected official, or duly authorized employee.
- **Partnerships:** A general partner.
- **Sole proprietorship:** The proprietor.



**ENGINEERING & PUBLIC WORKS DEPARTMENT
UTILITIES DIVISION**

2009 Radcliffe Road, Juneau, AK 99801
907.586.0393 / 907.789.1681 <fax>
Samantha.Stoughtenger@juneau.org

22 March 2017

Alaska Department of Environmental Conservation
Environmental Health Division-Solid Waste Program
Sandra Woods, Municipal Landfill Specialist
410 Willoughby Avenue
Juneau, AK 99801

RE: CBJ Wastewater Utility Sewage Solids Monofill Permit Renewal (SWZA013-17)

Hello Ms. Woods:

The City and Borough of Juneau (CBJ) Wastewater Utility is applying to renew its solid waste permit at the Juneau-Douglas Wastewater Treatment Plant (JDTP). The existing permit, SWZA013-17, includes the biosolids monofill that receives untreated biosolids and debris from the CBJ Collections system via the vector truck.

The JDTP, including the monofill site, are located at 1540 Thane Road, approximately one mile from downtown Juneau. It is Section 25, R67 E, T41 S, Copper River Meridian; Lat. 58°17'2"N, Long 134°23'13"W.

The facilities are built on the tailings from previous mining operations in the Juneau area. Soil borings conducted in 1989 indicated the depth of the tailings to be about 100 feet and mostly comprised of sand and silt. The average elevation of the site is about 35 feet above mean low water. Groundwater levels vary with the tides in Gastineau Channel. At the time of the subsurface exploration, tide levels were measured about 22 feet above mean low water. There are no surface water runoff streams at the JDTP site. Juneau's climate is consistent with Southeast Alaska's coastal weather patterns. Temperatures range from winter lows of -15°F to historical summer highs of 90°F. Precipitation averages 64 inches per year.

This permit application consists of all eleven sections of the ADEC Sewage Solids Monofill Permit application completed in-full, including two waiver requests for groundwater and explosive gas monitoring. The CBJ acknowledges all applicable local ordinances and zoning requirements for operating the monofill.

Kindest Regards,

Samantha Stoughtenger
Utilities Superintendent

cc: Roger K. Healy, CBJ Engineering and Public Works Director
Randall Brown, CBJ Acting WWT Supervisor
Rico Tempel, CBJ WWT Senior Operator

Section 4. Contact Information [18.AAC 60.210(b)(2)]

Applicant: City and Borough of Juneau		Contact Name: Samantha Stoughtenger	
Address: 2009 Radcliffe Road		City: Juneau	State: AK Zip: 99801
Email: samantha.stoughtenger@juneau.org		Phone: (907) 586-0393	
Type of Entity: <input type="checkbox"/> Corporation <input type="checkbox"/> Individual		<input checked="" type="checkbox"/> Municipality <input type="checkbox"/> Other:	
State of Incorporation or Registration: N/A		Alaska Business License Number: N/A	
IRS Tax ID Number: 92-0038816			
Facility Owner: City and Borough of Juneau		Contact Name: Samantha Stoughtenger	
Address: 2009 Radcliffe Road		City: Juneau	State: AK Zip: 99801
Email: samantha.stoughtenger@juneau.org		Phone: (907) 586-0393	
Facility Operator: City and Borough of Juneau		Contact Name: Randall Brown	
Address: 2009 Radcliffe Road		City: Juneau	State: AK Zip: 99801
Email: randall.brown@juneau.org		Phone: (907) 586-0393	
Agent/Consultant: City and Borough of Juneau		Contact Name: Samantha Stoughtenger	
Address: 2009 Radcliffe Road		City: Juneau	State: AK Zip: 99801
Email: samantha.stoughtenger@juneau.org		Phone: (907) 586-0393	
Landowner: City and Borough of Juneau		Contact Name: Samantha Stoughtenger	
Address: 2009 Radcliffe Road		City: Juneau	State: AK Zip: 99801
Email: samantha.stoughtenger@juneau.org		Phone: (907) 586-0393	

Section 5. Location Information [18 AAC 60.450(b)]

1.	Property Ownership and Location Information [18 AAC 60.210(b)(3)(A); 18 AAC 60.210(b)(7)]
	<p>a. Attach a copy of the deed or another legal document that identifies the landowner.</p> <p>Title of the Attachment: See attached land patent.</p>
	<p>b. If the applicant is not the landowner, attach a written and notarized statement signed by the landowner showing that the landowner consents to the monofill, and agrees to the placement of a notation on the deed, or a copy of any lease agreement that clearly states the same.</p> <p>Title of the Attachment: N/A</p>
2.	Surface Water Information [18 AAC 60.210(b)(3); 18 AAC 60.225; 18 AAC 60.410]
	<p>a. Discuss the potential for surface water run-on into the monofill:</p> <p>The JDTP site is essentially flat. The site around the monofill is graded so that any surface water flow from the monofill or surrounding area will be directed to the vector truck pond where it can be pumped to the wastewater treatment plant for treatment and discharge.</p>
	<p>b. Discuss the potential for sediment carried by runoff from the monofill to impact nearby surface water:</p> <p>N/A</p>
	<p>c. If the monofill is located in a floodplain, attach documentation to demonstrate the monofill:</p> <ul style="list-style-type: none"> • will not restrict the flow of the flood or reduce the temporary storage capacity of the floodplain, and • is designed to protect against washout of the solid waste. <p>Title of the Attachment: N/A</p>
3.	Groundwater Information [18 AAC 60.217; 18 AAC 60.820(a)(8)]
	<p>a. Attach information documenting the highest measured level of groundwater under the monofill area. The base of any new unlined cells or lateral expansions may not be located closer than 10 feet above groundwater unless constructed two feet or more above ground surface.</p> <p>Title of the Attachment: See attached soils report</p>
	<p>b. Depth to the seasonal high groundwater table beneath the site (in feet) 13</p>
	<p>c. Annual precipitation (in inches) 64</p>
	<p>d. Source used to determine annual precipitation National Weather Service/NOAA</p>

4.	<p>Permafrost Information [18 AAC 60.210(b)(3)(B); 18 AAC 60.227]</p>
	<p>a. If the monofill is located on permafrost, explain why there is no practical alternative to the site chosen.</p> <p>N/A</p>
	<p>b. If the monofill is located in an area of discontinuous permafrost, provide a summary of what is known about the permafrost (e.g. total depth, depth of active zone, areal extent, temperature, etc.).</p> <p>N/A</p>
5.	<p>Maps Attach maps and/or aerial photographs as needed to show the following. You may submit maps that show more than one of the required items. For example, one map can show property boundaries, nearest airport, wetland and surface water locations, etc. [18 AAC 60.040; 18 AAC 60.210(b)(3); 18 AAC 60.410]</p>
	<p>a. Location of the monofill property boundaries.</p>
	<p>b. Location of surface water bodies and streams within 200 feet of the monofill property boundaries.</p>
	<p>c. Location of the known or inferred boundaries of permafrost or discontinuous permafrost within 500 feet of the monofill property boundaries.</p>
	<p>d. Location of all drinking water wells within a half mile. There should be no wells within 500 feet of the monofill property boundaries.</p>
	<p>e. Location of the boundary of any 100-year floodplain in the area.</p>
	<p>f. Location of any documented earthquake faults, unstable areas, and wetland areas within 200 feet of the monofill property boundary.</p>
6.	<p>Map Sources [18 AAC 60.210(b)(2)]</p>
	<p>a. List the sources of information used to compile the maps in item 5, including a complete citation.</p> <p>1. Aerial Photo of Juneau-Douglas Treatment Plant Property Boundary. 2013. City and Borough of Juneau Community Development Department, GIS Division.</p>

Post-It [®] Fax Note	7871	Date	# of pages
To	Sam Kelly	From	Steve Hillman
Co./Dept.		Co.	COJ
Phone #		Phone #	586-5252
Fax #		Fax #	

State

Patent

Tidelands No. 224

Know All Men By These Presents that the State of Alaska, pursuant to A.S. 38.05.020, as amended and the rules and regulations promulgated thereunder, and in consideration of:

A Municipal Preference Right

and other good and valuable consideration, does hereby grant to:

CITY OF JUNEAU

155 South Seward Street

Juneau, Alaska

their heirs and assigns, those Tidelands lying seaward of the mean high tide line in Gastineau Channel, State of Alaska, described as follows:

Known as A.T.S. No. 556: TRACT A
 Beginning at Cor. No. 1, from whence Cor. No. 29, ATS No. 201 bears N. 22° 00' 00" W., 250.27 ft. distant. Thence, from Cor. No. 1, by metes and bounds, S. 22° 00' 00" E., 354.73 ft., to Cor. No. 2; S. 37° 35' 00" E., 970.00 ft., to Cor. No. 3; S. 62° 10' 00" E., 1,021.74 ft., to Cor. No. 4; S. 80° 50' 00" E., 200.00 ft., to Cor. No. 5; N. 25° 35' 55" E., 1,245.52 ft., to Cor. No. 6; S. 36° 27' 20" E., 263.98 ft., to Cor. No. 7; S. 46° 42' 20" E., 223.78 ft., to Cor. No. 8; S. 61° 35' 20" E., 136.57 ft., to Cor. No. 9; S. 47° 57' 20" E., 203.54 ft., to Cor. No. 10; S. 55° 16' 20" E., 144.17 ft., to Cor. No. 11; S. 37° 24' 20" E., 265.62 ft., to Cor. No. 12; S. 62° 59' 00" E., 181.67 ft., to Cor. No. 13; S. 58° 33' 20" E., 200.58 ft., to Cor. No. 14; S. 50° 04' 20" E., 197.98 ft., to Cor. No. 15; S. 26° 16' 24" E., 97.56 ft., to Cor. No. 16; S. 42° 30' 54" E., 92.61 ft., to Cor. No. 17; S. 28° 37' 50" E., 187.01 ft., to Cor. No. 18; S. 51° 17' 50" E., 206.57 ft., to Cor. No. 19; S. 64° 56' 50" E., 227.45 ft., to Cor. No. 20; S. 36° 35' 20" E., 85.87 ft., to Cor. No. 21; S. 20° 33' 50" E., 99.64 ft., to Cor. No. 22; S. 33° 47' 50" E., 146.28 ft., to Cor. No. 23; S. 54° 07' 20" E., 196.41 ft., to Cor. No. 24; S. 75° 55' 50" E., 199.85 ft., to Cor. No. 25; N. 89° 22' 10" E., 149.72 ft., to Cor. No. 26; S. 61° 24' 50" E., 87.54 ft., to Cor. No. 27; N. 33° 12' 30" E., 13.98 ft., to Cor. No. 28; S. 47° 44' 25" E., 297.64 ft., to Cor. No. 29; S. 42° 32' 25" E., 130.70 ft., to Cor. No. 30; S. 50° 45' 25" E., 181.73 ft., to Cor. No. 31; S. 34° 50' 25" E., 140.01 ft., to Cor. No. 32; S. 57° 17' 25" E., 193.69 ft., to Cor. No. 33; S. 39° 32' 25" E., 147.94 ft., to Cor. No. 34; S. 72° 22' 37" W., 1,267.45 ft., to Cor. No. 35; N. 46° 29' 12" W., 2,372.44 ft., to Cor. No. 36; N. 80° 50' 42" W., 1,470.74 ft., to Cor. No. 37; N. 46° 19' 31" W., 1,956.38 ft., to Cor. No. 38; N. 4° 39' 32" W., 565.32 ft., to Cor. No. 1, the point of beginning, containing in all 105.753 acres, more or less. Latitude 58° 17' 23" N. Longitude 134° 23' 43" W. at Cor. No. 1.

STATE OF ALASKA PATENT

TIDELANDS NO. 224

87 446
 Journal Recording DLT

Known as A.T.S. No. 556; TRACT B

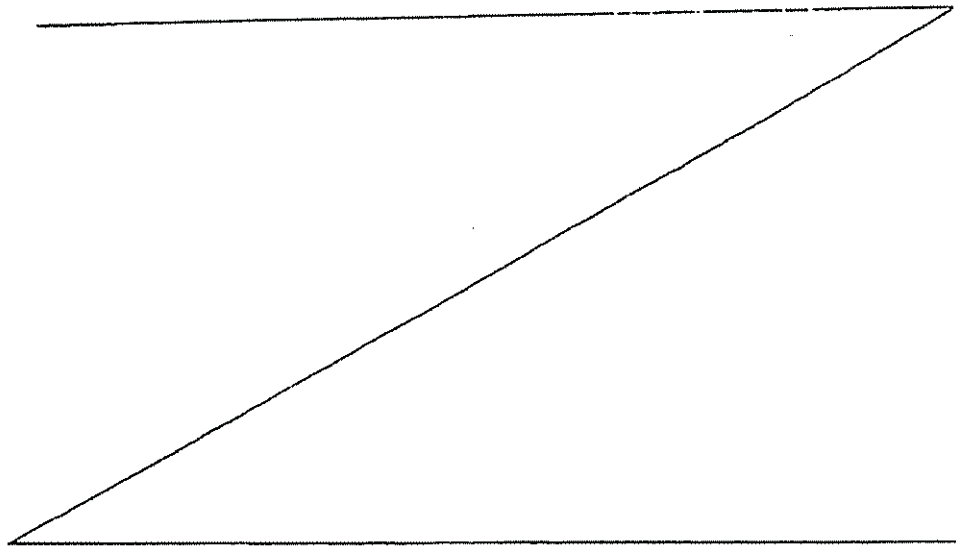
Beginning at Cor. No. 1, identical with Cor. No. 1, M.C., USS 2111. Thence, from Cor. No. 1, by metes and bounds, N. 28° 41' 11" W., 244.47 ft., to Cor. No. 2; N. 52° 08' 00" W., 146.67 ft., to Cor. No. 3; N. 52° 00' 51" W., 213.87 ft., to Cor. No. 4; N. 65° 38' 51" W., 365.71 ft., to Cor. No. 5; N. 46° 28' 51" W., 158.42 ft., to Cor. No. 6; N. 38° 01' 56" W., 823.02 ft., to Cor. No. 7; N. 40° 42' 56" W., 135.53 ft., to Cor. No. 8; N. 49° 01' 56" W., 208.24 ft., to Cor. No. 9; N. 50° 36' 45" W., 206.39 ft., to Cor. No. 10; N. 43° 40' 45" W., 225.58 ft., to Cor. No. 11; N. 43° 48' 45" W., 69.46 ft., to Cor. No. 12; N. 56° 51' 45" W., 95.92 ft., to Cor. No. 13; S. 89° 43' 00" E., 35.64 ft., to Cor. No. 14; N. 53° 51' 05" W., 346.36 ft., to Cor. No. 15; S. 46° 28' 00" W., 65.34 ft., to Cor. No. 16; N. 43° 13' 00" W., 1,498.46 ft., to Cor. No. 17; N. 30° 28' 50" W., 930.24 ft., to Cor. No. 18; N. 51° 40' 00" E., 86.84 ft., to Cor. No. 19; N. 74° 03' 30" W., 189.25 ft., to Cor. No. 20; S. 54° 37' 00" W., 106.22 ft., to Cor. No. 21; S. 14° 59' 00" E., 37.07 ft., to Cor. No. 22; S. 46° 12' 00" E., 31.61 ft., to Cor. No. 23; S. 28° 12' 00" E., 8.68 ft., to Cor. No. 24; N. 60° 58' 50" W., 465.45 ft., to Cor. No. 25; S. 72° 31' 10" W., 78.57 ft., to Cor. No. 26; N. 50° 20' 30" W., 96.36 ft., to Cor. No. 27; N. 34° 19' 30" E., 131.34 ft., to Cor. No. 28; N. 20° 19' 30" E., 165.00 ft., to Cor. No. 29; N. 50° 20' 30" W., 108.96 ft., to Cor. No. 30; N. 17° 12' 40" W., 122.16 ft., to Cor. No. 31; S. 52° 54' 26" E., 338.56 ft., to Cor. No. 32; S. 34° 02' 15" W., 299.84 ft., to Cor. No. 33; thence in an easterly direction along a circular curve with a radius of 298.06 ft., a chord bearing and distance of N. 78° 18' 55" E., 263.60 ft., to Cor. No. 34; N. 52° 04' 16" E., 104.71 ft., to Cor. No. 35; S. 52° 54' 26" E., 49.67 ft., to Cor. No. 36; S. 47° 24' 47" E., 5,837.84 ft., to Cor. No. 37; S. 30° 08' 58" W., 571.00 ft., to Cor. No. 1, the point of beginning, containing in all 64.682 acres, more or less. Latitude 58° 17' 21" N. Longitude 134° 24' 35" W. at Cor. No. 1.

EXCEPTION TO A.T.S. NO. 556, TRACT B

Beginning at Cor. No. 16, ATS 556, Tract B, identical with Cor. No. 3, M.C., U.S.M.S. 173; thence N. 43° 13' 00" W., 196.70 ft., to Cor. No. 1, the true point of beginning; thence, by metes and bounds, N. 43° 13' 00" W., 71.90 ft., to Cor. No. 2; N. 47° 23' 40" E., 71.56 ft., to Cor. No. 3; S. 43° 00' 00" E., 70.00 ft., to Cor. No. 4; S. 45° 51' 45" W., 71.31 ft., to Cor. No. 1, the point of beginning, containing in all 0.116 acres, more or less.

AREA

Tract A	105.753 Acres
Tract B	64.682 Acres
Total	170.435 Acres
Exception	0.116 Acres
Net Area	170.319 Acres





Deed Book 37 Page 447
Juneau Recording Dist.

RECORDED - FILED

REC. DIST.

DATE 1-9-1968

NAME L. S. ...

EXAMINED BY [Signature]

ADDRESS [Signature]

Section _____, Township 41 South, Range 67-68 East, CR Meridian
 according to the official plat of survey thereof, on file and of record with the Division of Lands and recorded in
 Plat No. 512, Serial No. 67-2463
 Book _____ Page _____ of the official records of the Juneau Recording Precinct, Juneau, Alaska

The Grantor, Alaska, expressly reserves, out of the grant hereby made, unto itself, its lessees, successors, and assigns forever, all oils, gases, coal, ores, minerals, fissionable materials, and fossils of every name, kind or description, and which may be in or upon said lands above described, or any part thereof, and the right to explore the same for such oils, gases, coal, ores, minerals, fissionable materials and fossils of every name, kind or description, and which may be in or upon said lands above described, or any part thereof, and the right to explore the same for such oils, gases, coal, ores, minerals, fissionable materials and fossils, and it also hereby expressly saves and reserves out of the grant hereby made, unto itself, its lessees, successors and assigns forever, the right to enter by itself, its or their agents, attorneys, and servants upon said lands, or any part or parts thereof, at any and all times, for the purpose of opening, developing, drilling and working mines or wells on these or other lands, and taking out and removing therefrom all such oils, gases, coal, ores, minerals, fissionable materials and fossils, and to that end it further expressly reserves out of the grant hereby made, unto itself, its lessees, successors, and assigns forever, the right by its or their agents, servants and attorneys at any and all times to erect, construct, maintain, and use all such buildings, machinery, roads, pipelines, powerlines, and railroads, sink such shafts, drill such wells, remove such soil, and to remain on said lands or any part thereof for the foregoing purposes and to occupy as much of said lands as may be necessary or convenient for such purposes hereby expressly reserving to itself, its lessees, successors, and assigns, as aforesaid, generally all rights and power in, to, and over said land, whether herein expressed or not, reasonably necessary or convenient to render beneficial and efficient the complete enjoyment of the property and rights hereby expressly reserved.

This indenture is executed subject to the covenant that no person, firm, association or corporation shall take herring spawn in waters on or over the tidelands herein conveyed, nor shall any person, firm, association, organization or corporation engage in the sale, barter or exchange of herring spawn for profit, providing however, nothing herein shall be construed to prevent or prohibit the taking of herring spawn by residents of this State for (1) personal consumption or (2) barter or exchange for the necessities of life, pursuant to A.S. 10.10.140-170 as amended.

To Have and to Hold the said land with the appurtenances thereof unto the said Grantee and their heirs and assigns forever.

In Testimony Whereof the State of Alaska has caused these presents to be executed by the Director of the Division of Lands pursuant to A. S. 38.05.035, as amended this 4th day of January A.D. 1968.

[Signature]
 Acting Director, Division of Lands

State Record of Tideland Patents
 Vol. III
 Page 224

SUBSURFACE SOIL INVESTIGATION
JUNEAU SLUDGE INCINERATOR PROJECT

Prepared by:

R & M Engineering, Inc.
Juneau

August 10, 1989

R & M Project No. 891146



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SUBSURFACE SOIL INVESTIGATION
JUNEAU SLUDGE INCINERATOR PROJECT

INTRODUCTION

The subsurface investigation for the proposed sludge incineration foundation design of the Juneau Sewage Treatment Plant south of Juneau has been completed. In accordance with the understood scope of the project, a total of three borings were drilled and sampled at or as near as physically possible to the locations desired by James M. Montgomery Engineering personnel.

Conversations with design personnel indicate the project will consist of construction of a sludge incinerator and mechanical appurtenances. The deepest foundation excavation will be to Elevation 22' MLLW. Relatively heavy equipment will be located in the northerly end of the structure. A concrete slab-on-grade floor system is planned for all floor levels. A minimum of differential settlement is desirable to simplify mechanical connection design.

It is the purpose of this report to describe the field and laboratory investigation procedures; describe and analyze the field and laboratory data in terms of local geologic conditions; then offer conclusions and recommendations for foundation design and construction.



FIELD INVESTIGATION

The field investigation was completed on August 8, 1989, with a total of three borings accomplished. Borings were located at near as possible to points within the planned structure where the maximum loading is anticipated. In the case of the wet well excavation, this was fairly feasible; however, to the northwest corner of the proposed building, it was not. At that location, the nearest practical location was 60'± to the north of the proposed building corner due to presence of Sludge Storage Pond No. 1.

The test borings were advanced utilizing a Mobile B40H truck-mounted drill and 3.25" ID hollow stem auger. At 5' depth intervals, samples of material in advance of the auger bit were obtained utilizing the split barrel drive sampling method described in ASGM D1586-83. In this test, a 1.4" ID sampler is driven into undisturbed soil utilizing a 140 pound drop hammer free falling a standard 30". The number of standard blows required to advance the sampler through its final 12" of penetration is recorded and is referred to as the "N" value. The "N" value is the basis for estimating a number of soil engineering qualities including bearing value, angle of internal friction, and several others based on generally accepted standard reference tables. A representative sample of the soil in advance of the auger was preserved by the geologist in charge of the drilling operation for further study in our laboratory. A field log of soil conditions in each boring was also maintained by the geologist. These logs are available in finished form in the appendix of this report.

LABORATORY INVESTIGATION

The laboratory investigation for this project was limited to field moisture and grain-size analysis for Boring No. 1 to expedite this report. The soil conditions over the site are quite uniform (by visual analysis and studies by this firm and others near this site). The results of the laboratory investigation are summarized on the laboratory report in the appendix of this report.

SOIL CONDITIONS

Soil conditions within the depth interval tested are quite uniform over this site with the exception of the surficial 5'. Soils in the surficial 5' interval vary in consistency and gradation. The soils in vehicular traffic areas are of "medium dense" consistency to a depth of 5'± (see Boring No. SI-1). Below that depth, soil consistency is very uniform over the site with a slight decrease noted below the water table level. At Boring SI-3, "pit run" fill exists to a depth of 2'±.

With the exception of surficial fill (pit run sandy gravel) in SI-3, the soils consist of fine to coarse SAND having varying degrees of stratification. The sand is mine tailings left over from the A-J gold mine which operated until the mid-1940's before operations were terminated. Individual grains are angular to subangular and are generally in the "medium to coarse" sand size range with 7% to 15% passing the No. 200 screen. Unit weight, dry, is in the 90 to 100 PCF range. At an "N" value of 10, which is apparently the "site average," the angle of internal friction is approximately 30°.

The tailings SAND deposit extends to depths well beyond the maximum depth (33') explored during this testing program. Test borings performed by this firm and others in the treatment plant area prior to treatment plant construction suggest the tailings depth exceeds 50' at the proposed incinerator site.

WATER LEVEL CONDITIONS

The water level at the site is at approximately Elevation 13'± in all borings. Other water levels (perched) were noted during drilling to exist as high as Elevation 17'±. The possibility exists that the water level at the site is under tidal influence. For reference, the tidal data for Juneau are summarized as follows;

Mean Higher High Water	16.40'
Mean High Water	15.40'
Half Tide	8.50'
Mean Low Water	1.60'
Mean Lower Low Water	0.00'

It is probable, based on the site information available and the elevation of mean high tide indicated above, that the deepest excavation indicated (+22' MLLW) will not encounter ground water. However, the contractor should be aware that undiscovered, perched water levels may exist within this project site.

SITE GEOLOGIC CONDITIONS

Soils at this site are manmade as indicated previously herein and extend to a depth known to exceed 50' at this site. The manmade soils are underlain by a series of marine and glacial marine sediments overlying

bedrock which exists at a depth of approximately 100' as indicated on Drawing No. C-6 furnished by James M. Montgomery Engineers for the sludge treatment grading and soil boring plan. The bedrock is relatively fresh greenschist as noted in test borings in the immediate area by this firm and others.

The incinerator structure, as presently planned, will occupy an area now covered by a "solids storage pond." The pond apparently has an impermeable liner or else solids have thoroughly clogged the pore space in the sand as no moisture was evident at the supernatant fluid level in the test borings. The pond area backfill operation after excavation will require careful monitoring to provide a foundation soil modulus equivalent to the existing soil at equivalent depth.

SEISMIC CONDITIONS

Juneau is located in an area of "moderate" seismic activity within Zone 2 of the Uniform Building Code. However, various governmental agencies including the U.S. Army Corps of Engineers recommend that Zone 3 design criteria be incorporated in structural design. We concur with the Zone 3 recommendation due to the relatively short seismic history.

In the appendix of this report, the reader will find two maps, one indicating the regional seismicity through 1975 and the other indicating the maximum predicted peak acceleration contours for Southeast Alaska.

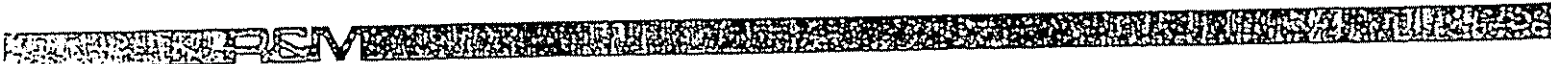


The peak acceleration for the probable 100-year design quake for the incinerator site as indicated on the map is 0.20 g. The probable epicenter locus for the design quake is in the Fairweather Fault located approximately 150 miles to the west. Studies for the Auke Bay Elementary School by R&M in 1979 indicate that a "low" probability exists that a peak acceleration of as much as 0.4 g could occur. Studies by the State of Alaska for the Douglas Bridge suggest a peak or acceleration of 0.12 g is probable for the "contingency earthquake."

Based on the above paragraph, it is evident that a wide range of maximum peak bedrock accelerations is predictable for the probable 100-year design quake. Without a preponderance of supportive evidence, we suggest that the design should be based on a peak acceleration of 0.2 g, particularly since soil amplification factors are unknown.

Studies by R&M for the design of the Juneau Treatment Plant in 1971 indicate a concern exists regarding the possibility of liquefaction. That study indicates that liquefaction of the material below the water table at this site could occur if the peak acceleration exceeds 0.15 g. However, if the site is filled to an elevation of $\pm 36.0'$ (as it evidently has been), then the maximum tolerable acceleration is 0.18 g. A copy of this report is available if the reader should desire.

Available information suggests that a moderately conservative design should be based on a peak acceleration of 0.20 g and it should be assumed that some settlement will occur near the outer perimeter of the general



area as a result of design earthquake liquifaction. Pipe connecting design should allow for limited flexibility to accommodate moderate differential settlement.

CONCLUSIONS AND RECOMMENDATIONS

Based on conversations with project personnel, it is understood that foundation design of the facility will involve the following basic requirements;

- Maximum depth of excavation (and burial) is 13' (Elevation 22').
- Relatively high foundation loads (unknown magnitude) will be imposed by foundation footings of mechanical equipment (incinerator and exhaust scrubbing unit).
- Reinforced concrete slab floors will be utilized throughout.
- Floor slab finished grade will be approximately the same as the existing general site elevation plus sufficient elevation to promote drainage.

The following data are based on these understood requirements and a memorandum to Jim Dorn from Ruth Davis of JMM dated August 1, 1989, in which certain foundation design data were requested.

- Angle of internal friction: 30° to 33°
- Dry unit weight (PCF): .90 to 95



- Unit weight at optimum moisture of 12% (estimated): 101 to 106 PCF
- Maximum recommended fill slope: 6:1
- Permeability: High (1.0 to 0.1 cm/sec)
- Relative density: 0.40 (SPG = 2.73)
- Safe allowable design load (safety factor 3): 2,000 PSF at 32" burial
- Minimum foundation footing burial by local building code: 32"
- Lateral soil pressure, K_h : 30 PSF (assumed horizontal surface)
- Passive soil pressure coefficient: 3.30 (assumed horizontal surface)
- Active soil pressure coefficient: 0.30 (assumed horizontal surface)
- Minimum footing width recommended: 18"
- Maximum overall settlement at 2,000 PSF loading: 1"
- Maximum differential settlement: 1/2"
- Coefficient friction; soil/cast-in-place concrete: 0.65 (Tan. 33°)

Note: A design load (short term) due to wind, live load, and seismic load equivalent to 3,000 PSF is allowable.

CONSTRUCTION RECOMMENDATIONS

Excavation

- Excavation slopes of up to 30° are allowable during construction.
- All excavated material should be usable as structural backfill with careful compaction-moisture control.

Backfill and Compaction

- Under footings and slabs, compact in-situ material to at least 95% of maximum established by ASTM D1557, Method D. Test utilizing nuclear gauge methods.
- In-situ material exists in a relatively dry condition vis optimum moisture. Compaction equipment should include a method of applying adequate moisture to the fill materials and operations should be staged to avoid saturation while maintaining optimum moisture. Unless these conditions are adequately met, experience has shown that the in-situ material cannot be economically compacted to 95% of ASTM D1557, Method D.
- Compaction in lifts not exceeding 6" in thickness is recommended for vibratory plate type compactors. Lifts up to 18" may be compactible by heavy vibratory drum compaction equipment with good moisture control.
- Dewatering of excavations will be unnecessary for excavations above Elevation 18'.

- Ditching or temporary berming should be constructed to route runoff away from excavations.

CLOSURE

The construction and design recommendations offered herein are based on the understood design requirements indicated in the introduction to this report. Any substantial change in these requirements, especially with regard to depth of excavation, should be evaluated.

The recommendations for foundation design are based on test information from borings located up to 60' away from the site of the planned structure. The possibility exists that soil conditions within the actual structural footprint could vary from those indicated in this report. Variation could result in a claim for "changed" soil conditions; however we consider this a remote possibility. If this situation occurs, we would appreciate the opportunity to observe and comment regarding the points in question.

During construction excavation, we recommend that a qualified soils engineer or engineering geologist should observe each excavated area to verify that soil conditions are substantially similar to those predicted in this report.

Compaction control is an important component of the construction phase of this project. R & M Engineering has the in-house capability to provide all necessary laboratory and field compaction control services indicated in this report.



We appreciate the opportunity to be of service to James M. Montgomery Engineers on this timely project. Should there be questions, or if we may be of further assistance, please do not hesitate to contact us at your convenience.

Sincerely,

R & M ENGINEERING, INC.



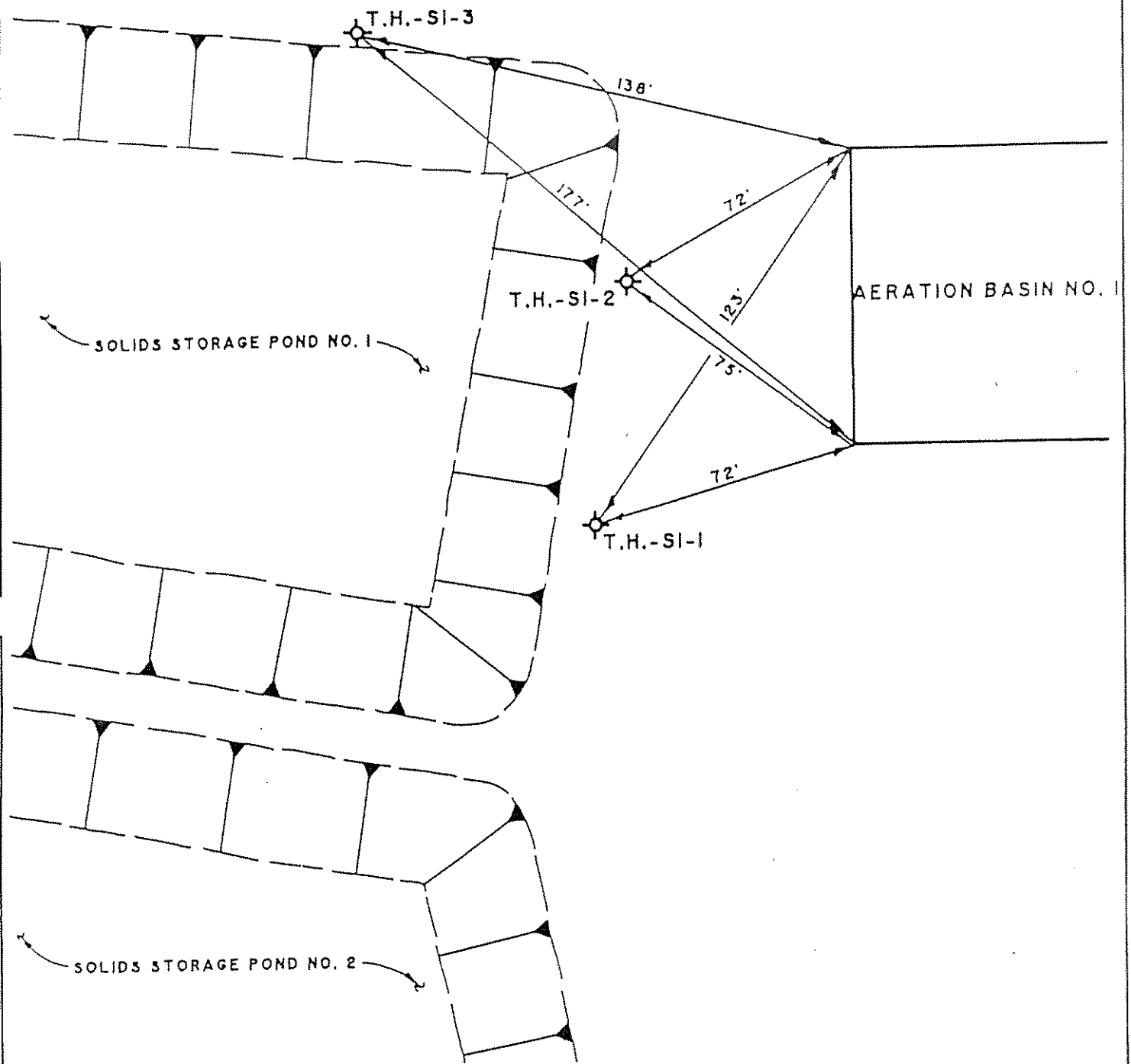
Joseph L. Connolly, P.G., E.G.
Engineering Geologist

fej



Malcolm A. Menzies, P.E.
Civil Engineer





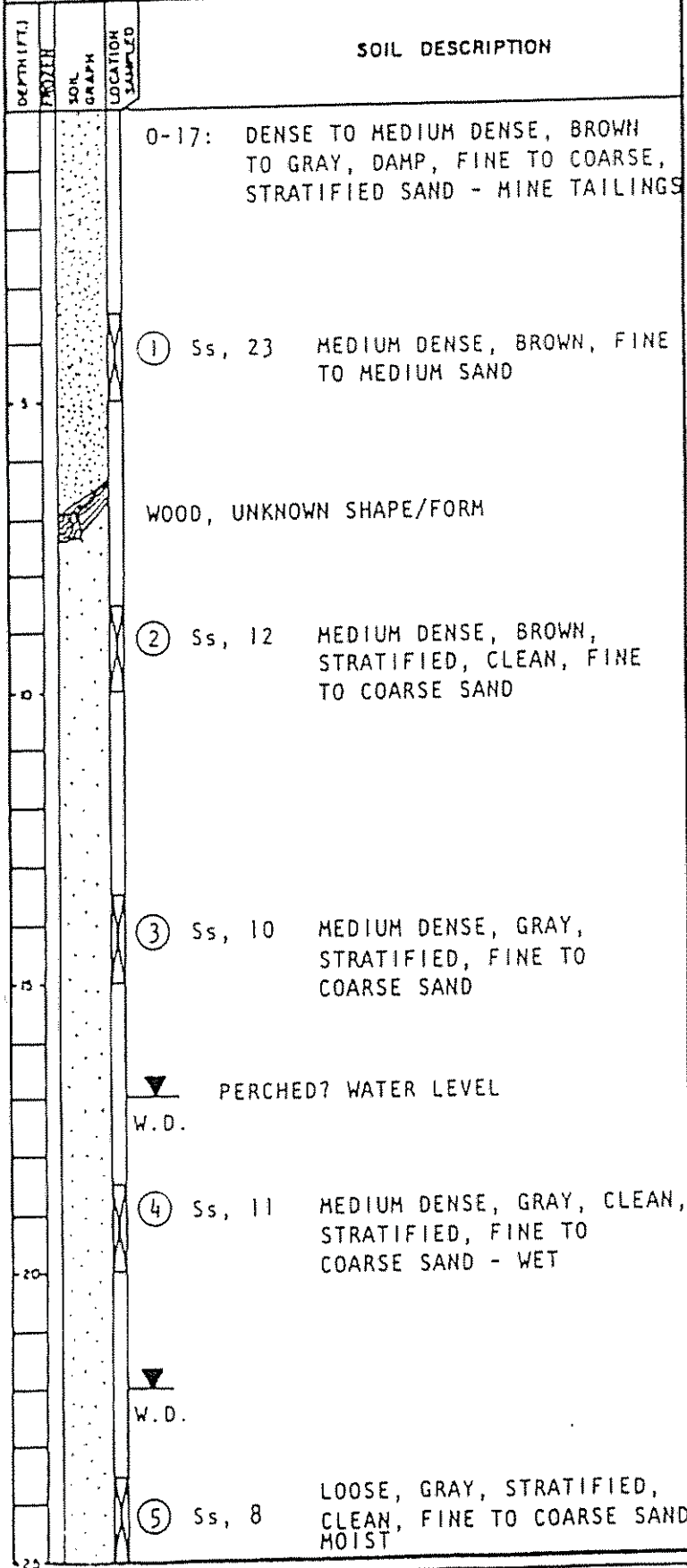
BORING LOCATION SKETCH
FOR
C.B.J. SLUDGE INCINERATOR

DATE	SCALE	DRAWN BY	CHECKED BY	PROJECT NO.	DRAWING NO.
8-14-89	1"=40'	D.S.	J.C.	891146	

BORING NUMBER SI-1 Date Completed: 8-7-89

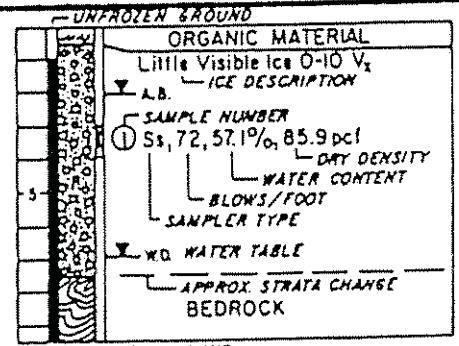
LOCATION SKETCH

No Scale



NOTE: DISTANCES SHOWN ARE APPROXIMATE AND HAVE NOT BEEN MEASURED BY SURVEYING METHODS.

EXPLANATION



TYPICAL SOILS LOG

- S₁ 1.4" SPLIT SPOON WITH 140 LB. HAMMER
- S₂ 1.4" SPLIT SPOON WITH 340 LB. HAMMER
- S₃ 2.5" SPLIT SPOON WITH 340 LB. HAMMER
- S₄ 2.5" SPLIT SPOON, PUSHED
- A AUGER SAMPLE
- T₁ SHELBY TUBE
- T₂ MODIFIED SHELBY TUBE
- B₁ BULK SAMPLE

SAMPLER TYPE SYMBOLS

	ORGANIC MATERIAL		GRAVEL
	CLAY		COBBLES & BOULDERS
	SILT		BEDROCK
	SAND		ICE, MASSIVE

SOIL SYMBOLS

DWH D.S.
 CKD J.C.
 DATE: 8-14-89

R&M ENGINEERING, INC.
 ENGINEERS GEOLOGISTS SURVEYORS
 SOILS LOG

C.B.J. Sludge Incinerator
 Foundation Soil Investigation

FB
 GRID
 PROJ. NO. 89J146
 DWG. NO.

BORING NUMBER SI-1 Date Completed: 8-7-89

LOCATION SKETCH

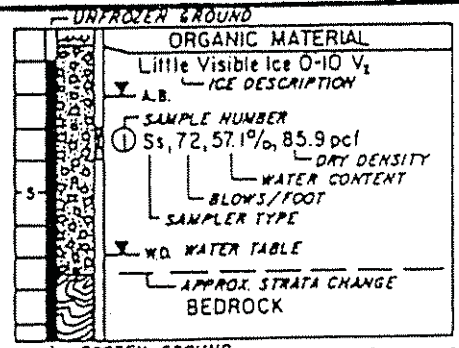
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DEPTH (FT.)	SOIL GRAPH	LOCATION SAMPLED	SOIL DESCRIPTION
			NOTE: 12" OF "HEAVE" IN AUGER AT SAMPLE 6 LEVEL
30		⑥	Ss, 12 MEDIUM DENSE, GRAY, MOIST, FINE TO COARSE SAND
			NOTE: 60" OF HEAVE IN AUGER AT SAMPLE 7 LEVEL. NO SAMPLE POSSIBLE.
		⑦	Ss, NR
36			BOTTOM OF BORING

NOTE: DISTANCES SHOWN ARE APPROXIMATE AND HAVE NOT BEEN MEASURED BY SURVEYING METHODS.

EXPLANATION



TYPICAL SOILS LOG

W.D. - WHILE DRILLING
A.B. - AFTER BORING

- S₁ 1.4" SPLIT SPOON WITH 140 LB. HAMMER
- S₂ 1.4" SPLIT SPOON WITH 340 LB. HAMMER
- S₃ 2.5" SPLIT SPOON WITH 340 LB. HAMMER
- S₄ 2.5" SPLIT SPOON, PUSHED
- A AUGER SAMPLE
- T₁ SHELBY TUBE
- T₂ MODIFIED SHELBY TUBE
- B₁ BULK SAMPLE

SAMPLER TYPE SYMBOLS

	ORGANIC MATERIAL		GRAVEL
	CLAY		COBBLES & BOULDERS
	SILT		BEDROCK
	SAND		ICE, MASSIVE

SOIL SYMBOLS

DWK D.S.
CKD J.C.
DATE: 8-14-89

R&M ENGINEERING, INC.
ENGINEERS GEOLOGISTS SURVEYORS
SOILS LOG

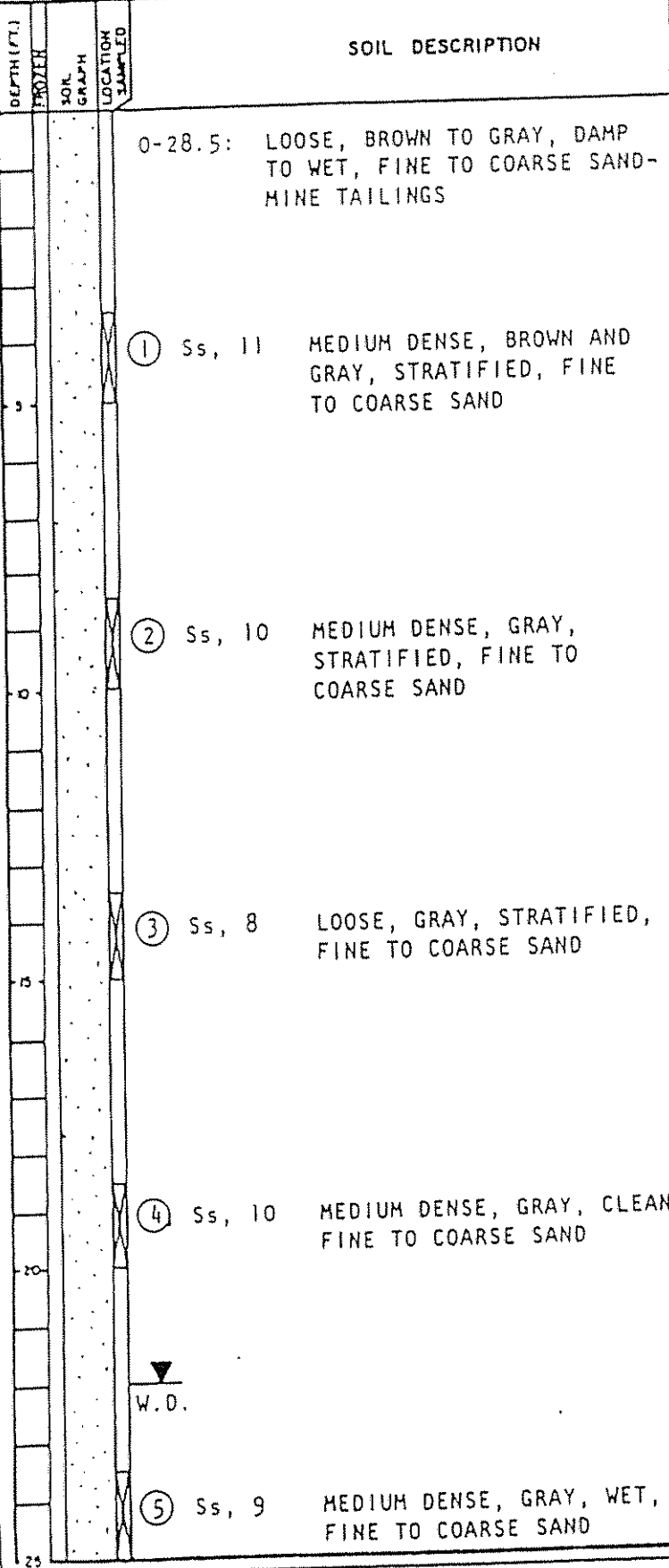
C.B.J. Sludge Incinerator
Foundation Soil Investigation

FB.
GRID
PROJ. NO 891146

BORING NUMBER SI-2 Date Completed: 8-7-89

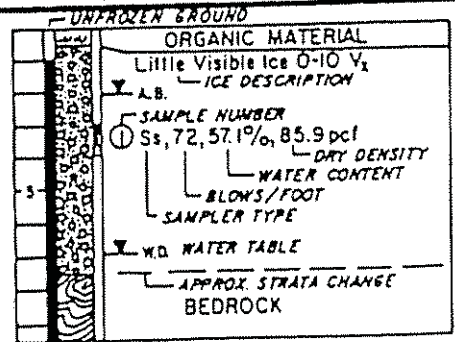
LOCATION SKETCH

No Scale



NOTE: DISTANCES SHOWN ARE APPROXIMATE AND HAVE NOT BEEN MEASURED BY SURVEYING METHODS.

EXPLANATION



TYPICAL SOILS LOG W.D.-WHILE DRILLING A.B.-AFTER BORING

- S₁ 1.4" SPLIT SPOON WITH 140 LB. HAMMER
- S₂ 1.4" SPLIT SPOON WITH 340 LB. HAMMER
- S₃ 2.5" SPLIT SPOON WITH 340 LB. HAMMER
- S₄ 2.5" SPLIT SPOON, PUSHED
- A AUGER SAMPLE
- T₁ SHELBY TUBE
- T₂ MODIFIED SHELBY TUBE
- B₁ BULK SAMPLE

SAMPLER TYPE SYMBOLS

	ORGANIC MATERIAL		GRAY FL
	CLAY		COBBLES & BOULDERS
	SILT		BEDROCK
	SAND		ICE, MASSIVE

SOIL SYMBOLS

DWH D.S.
CKQ J.C.
DATE 8-14-89

R&M ENGINEERING, INC.
ENGINEERS GEOLOGISTS SURVEYORS

C.B.J. Sludge Incinerator
Foundation Soil Investigation

FB
GRID
PROJ NO 891146

BORING NUMBER SI-2 Date Completed: 8-7-89

SOIL DESCRIPTION

DRILLED TO 28.5'. DISCOVERED 3' OF "HEAVE" IN AUGER PRIOR TO SAMPLING. NO SAMPLE POSSIBLE. SAME MATERIAL AS ABOVE

BOTTOM OF BORING 2

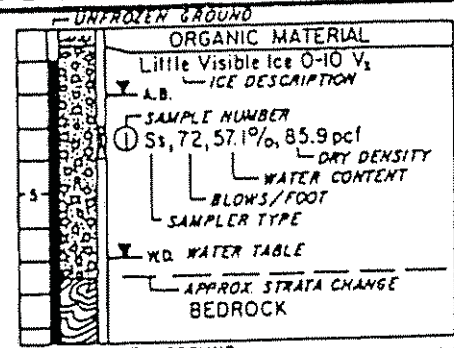
LOCATION SKETCH

No Scale



NOTE: DISTANCES SHOWN ARE APPROXIMATE AND HAVE NOT BEEN MEASURED BY SURVEYING METHODS.

EXPLANATION



TYPICAL SOILS LOG

- Ss 14" SPLIT SPOON WITH 140 LB HAMMER
- Ss 1.4" SPLIT SPOON WITH 340 LB HAMMER
- Sh 2.5" SPLIT SPOON WITH 340 LB HAMMER
- Sp 2.5" SPLIT SPOON, PUSHED
- A AUGER SAMPLE
- Ts SHELBY TUBE
- Tm MODIFIED SHELBY TUBE
- Bs BULK SAMPLE

SAMPLER TYPE SYMBOLS

- | | | | |
|--|------------------|--|--------------------|
| | ORGANIC MATERIAL | | GRAVEL |
| | CLAY | | COBBLES & BOULDERS |
| | SILT | | BEDROCK |
| | SAND | | ICE, MASSIVE |

SOIL SYMBOLS

DWK D.S.
CKD J.C.
DATE: 8-14-89

R&M ENGINEERING, INC.
ENGINEERS GEOLOGISTS SURVEYORS
SOILS LOG

C.B.J. Sludge Incinerator
Foundation Soil Investigation

FB
GRID
PROJ. NO 891146
DWG NO

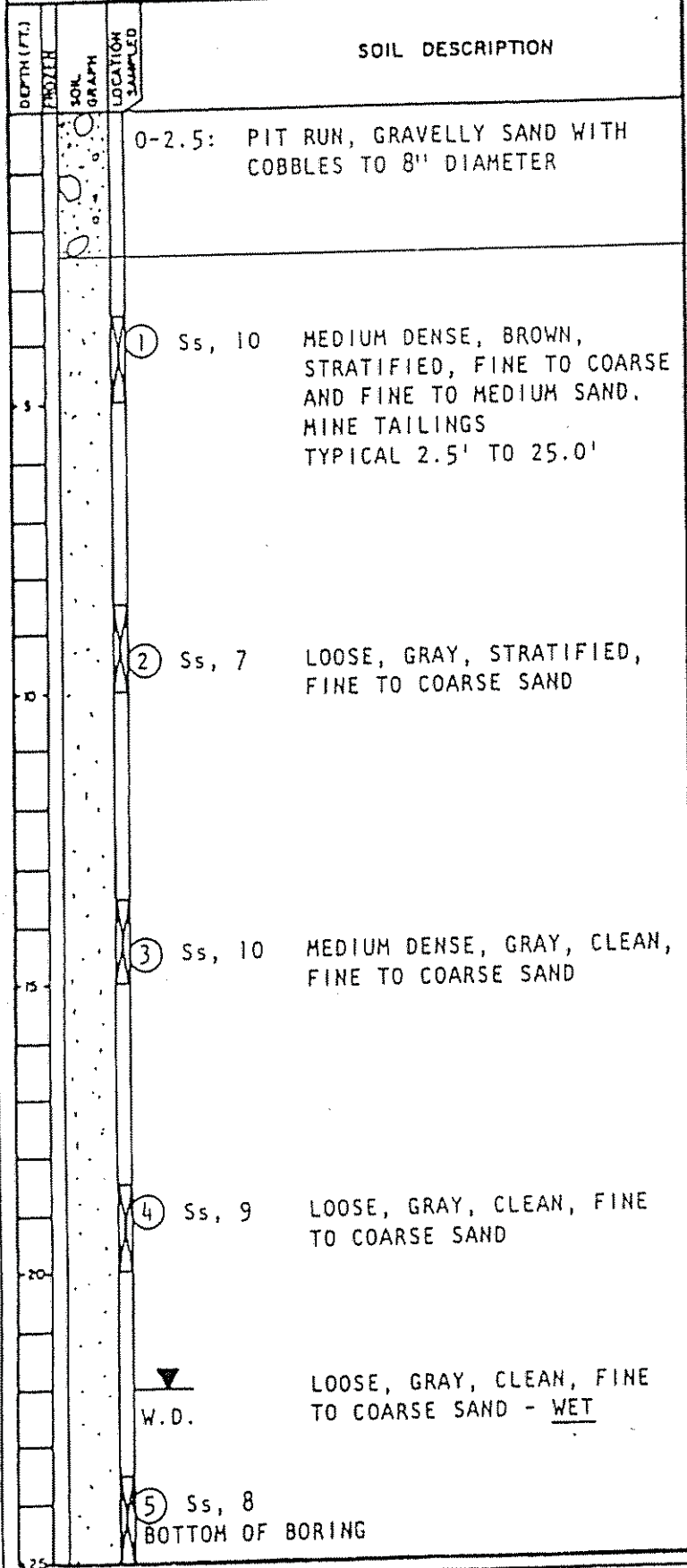
BORING NUMBER SI-3 Date Completed: 8-7-89

LOCATION SKETCH

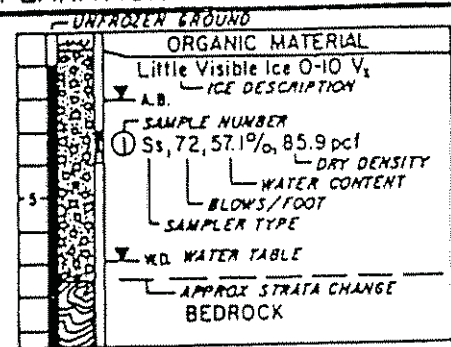
No Scale



NOTE: DISTANCES SHOWN ARE APPROXIMATE AND HAVE NOT BEEN MEASURED BY SURVEYING METHODS.



EXPLANATION



TYPICAL SOILS LOG

- S₁ 1.4" SPLIT SPOON WITH 140 LB. HAMMER
- S₂ 1.4" SPLIT SPOON WITH 340 LB. HAMMER
- S₃ 2.5" SPLIT SPOON WITH 340 LB. HAMMER
- S₄ 2.5" SPLIT SPOON, PUSHED
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- T₂ MODIFIED SHELBY TUBE
- B₁ BULK SAMPLE

SAMPLER TYPE SYMBOLS

	ORGANIC MATERIAL		GRAVEL
	CLAY		COBBLES & BOULDERS
	SILT		BEDROCK
	SAND		ICE, MASSIVE

SOIL SYMBOLS

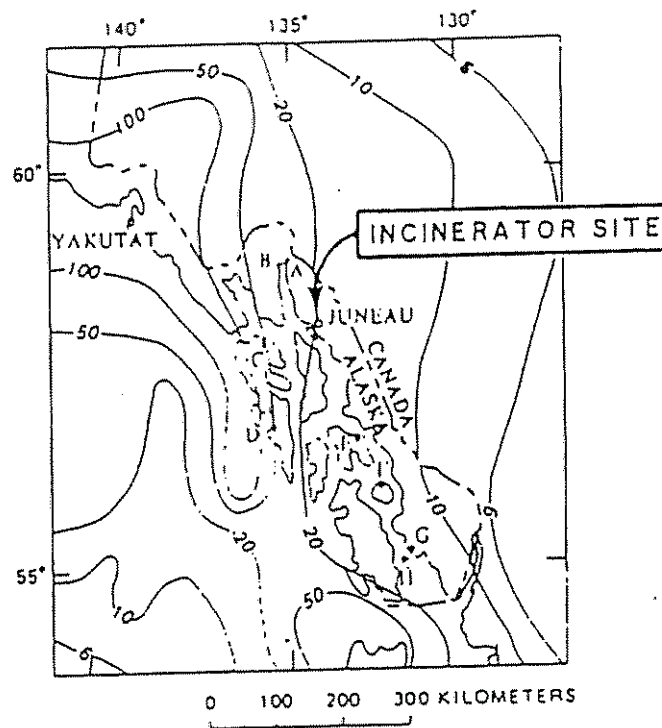
DWN D.S.
CKD J.C.
DATE: 8-14-89

R&M ENGINEERING, INC.
ENGINEERS GEOLOGISTS SURVEYORS
SOILS LOG

C.B.J. Sludge Incinerator
Foundation Soil Investigation

FB
GRID
PROJ. NO 891146
DWG. NO

ONE-HUNDRED-YEAR PROBABILITY MAP SHOWING DISTRIBUTION OF PEAK ACCELERATIONS FROM EARTHQUAKES AS PERCENT OF GRAVITY FOR SOUTHEASTERN ALASKA



EXPLANATION

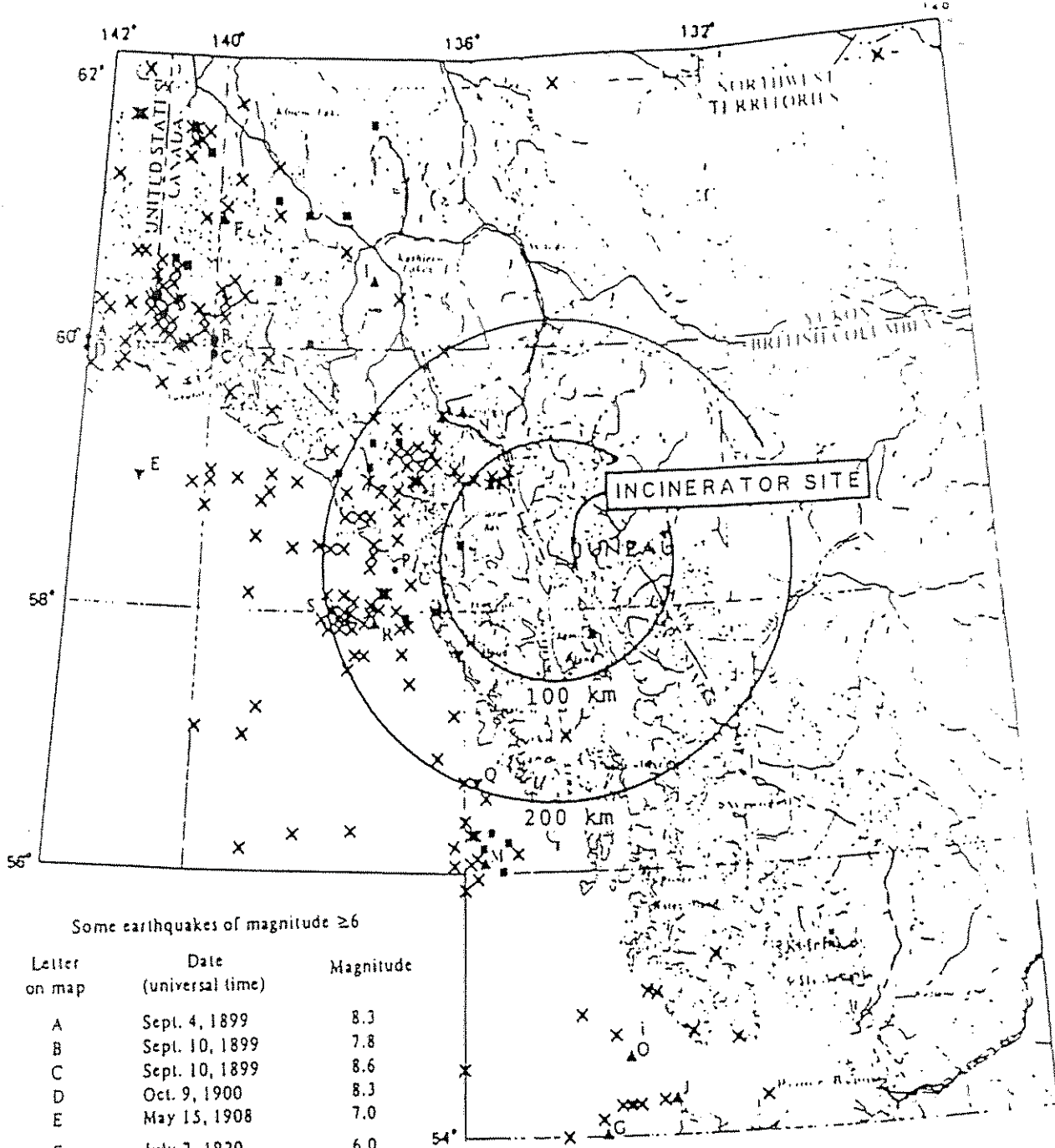
— 10 — Contour — Showing peak accelerations from earthquakes as a percent of gravity

- | | |
|-----------|--------------|
| A Skagway | E Petersburg |
| B Haines | F Wrangell |
| C Hoonah | G Ketchikan |
| D Sitka | H Metlakatla |

One-hundred-year probability map showing distribution of peak accelerations from earthquakes as percent of gravity for southeastern Alaska and part of Canada. Modified from Milne and Davenport (1969). Map is based upon the amount of energy released by the largest earthquake (magnitude >2.5) that occurred each year in a unit area of 10,000 km² during the period from 1899 through 1960, projected to a 100-year interval.

(From Yehle, 1979, figure 6)

SLUDGE INCINERATOR SITE

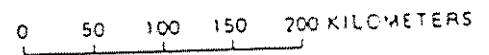


Some earthquakes of magnitude ≥ 6

Letter on map	Date (universal time)	Magnitude
A	Sept. 4, 1899	8.3
B	Sept. 10, 1899	7.8
C	Sept. 10, 1899	8.6
D	Oct. 9, 1900	8.3
E	May 15, 1908	7.0
F	July 7, 1920	6.0
G	April 10, 1921	6.5
H	Oct. 24, 1927	7.1
I	Feb. 3, 1944	6.5
J	Aug. 2, 1945	6.25
K	Feb. 28, 1948	6.5
L	Aug. 22, 1949	8.1
M	Oct. 31, 1949	6.25
N	Mar. 9, 1952	6.0
O	Nov. 17, 1956	6.5
P	July 10, 1958	7.9
Q	July 30, 1972	7.25
R	July 1, 1973	6.7
S	July 3, 1973	6.0

EXPLANATION

- ≥ 8
- ▼ $\geq 7 - < 8$
- ▲ $\geq 6 - < 7$
- $\geq 5 - < 6$
- X < 5 or not computed



INDEX MAP SHOWING REGIONAL SEISMICITY OF SOUTHEASTERN ALASKA, 1899 to 1975

100 and 200-km radii are shown for the Sludge Incineratory Site, City and Borough of Juneau. Map modified from Yehle, 1979, U.S. Geological Survey Prof. Paper 1074.



R & M ENGINEERING, INC.

SLUDGE INCINERATOR SITE



**AERIAL PHOTO OF JUNEAU-DOUGLAS WASTEWATER TREATMENT PLANT
PROPERTY BOUNDARY**

Source: City and Borough of Juneau GIS Department, 2013

Section 6. Waste Handling and Processing Information

[18 AAC 60.210(b)(2); 18 AAC 60.210(b)(3)(B); 18 AAC 60.210(b)(4)]

1. List the amounts of the sewage solids you expect to receive at the site each year from each source:

Quantity (Tons/Yr or yd ³ /Yr)	Source
50.00	Biosolids & debris from sewer collections system (yd ³ /yr)
50.00	TOTAL

2. Check the type(s) of waste processing done at the monofill before waste is disposed of:

Dewatering Composting

Other:

3. Describe how the determination that the sewage solids pass the paint filter test will be made?

See attached Monitoring Plan, Section 9.3.2

4. State which pathogen reduction method of 40 CFR 503.32 will be met for the sewage solids, and list any laboratory analyses required to meet the requirement.

See attached Monitoring Plan, Section 9.3.5 and 9.6

5. State which vector attraction reduction method of 40 CFR 503.33 will be met for the sewage solids, and list any laboratory analyses required to meet the requirement.

See attached Operations Plan, Sections 8.7.8; Monitoring Plan, Section 9.3.5

Section 7. Facility Design

A complete set of design drawings must be submitted with the following information, with drawings included for both the design and closure of the monofill, as appropriate. Monofill drawings should be organized as shown below, with the design drawings placed in the first part of the drawing set and closure drawings included at the end of the set. It is understood that monofill closure design drawings will be conceptual only, unless the monofill is within 5 years of closing.

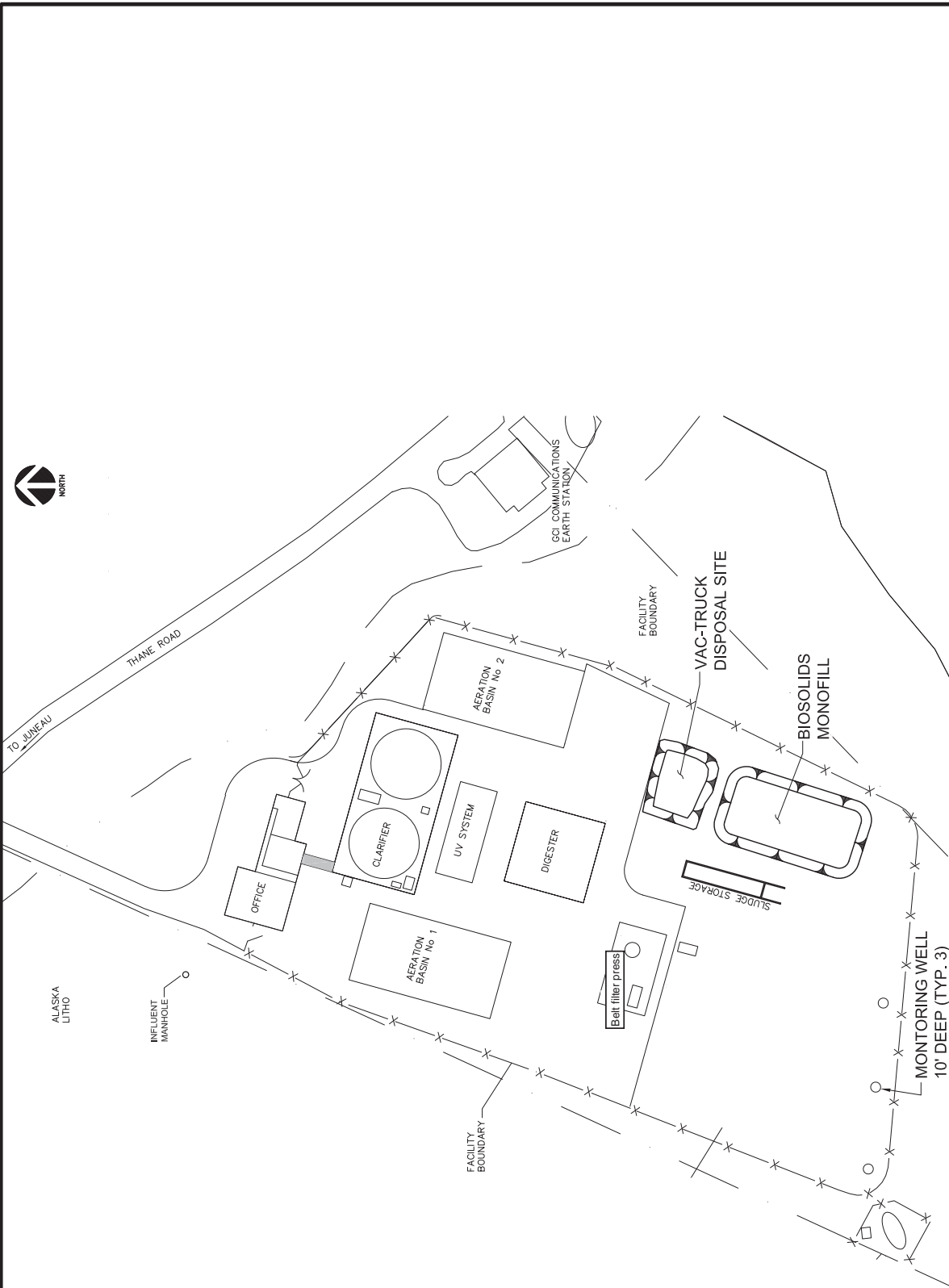
Note: For landfills accepting more than 5 tons per day of sewage solids, all design documents must be stamped and sealed by a registered engineer. [18 AAC 60.210(c)]

Monofill Design Drawings [18 AAC 60.410]

1.	Site map(s) which show site conditions including: [18 AAC 60.210(b)(3)(B); 18 AAC 60.210(b)(3)(C); 18 AAC 60.220; 18 AAC 60.233; 18 AAC 60.470(c); 18 AAC 60.470(g)]
	a. All previous, existing and planned disposal areas. The map should demonstrate all waste will be at least 50 feet from the monofill property boundaries.
	b. Fences, gates, berms and other access control devices around the facility.
	c. Access roads to and within the facility.
2.	Plan view drawings with contour lines <u>and</u> cross section drawings that show: [18 AAC 60.210(b)(3); 18 AAC 60.210(b)(4); 18 AAC 60.410(b)(2); 18 AAC 60.410(c); 18 AAC 60.470(e)]
	a. Any planned excavations before waste cell construction.
	b. All roads, ditches, trenches and berms associated with the monofill.
	c. Any planned leachate collection system, including manholes and pump stations.
3.	Construction detail drawings <u>and</u> cross sections including storm water drainage structures, culverts and other surface water control devices [18 AAC 60.210(b)(3); 18 AAC 60.225; 18 AAC 60.410(b)(2); 18 AAC 60.410(c); 18 AAC 60.470(e)]
	a. As applicable, liner construction details including cover and liner anchors, liner penetrations, etc.
	b. Storm water drainage structures, culverts, and other surface water control devices.
4.	Design calculations, data and documentation must include the following and supporting calculations. [18 AAC 60.210(b)(3); 18 AAC 60.210(b)(4); 18 AAC 60.210(c); 18 AAC 60.227(b); 18 AAC 60.410(c)]
	a. Printouts of inputs, assumptions and outputs from any computer model used to support the facility design.
	b. Information and calculations of the wastes that will be disposed onsite over the usable life of the facility and the maximum design capacity of the facility.
	c. Information and calculations showing how the facility will be protected from any reasonably anticipated natural event such as aufeis, floods, earthquakes, thawing of unstable permafrost, and the effects of freezing and thawing.
	d. Information and calculations used to estimate the permeability of the liner and the maximum anticipated depth of leachate over any proposed liner.
	e. A Quality Assurance Plan for the liner installation.
	f. If located on permafrost, documentation showing that the permafrost will remain frozen to the greatest extent practical.

Monofill Closure Drawings [18 AAC 60.210(b)(3)(E); 18 AAC 60.470(n); 18 AAC 60.470(o)]

- | | |
|----|--|
| 5. | Conceptual drawings of the facility after closure is completed. |
|----|--|



DRAWING
SHEET No.
of

**BIO SOLIDS MONOFILL
SITE PLAN**

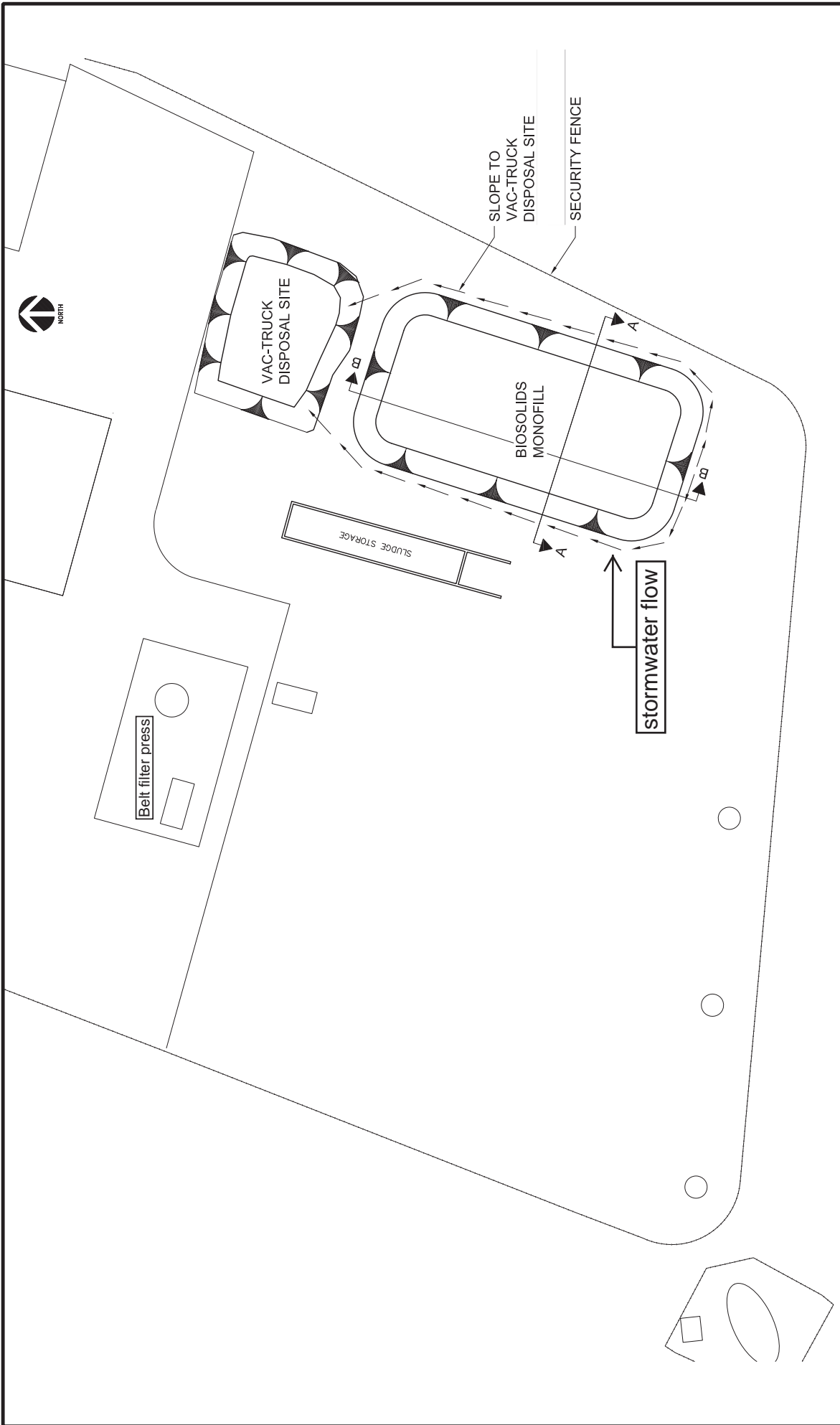
CDI
Carson Dam Inc.
 712 WEST 12TH STREET
 JUNEAU, ALASKA 99801
 (907) 586-4447

**JUNEAU - DOUGLAS
WASTEWATER TREATMENT PLANT
BIO SOLIDS MONOFILL**

CITY/BOROUGH OF JUNEAU
 ALASKA'S CAPITAL CITY

SCALE	GRAPHIC
DESIGNED	JLD
DRAWN	CSM
CHECKED	JLD
DATE	MAR 2012

REV	DATE	BY	DESCRIPTION



DRAWING
SHEET No.
of

**BIOSOLIDS MONOFILL
GRADING PLAN**

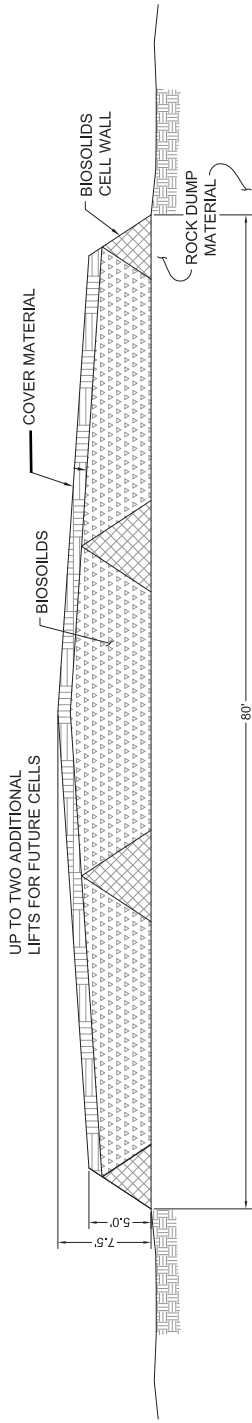
Carson Dam Inc.
712 WEST 12TH STREET
JUNEAU, ALASKA 99801
(907) 586-4447

**JUNEAU - DOUGLAS
WASTEWATER TREATMENT PLANT
BIOSOLIDS MONOFILL**



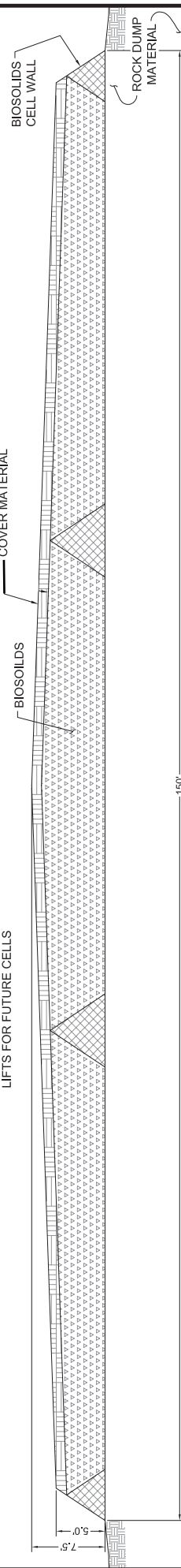
SCALE	GRAPHIC
DESIGNED	JLD
DRAWN	CSM
CHECKED	JLD
DATE	MAR 2012

REV	DATE	BY	DESCRIPTION



SECTION A-A
SCALE: 1"=10'

UP TO TWO ADDITIONAL LIFTS FOR FUTURE CELLS

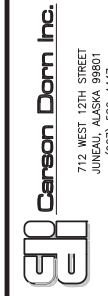


SECTION B-B
SCALE: 1"=10'

REV	DATE	BY	DESCRIPTION



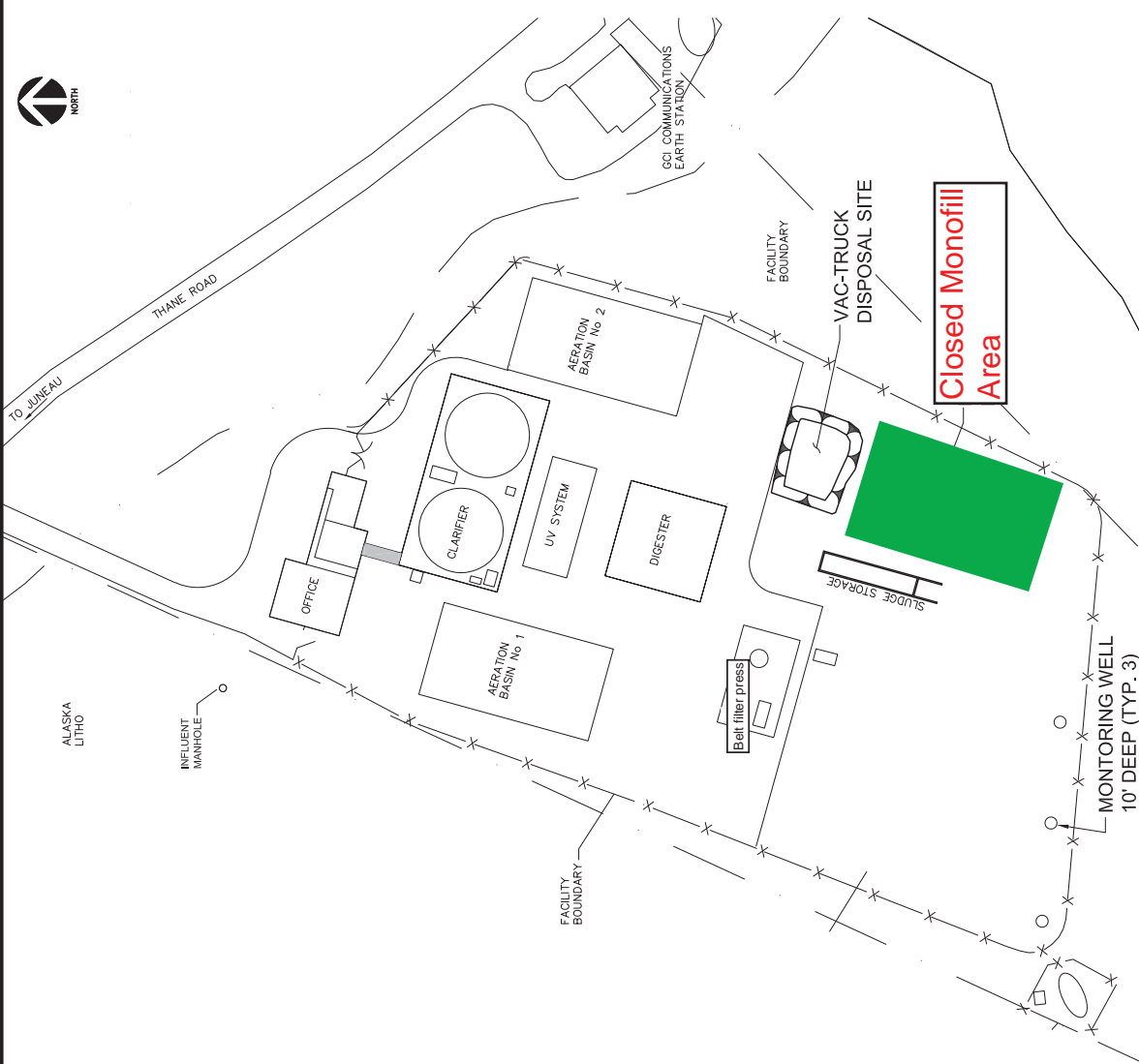
JUNEAU - DOUGLAS
WASTEWATER TREATMENT PLANT
BIOSOLIDS MONOFILL



712 WEST 12TH STREET
JUNEAU, ALASKA 99801
(907) 586-4447

BIOSOLIDS MONOFILL
SECTIONS

DRAWING
SHEET No.
of



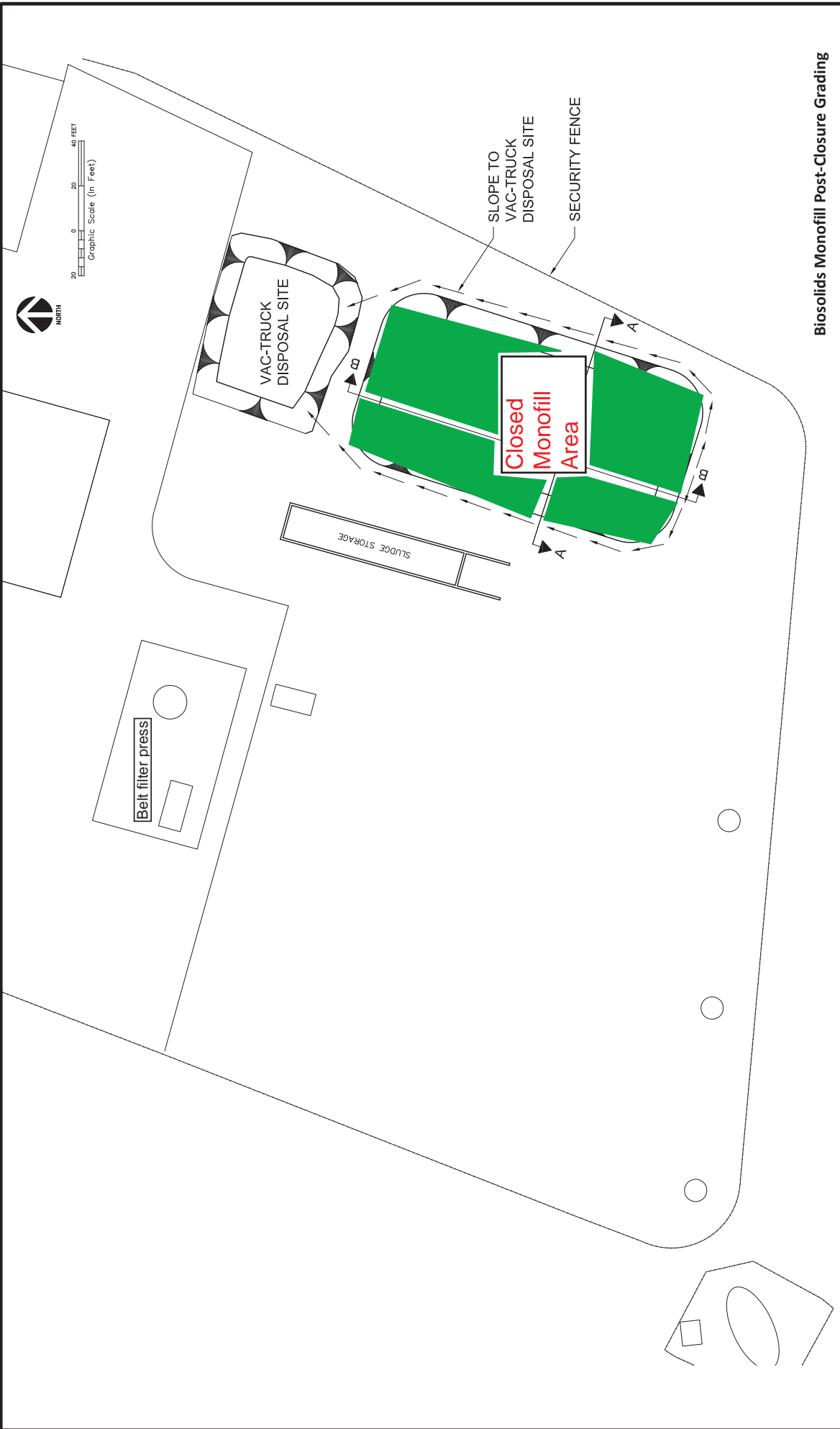
Biosolids Monofill Post-Closure Area

DRAWING: _____
SHEET No.: _____ of _____

**JUNEAU - DOUGLAS
WASTEWATER TREATMENT PLANT
BIOSOLIDS MONOFILL**



REV	DATE	BY	DESCRIPTION



Biosolids Monofill Post-Closure Grading

DRAWING		JUNEAU - DOUGLAS WASTEWATER TREATMENT PLANT BIOSOLIDS MONOFILL		CITY/BOROUGH OF JUNEAU ALASKA'S CAPITAL CITY		SHEET No. _____ of _____	
REV	DATE	BY	DESCRIPTION				

Section 8. Operations Plan

The operations plan should be a separate document that provides sufficient detail and information to guide a monofill operator in performing all necessary tasks for day-to-day operation of the monofill.

The operations plan is a flexible document that should be reviewed annually and updated as necessary. The following table represents the minimum requirements which must be included. Additional information should be included, as needed to ensure the facility operates in compliance with the State Solid Waste Regulations. A copy of the operations plan should be kept at the monofill and it **must include** the following information.

1.	Access control [18 AAC 60.210(b)(3)(C); 18 AAC 60.220]
	a. Access to the facility will be controlled using gates, fences, berms or other means of preventing access; hours of operation; signage; and other control measures.
	b. Prohibited activities, such as target practice or off road vehicle use will be prevented.
	c. Access and onsite roads will be kept passable and safe for vehicles year round.
	d. List where each of the previous items are located in the Operations Plan by section or page number. See attached Part 8-Operations Plan; Part 8.3-Site Access Control
2.	Waste acceptance and handling policy [18 AAC 60.210(b)(3)(C); 18 AAC 60.240(a); 18 AAC 60.240(b); 18 AAC 60.420(b); 18 AAC 60.470(b); 18AAC 60.470(i)]
	a. Waste screening procedures to ensure no wastes other than sewage solids are disposed in the facility.
	b. Required signage placed at the facility entrance.
	c. Waste processing procedures prior to disposal, including pathogen reduction, vector attraction reduction, and dewatering.
	d. List where each of the previous items are located in the Operations Plan by section or page number. See attached Section 8-Operations Plan; Part 8.5-Waste Acceptance Policy
3.	Waste placement plan [18 AAC 60.210(b)(3)(B); 18 AAC 60.210(b)(3)(C); 18 AAC 60.225(a); 18 AAC 60.470(h)]
	a. Waste placement methods (specific details defining the process).
	b. The planned progression of the working face, including monofill development over the life of the facility (diagrams are acceptable).
	c. How unstable slopes will be avoided.
	d. List where each of the previous items are located in the Operations Plan by section or page number. See attached 8.6-Waste Placement

4.	Cover plan [18 AAC 60.210(b)(3)]
	<p>a. The type of cover material(s) that will be used and describe:</p> <ul style="list-style-type: none"> • Where the cover material will be obtained and stored, • The frequency cover will be applied, and • The depth of cover that will be applied.
	<p>b. List where each of the previous items are located in the Operations Plan by section or page number. See attached Operations Plan part 8.6.4.3; Closure Plan parts 10.8-10.9</p>
5.	Litter, vector and nuisance control plan [18 AAC 60.210(b)(3)(C); 18 AAC 60.210(b)(3)(D); 18 AAC 60.230(a); 18 AAC 60.233(2); 18 AAC 60.420(a); 18 AAC 60.470(i); 18 AAC 60.470(l); 18 AAC 60.470(m); AS 46.06.080]
	<p>a. Procedures to ensure wildlife and domestic animals do not endanger the public or monofill staff, are not harmed by contact with the waste, and do not become a nuisance.</p>
	<p>b. Procedures to control dust, odor, noise, traffic, litter, disease vectors and other effects from facility operations so they do not become a nuisance or hazard outside of the monofill property boundaries.</p>
	<p>c. List where each of the previous items are located in the Operations Plan by section or page number. See attached Operations Plan part 8.7</p>
6.	Corrective action plan (procedures for immediate action) [18 AAC 60.210(b)(3)(C); 18 AAC 60.210(b)(3)(D); 18 AAC 60.815(a)]
	<p>a. Cleaning up any improper or unauthorized waste disposal</p>
	<p>b. Repairing any damage to the facility or structures</p>
	<p>c. Addressing any violations of regulations or permit conditions.</p>
	<p>d. List where each of the previous items are located in the Operations Plan by section or page number. See attached Monitoring Plan part 9.10</p>
7.	Operating record [18 AAC 60.235; 18 AAC 60.470(k)]
	<p>a. State where will the operating record for the facility be kept. Operating records will be kept at the JDTP offices.</p> <p>Note: The operating record must contain all documentation listed in 18 AAC 60.235 and 18 AAC 60.470(k) and be retained in a location readily accessible to DEC and facility employees.</p>

**JUNEAU-DOUGLAS WASTEWATER TREATMENT PLANT PERMIT RENEWAL APPLICATION,
PERMIT NO. SWZA013-22
SECTION 8. OPERATIONS PLAN**

8.1. PURPOSE

The purpose of this Operations Plan is to ensure the CBJ JDTP monofill is operated safely and efficiently.

The plan documents procedures and operational processes which will allow CBJ to operate solid waste facilities at the JDTP without causing nuisance or resulting in contamination of air, surface water or groundwater. CBJ intends to demonstrate its intention to:

- Maintain and operate in an environmentally acceptable manner its municipal biosolid waste treatment and disposal facility, and
- Ensure that all pertinent State, Federal and local regulations are met.

8.2. DESCRIPTIONS OF EXISTING SOLID WASTE SYSTEM

CBJ Wastewater Utility staff use vactor (vacuum/jet) trucks to maintain the sewer collection system. As part of the routine cleaning program, the trucks vacuum sand, grit, gravel and solids from the bottom of drop inlets, manholes, sewer lines, and lift station wet wells. The waste in the trucks is taken to the JDTP and dumped into the vactor truck settling pond. The settling pond is approximately 90' x 35' and about 7' deep or an area of 3,150 square feet (sf) and a volume of 22,050 cubic feet. The east side of the pond has an asphalt platform for the trucks to back up to the edge of the basin and discharge their contents. The west end of the basin has a float controlled pump which is used to maintain the liquid level in the pond. The liquid supernatant is returned to the plant for treatment and disposal.

The accumulated solids in the vactor truck settling pond are excavated as needed to provide sufficient pond capacity for cleaning deposits. The pond is pumped down to allow the settled material to dewater. The dewatered solids are handled in one of three following ways depending upon the final end destination:

1. If the solids are being disposed of down south at an out-of-state landfill (with other biosolids generated during the full-scale treatment process, NPDES Permit No. AK-002321-3), the dewater solids are dredged and deposited directly into the shipping containers for final disposal in an Oregon landfill.
2. If the solids are used as cover material at the local Capitol Disposal Landfill, the dewatered solids are treated to meet EPA's 40 CFR 503 Class B biosolids standards via lime stabilization as described, tested, approved for acceptance by the landfill, and transported via dump truck.
3. If the solids are monofilled, the monofill area is prepared for deposit by digging a trench in the top of the stabilization area, the dewatered solids are treated via lime stabilization to a Class B product, tested, are placed in the trench and buried, a geotextile fabric is placed over the top, and the area is capped with soil.

The biosolids are primarily sent to the out-of-state landfill for disposal or used as cover at Capitol Disposal Landfill. Monofilling is intended to be used as the last option for disposal. A more thorough discussion on selection of the disposal method is provided in section 8.6.4.

The current monofill area is approximately 10,625 sf (85' by 125'). There is room within the facility boundary to expand the footprint if necessary. The current height of the monofill is about 7'. The height can be increased to as much as 10'. With most biosolids being shipped out-of-state or used as cover at the local landfill, annual addition to the existing monofill is negligible. It is estimated that less than 5 cubic yards (CY) of waste materials will be per year and assuming the waste will only constitute 25% of the monofill volume to allow for berms and cover material, there is sufficient volume within the existing monofill for at least another 5 years of use.

The soil material around the site is very porous therefore any rain or snowmelt on the site quickly percolates in the ground. Resultantly, the monofill does not contribute to sheet flow run off.

8.3. SITE ACCESS CONTROL

The JDTP is enclosed within a perimeter fence. All gates remain closed at all times. The public is not allowed on the grounds without a CBJ staff or contracted personnel escort.

8.4. TRAFFIC CONTROL

The site is controlled by gates and fencing so traffic is limited to CBJ vehicles and machinery. The gates and fencing prevents any other traffic from having access to the site. There is a small internal access road around the sewage solids monofill that allows the facility to be operated and maintained. There is typically no access by the public to or around the sewage solids monofill area.

Plant operators:

- Ensure that CBJ staff are on duty when the facility gate is open or any public is present.
- Ensure the facility is completely secure at the end of every work-shift and day.
- Ensure that the public is prohibited from access to the site except when a CBJ representative is with them. General viewing of the monofill activities is prohibited.
- Ensure no unauthorized dumping is completed in any section of the facility.
- Ensure that the access roads and on-site roads are kept passable.
- Ensure that signs are posted in appropriate areas of the facility.
- Ensure that signs are posted stating that all visitors to the facility must check in with CBJ staff.
- Maintain a readable sign at the entrance that includes the following:
 - Identification of the area as a permitted waste site, including permit number;
 - The name of the permittee, address and phone number to report problems;
 - Notify users that domestic and commercial waste are not accepted at the facility;

8.5. WASTE ACCEPTANCE POLICY

8.5.1. Waste Acceptance

The CBJ Wastewater Utility controls the materials that go into its sewage solids monofill facility. No solid wastes are accepted at the JDTP other than the waste stream collected by the wastewater system. General public and private wastes will not be accepted at the facility. See the Monitoring Plan for pathogen reduction and vector attraction reduction testing procedures.

CBJ uses a vactor truck to maintain the sewer collection system. As part of the system cleaning program, the trucks vacuum sand, grit, gravel, and sewage solids from the bottom of drop inlets, manholes, lines and lift stations. The waste from the trucks is taken to the JDTP and dumped into the vactor truck settling pond. When capacity is needed, the pond is dewatered and settled solids are removed.

Unacceptable wastes are wastes that are not acceptable for disposal at the facility, based on restriction in local, state or federal regulation, permit condition, or management discretion and which are not a direct result of the CBJ Wastewater Utility operations. Such wastes include but are not limited to:

- Liquid wastes (those wastes less than 10% solids by weight),
- Regulated hazardous waste, as defined by 40 CFR Part 261. Waste meeting this definition must be disposed of in accordance with 40 CFR Part 262, Standards Applicable to Generators of Hazardous Waste,
- Any waste that is deemed to have reasonable likelihood of damaging the facility or the processing equipment, or which is likely to pose a threat to health or safety or to cause a violation of any applicable permit or law.

8.5.2. Spontaneous Combustion Hazards

Spontaneous combustion is not likely to occur either in the vactor truck settling pond or in the monofill. The material in the pond generally has very high moisture content when it is dumped. The dewatered materials from the pond that are placed in the monofill are not materials which are likely to spontaneously combust. They are not stored in a dewatered form for more than one or two days before they are placed in the fill and buried.

8.6. WASTE PLACEMENT

In order to maximize monofill space, ensure protection of the environment and prevent nuisances, it is essential that an organized plan be followed for placing waste in the sewage solids monofill. Therefore JDTP operators will follow this plan of action:

8.6.1. General Requirements for Processing and Waste Placement Operations

JDTP operators will take steps to ensure the deposited waste is not allowed to deteriorate because of the following conditions:

- Surface run on water in contact with the waste in accordance with 18 AAC

60.225(a).

- Rainwater or snowmelt in contact with the waste.
- Ensure only one working face or cell for waste is exposed at any one time. The working face or cell shall be kept as small as practical.
- Ensure that litter, dust, odor, noise, traffic and other effects from the operations at the facility do not become a nuisance or hazard to the health, safety or property of persons at the facility or outside the facility boundary.
- The Operator shall keep the area accessible at all times through grading.
- Provide surface grading as needed to prevent surface ponding and runoff water from flowing over, into, or through deposited waste, or from accumulating in a disposal cell.
- Maintain a minimum horizontal separation distance of 50' between the designated portion of the monofill foot print and the property line of the JDTP facility.
- Ensure that an intermediate soil cover of at least 12" is applied to all areas of the monofill where waste has been buried and where the area will not be used for disposal within 90 days after the last waste deposited.
- Ensure that within 90 days of the waste deposited, a final cover is established to area that has been filled to the final design elevation. The Closure plan details the process and procedures for this action.
- Ensure that final and intermediate cover material is compacted, graded and maintained to prevent ponding and erosion and to minimize the amount of water passing through the cover material.

8.6.2. Storage

As described in the Waste Acceptance statement, no other wastes will be stored at the site for later placement into the sewage solids monofill. If unacceptable waste is identified it will be refused by the facility operators.

Operators will also ensure that waste is:

- Stored in a safe and sanitary manner that prevents a litter violation in accordance with 18 AAC 60.010(a).
- Stored in a manner that prevents the attraction or access of wildlife or disease vectors to the putrescible waste.
- Handled in ways which protect the wastes from vectors and exposure to weather prior to placement in the monofill.
- Stored in a manner as to prevent health hazards or polluted runoff water in accordance with 18 AAC 60.010(a) and 18 AAC 60.233(2).
- Stored in a manner which will not adversely affect threatened or endangered species in accordance with 18 AAC 60.470 (h).
- Stored in a manner which prevents odor nuisances.

8.6.3. Operating the Vector Pond

Vector trucks park on the concrete pad at the east end of the vector truck settling basin. They dump their loads into the basin. The solid materials remain in the basin to settle by gravity. Liquids are pumped back to the wastewater treatment plant for treatment and

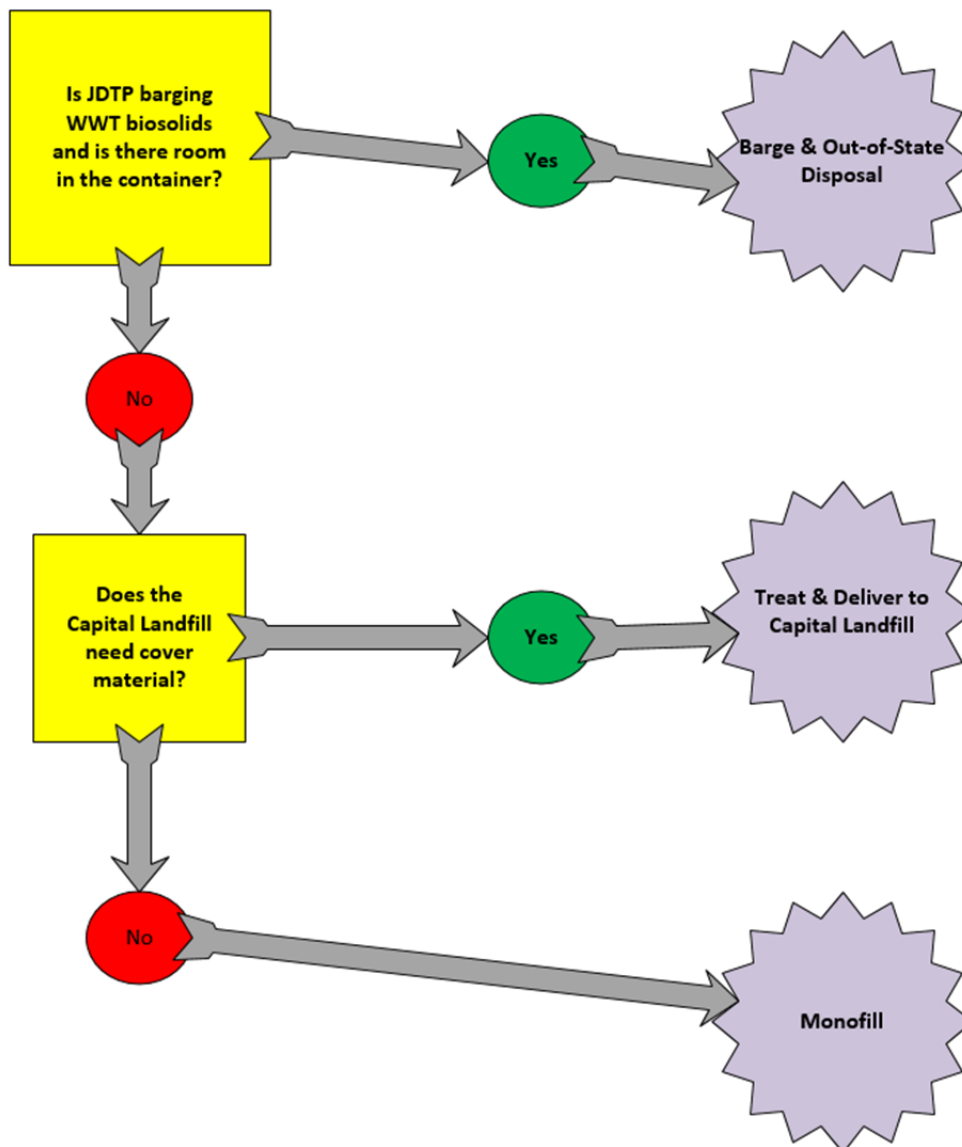
disposal. Solids that remain in the basin are further stabilized by anaerobic decomposition. Some liquids percolate into the soil and some evaporate.

8.6.4. Settle Solids Cleanout and Disposal Alternatives

Roughly once a year (usually in the late spring), the settled solids are removed from the pond to create more room (volumetric space) for additional vector trucks loads. Indifferent of the disposal method, the pond is prepared for excavation by:

- Pumping the liquids to the JDTP treatment basins using the pump on the west side of the pond or a portable trash pump.
- Liquid is added to the JDTP wastewater stream for treatment (as needed).
- Settled solids in the bottom of the pond are allowed to thicken and dry for a matter of days to achieve a minimum solids content of 10%.

Then the settled solids are treated and disposed of in one of three ways (described below) by following the flowchart of the alternatives.



8.6.4.1. Barge and Out-of-State Disposal

The CBJ wastewater treatment biosolids residuals are barged and landfilled in Oregon. These biosolids are shipped in bag-lined, watertight (on the bottom 4 feet) intermodal shipping containers.

Vactor pond settled solids can be added to the shipping containers before being barged off. Roughly 4-5 backhoe scoops of settled solids go into every container (as not to exceed the 50,000 pound total container weight). The containers are closed up and shipped to Oregon for final disposal.

When available, shipping via barge and out-of-state disposal is the preferred method of disposal for the settled solids/biosolids.

8.6.4.2. Capital Landfill Cover Use

When provided to the Capital Landfill for cover material, the settled solids will be treated to meet EPA's 40 CFR 503 Class B biosolids standards as described below and then delivered to the landfill after receiving approval to do so by the landfill supervisor. The following way is the procedure to treat the settled solids to meet EPA's 40 CFR 503 Class B biosolids standards:

- Add lime to the settled solids raising the pH to above 12 for 2 hours, then maintain a 11.5 pH for an additional 22 hours.
- The settled solids will be sampled and tested according to the Monitoring Plan. This testing will ensure that solids placed in the monofill contain no less than 10% by weight at temperatures above freezing, testing for TCLP and other supplementary constituents, and ensuring the material meets EPA 40 CFR 503 Class A or B standards for pathogen and vector attraction reductions.
- A backhoe fills the dump truck with the material for delivery to the landfill.

8.6.4.3. Sewage Solid Monofill Disposal and Operation

When neither the barge and out-of-state disposal or the landfill cover option is available to CBJ, the settled solids are treated to Class B standards and placed in the monofill in the following way:

- Add lime to the settled solids raising the pH to above 12 for 2 hours, then maintain a 11.5 pH for an additional 22 hours.
- The settled solids will be sampled and tested according to the Monitoring Plan. This testing will ensure that solids placed in the monofill contain no less than 10% by weight at temperatures above freezing, testing for TCLP and other supplementary constituents, and ensuring the material meets EPA 40 CFR 503 Class B biosolids standards for pathogen and vector attraction reductions.
- A backhoe excavator will be used to dig a trench in the top of the monofill with an area large enough to accept 80 to 100 cubic yards of material. The trench will be about 5' x 10' by 54' or some similar configuration capable of accepting 100 cubic yards of material. Excavated material from the trench will be temporarily stored adjacent to the open trench to later be used as cover

material.

- Settled solids from the basin will not be placed on the monofill outside surface faces. Only excess materials removed to make the trench and not use as cover material will be spread along the top and edges of the monofill.
- The Operator shall place the vector truck settling basin waste directly into the trench.
- Filling the trench may occur over about a three day period. At the end of each day while filling is in progress the open trench will be covered with a tarp (or other impervious membrane) to keep out rain and prevent a nuisance, odors, attract vectors or wildlife. When the total depth of the compacted lifts reaches the top of the trench, the Operator will cover the trench with a geotextile fabric.
- The fabric will then be covered with 12" of soils removed from the trench. This will ensure the entire monofill surface is covered with a 12" intermediate cover layer that is compacted.
- The top surface of the monofill will be graded so that it slopes for drainage purposes. This grading will ensure that water does not pond on top of the monofill and that any rain water or snowmelt will runoff the fill. The area around the monofill will be graded so that any sheet flow of rain water or snowmelt will be directed to the vector truck settling basin. This is to ensure there is no sheet flow of water off site.
- Side slopes will be made stable by forming to shallow grades and being compacted.
- As indicated by past experience at the site, disturbed areas of the monofill will rapidly re-vegetate naturally.
- The surface of the monofill will be observed during the scheduled visual monitoring program. If erosion or ponding begins to occur, Operators will regrade the site and spread a hardy Southeast Alaska grass mix over areas without grass cover.
- In the event any of the waste in the monofill becomes exposed or washes out of the monofill, Operators will take immediate measures to disinfect the affected area with lime, move the exposed material into the disposal cell and cover it with geotextile fabric and imported soils.
- After placement of material a final inspection of the site will be done to ensure the areas are clean, covered, well graded and in compliance with the Operations Plan.
- Closure of the monofill will be in accordance with the Closure plan. CBJ will provide closure of the site when the final elevation is reached and within 90 days of the last waste placement.

8.7. PLANS OF CONTROL

The facility is operated and monitored in compliance with the State of Alaska requirement regarding the control of impacts outside of the facility boundary in accordance with 18 AAC 60.233(2) , 18 AAC 60.420, and 18 AAC 60.470

The facility is operated to ensure that dust, odor, noise, traffic, and other effects from the

operation of the facility do not become a nuisance of hazard to public health, safety or welfare. The monofill is operated to prevent any unnecessary contamination of groundwater or surface water.

8.7.1. Groundwater Pollution

Groundwater monitoring was not required as part of either the 1997 or 2012 permit renewals. Appendix B: Monitoring, Records, and Reporting of Permit Number 9011-BA015 states that:

(3) Groundwater monitoring is not required at this facility. Exhibits "H" and "I" of your permit application provide satisfactory demonstration that the site does not endanger any aquifer of resource value.

8.7.2. Surface Water Pollution

Surface water control is addressed by grading of the monofill and the area around the monofill so that no surface water leaves the facility boundary from the monofill. Grading is towards the vector truck settling pond where surface water is returned to the JDTP for treatment and disposal.

8.7.3. Storm Water Control

The surface of the monofill has been graded to prevent erosion and ponding. The surface water control is such that it prevents surface water from flowing into the monofill and directs storm waters to the vector truck settling basin.

8.7.4. Dust Control

The monofill is usually kept moist from precipitation and does not generate dust. Additionally, the monofill supports plant growth which also provides dust control. The materials placed in the monofill are capped with a geotextile fabric and soils and so monofill material will not generate dust.

8.7.5. Noise

The monofill has 1 submerged pump that generates no noise (as long as it is operating properly). The noise associated with operating the monofill will come from heavy equipment moving the settled material from the vector truck settling basin to the monofill. This noise will only occur during normal working hours and roughly once every two years. Additionally, adjacent properties are used zoned for commercial and industrial uses.

8.7.6. Odor Control

All materials in the vector truck settling basin are kept covered with liquid until it is time to dewater the settled solids in the pond; so it does not usually generate odors. Wastewater treatment plants in general generate odors from time to time. If an odor complaint is

received JDTP staff will complete an odor complaint form, will follow up on resolution of the origin of the odor complaint, and will send ADEC a copy of the completed form.

8.7.7. Decomposition Gases

JDTP will prevent or correct a hazard from decomposition gas caused by the waste or its interaction with the environment. Explosive gas monitoring requirements were waived in the both the 1997 and 2012 Solid Waste Permit No. SWZA013-12 as follows:

“Explosive gas monitoring in buildings within 500 feet of the sewage solids monofill as required by 18 AAC 60.470(j)(3) is waived under this permit in accordance with 18 AAC 60.900(a)(1). The sewage solids monofill is constructed entirely above the surface grade and explosive gases are able to vent directly into the atmosphere without travelling through the subsurface. As such, the cost of the required gas monitoring would be significantly more than the benefit derived.”

8.7.8. Disease Vectors

No sightings of rodents have been reported. The monofill is covered with a geotextile fabric and 12” of soil after placement of material from the vector truck settling basin. This prevents access to the material by rodents or other disease vectors. An eradication program will be developed if rodents become an issue.

8.7.9. Wildlife Access

The operation of the monofill discourages many forms of wildlife from feeding on the material since they are very low in biodegradable organic materials. The JDTP plant site is completely fenced to keep large wildlife out of the facility. Bird numbers tend to be seasonal and are mostly aquatic. The monofill operations are timed to minimize the attraction of duck and gulls. This means that the fill operations are mostly scheduled in early spring when bird numbers are lower. Covering the material in the monofill keeps odors low and so it has not been attractive to bears or domestic animals.

8.7.10. Litter

Windblown litter is not an issue due to the nature of waste collected by the vector trucks. JDTP staff regularly observes the monofill and if any windblown materials originate from the monofill, it will be immediately covered with additional soil material. Plant operators will collect any litter on the site brought in by the wind or by other methods and dispose of it in their dumpster.

8.8. OPERATORS

8.8.1. State Certification

Employees working for the CBJ Wastewater Utility at the JDTP meet the State of Alaska

(ADEC) requirements for utility operator certifications. The Operators are trained, tested and certified in wastewater treatment and/or collection system operations.

The CBJ Wastewater Treatment Supervisor is the lead person responsible for record keeping and maintaining documents at the JDTP facility.

8.8.2. Training

Site personnel involved either directly or indirectly in the solid waste operations shall receive training. Such training will be done at regularly scheduled sessions, such as site safety meetings, and will be documented as to content and personnel. Such training will be tailored to the site and the specific personnel present, and may cover topics such as:

- Program Overview
- Responsibilities of Specific Personnel
- How to Identify Acceptable and Unacceptable Wastes
- How to Conduct a Visual Inspection
- What to do if an Unacceptable Waste is Found
- Specific Directives Concerning Operation of the Monofill

Section 9. Monitoring Plan

The monitoring plan must include sufficient detail to allow all monitoring to be completed in full compliance with the applicable regulations and permit conditions.

1.	Visual monitoring plan [18 AAC 60.210(b)(3)(D); 18 AAC 60.800(a)]
	a. Description of the procedures for visual monitoring of the monofill.
	b. Checklist or visual monitoring form including all applicable items in 18 AAC 60.800(a) and any additional items appropriate for the facility.
2.	Surface water monitoring plan (if required by DEC) [18 AAC 60.210(b)(3)(D); 18 AAC 60.810; 18 AAC 60.840]
	a. Information about topography and surface water flow at the monofill.
	b. A detailed map showing permanent sampling site locations and surface water flow direction.
	c. Identification of and information about background and compliance sampling sites, including an explanation of why each site was chosen.
	d. Specific information about sampling frequency and schedules.
	e. A list of constituents for which samples will be analyzed.
	f. Detailed monitoring procedures as outlined in 18 AAC 60.810(e).
	g. A Quality Assurance and Quality Control Plan providing specific details about sampling and testing methodology.
	h. A statement that monitoring reports will be submitted to DEC within 60 days of receiving laboratory data or by the date(s) stipulated in the permit.
3.	Groundwater monitoring plan (if applicable) [18 AAC 60.210(b)(3)(D); 18 AAC 60.217; 18 AAC 60.820; 18 AAC 60.825; 18 AAC 60.830; 18 AAC 60.840]
	a. Information about groundwater hydrology at the monofill including depth to groundwater, direction and velocity of flow, with supporting documentation.
	b. A detailed map showing well locations and groundwater flow direction and rate.
	c. Well drilling logs, soil boring logs and well installation information for all background and compliance wells.
	d. An explanation of how each groundwater monitoring well location was selected, including documentation such as geophysical reports, survey data or maps and any other data used to evaluate subsurface conditions at the site and to determine monitoring well placement.
	e. Specific information about sampling frequency and schedules.
	f. A list of constituents for which samples must be analyzed.
	g. Information about statistical methods that will be used in statistical analysis of the analytical data.
	h. A Quality Assurance and Quality Control Plan providing specific details about sampling and testing methodology.
	i. A statement that monitoring reports will be submitted to DEC within 60 days of receiving laboratory data or by the date(s) stipulated in the permit, and the reports will comply with the Groundwater Monitoring Checklist on the ADEC website at http://dec.alaska.gov/eh/sw/Monitoring.html .

4.	Explosive gas monitoring plan (if applicable) [18 AAC 60.210(b)(3)(D); 18 AAC 60.470(j)(3)]
	<p>a. Specific information about sampling locations, frequency, and schedules.</p> <p><u>NOTE: The owner or operator of a sewage solids monofill containing more than 2,500 cubic yards of solid waste must establish a continuous explosive gas monitoring station in any building closer than 500 feet from the solid waste disposal area.</u></p>
	b. Information about equipment and procedures used for explosive gas concentration measurements.
	c. Information about how explosive gas levels will be reported to ADEC.
5.	Thermal monitoring plan (if required by DEC) [18 AAC 60.210(b)(3)(D); 18 AAC 60.228(b)]
	a. A description of the procedures and equipment used for thermal monitoring of the monofill.
	b. Specific information about thermal monitoring frequency and schedules.
	c. Identification and information about the construction and placement of thermal monitoring wells.
	d. A detailed map showing thermal monitoring well locations.
	e. Information about how thermal monitoring results will be reported to DEC.
6.	Sewage solids monitoring plan [18 AAC 60.020; 18 AAC 60.470(b); 18 AAC 60.470(c); 18 AAC 60.470(d); 18 AAC 60.470(j)]
	<p>a. If the facility has no liner and leachate collection system, information regarding:</p> <ul style="list-style-type: none"> • The minimum distance from the sewage solids disposal area to the property line of the facility and the applicable maximum allowable concentration limits of arsenic, chromium, and nickel based on the tables in 18 AAC 60.470(c); and • The frequency of and procedures for documenting that the concentrations of arsenic, chromium, and nickel in the sewage solids do not exceed the maximum allowable concentrations.
	b. A description of the sampling frequency and procedures for conducting TCLP analysis and PCB analysis of the sewage solids.
	c. A description of how the moisture content of the sewage solids will be monitored to ensure the requirement of 18 AAC 60.470(b) is met.
	d. If sampling is required to demonstrate compliance with a particular pathogen reduction or vector attraction reduction method, an explanation of the sampling and analysis is required.

**JUNEAU-DOUGLAS WASTEWATER TREATMENT PLANT PERMIT RENEWAL APPLICATION,
PERMIT NO. SWZA013-22
SECTION 9. MONITORING PLAN**

9.1. PURPOSE

This plan outlines the program to be followed to conform with the State of Alaska solid waste regulations 18 AAC 60.800 through 18 AAC 60.860, which require a visual and surface water monitoring program. Other aspects of monitoring as related to monofill operations are prescribed in the Operations Plan for the facility.

9.2. VISUAL AND AIR MONITORING

Visual and air operational monitoring consists for daily informal and monthly formal visual check of the monofill area and adjacent beach at low tide. The form for completing these inspections, included at the end of this section, is used to record all observations and conditions. The requirement to complete the monthly inspection form has been included in the JDTP's maintenance management program.

Copies of the Visual Inspection and Monitoring Checklist for the Monofill Area will be available for ADEC inspection upon request. The CBJ Wastewater Utility will notify ADEC immediately if any significant conditions are observed during the visual monitoring.

Monofill inspections will be completed monthly or more frequently depending upon conditions at the facility. The visual inspection will be carried out using the visual monitoring checklist by a person who is familiar with the ADEC solid waste requirements in 18 AAC 60, with this monitoring plan, the closure plan and the operations plan. A JDTP Operator will conduct the inspection.

The inspection will consist of walking around the toe of the monofill, around active cells and along the beach outside the fenced area, documenting observations using the Visual Inspection and Monitoring Checklist. The visual inspection reports will consist of a brief summary of observations (completed Visual Inspection and Monitoring Checklist) and any actions taken.

At a minimum the inspections will check for the following:

- Visible damage to the top layers of the monofill cover system.
- Signs of potential damage to any component of the monofill from settling, ponding, leakage, combustion (e.g. steam or smoke), frost action, erosion, thawing of waste, or other natural processes or operations at the facility.
- Density and general condition of the vegetative cover.
- Excessive runoff or odors in the area.
- Any escape of waste or leachate.
- Any unauthorized waste disposal.
- Damage to the structural integrity of containment system.
- Evidence of death or stress to fish, wildlife or vegetation that might be caused by the facility.
- Runoff control structures and grading of the site are constructed and maintained to

facilitate effective runoff control and to prevent surface water from flowing into previously disposed or stored waste.

- Reports of evidence of disease vectors or wildlife access since the last visual inspection.
- Evidence of excess litter, odor, dust, noise or nuisances since the last visual inspection.

9.3. SOLID WASTE MONITORING

9.3.1. Percent Solids

Solids will be tested for percent solids by weight before placement into the monofill to ensure that the wastes are dewatered and contain at least 10% solids by weight. The samples are to be taken just prior to placement in the solid waste site.

9.3.2. Paint Filter Test

The solid waste to be placed in the monofill will be sampled and analyzed for the paint filter test in accordance with Standard Methods #9095B. 3 evenly-distributed samples of the dewatered solids will be collected for analysis preceding each excavation/monofill filling event.

9.3.3. TCLP

The solid waste placed in the monofill will be monitored and samples taken to determine compliance with the Toxicity Characteristic Leaching Procedure (TCLP) limits for metal listed in 40 CFR 261.24, Table 1 below. Monitoring for these constituents will occur once yearly.

Table 1 – TCLP limits for metals

Constituent	Maximum Concentration (mg/L)
Arsenic	5.0
Barium	100.0
Benzene	0.5
Cadmium	1.0
Chromium	5.0
Lead	5.0
Mercury	0.2
Selenium	1.0
Silver	5.0

If the solid waste exceeds TCLP limits for metals, the CBJ will hire a consultant to develop a plan for removal and disposal of monofill materials at an approved hazardous waste disposal facility.

9.3.4. Supplemental Sampling for an Unlined Monofill

When operating an unlined monofill, additional samples must be taken and analyzed to ensure compliance with 18 AAC 470 (c)(2). The CBJ unlined monofill is within 500 feet of the property boundary and there are substantially less than 330 tons over a year of sewage solids placed in the monofill. Therefore the constituents shown in Table 2 must be sampled at least annually and shall not exceed the maximum concentrations noted. Monitoring for these constituents will occur once yearly based on the guidelines listed in Table G of 18 AAC 60.470 (j).

Table 2 – Supplemental Sampling for an Unlined Monofill

Constituent	Maximum Concentration (mg/kg)
Arsenic	30
Chromium	200
Nickel	210

9.3.5. Pathogen Density and Vector Attraction Testing

The pathogen density requirements as set out in 40 CFR 503.32 and vector attraction reduction requirements as set out in 40 CFR 503.33(b)(1)-(b)(8) must be met, as discussed in the Operations Plan. Test procedures are discussed in section 9.6. Sample frequency will occur once yearly based on the guidelines listed in Table G of 18 AAC 60.470 (j).

To meet pathogen and vector attraction reduction requirements, samples of the settled solids (that have been dewatered) will be collected in 3 locations of the vector truck settling pond every half hour for the first 2 hours of lime addition/stabilization and then every six hours throughout the next remaining 22 hour stabilization period for both solids content and pH. At the end of the 24 hour period, seven representative samples shall be collected and analyzed for fecal coliform where the geometric mean of shall be less than either 2,000,000 MPN/gram of total solids (on a dry weight basis) or 2,000,000 CFU/gram of total solids (on a dry weight basis).

9.4. GROUNDWATER MONITORING

When this permit was first issued, CBJ conducted groundwater monitoring using the four wells installed at the site. After testing and analysis, the results were submitted to ADEC. CBJ Utilities requested and was given ADEC approval to discontinue groundwater monitoring. The monitoring wells remain in place.

The groundwater monitoring requirements were not required as part of the 1997 or 2012 permit renewals. Appendix B: Monitoring, Records, and Reporting of Permit Number 9011-BA015 stated that:

(3) Groundwater monitoring is not required at this facility. Exhibits "H" and "I" of your permit application provide satisfactory demonstration that the site does not endanger any aquifer of resource value.

9.5. SURFACE WATER MONITORING

JDTP has contoured the site surrounding the monofill so that stormwater and leachate will run back to the vector truck settling pond (as shown on the grading plan). The runoff from the site is fairly dispersed with few defined drainage patterns or ditches.

If during the visual observations leachate is observed running off the site, a surface water monitoring program will be initiated. The program will follow the steps and processes defined in this Monitoring Plan.

A sampling site will be established where the runoff is observed and at a point which is not greater than 50 feet from the toe of the slope of the monofill fill area and on land owned by CBJ. This sampling point will be established and its location documented following this Monitoring Plan.

CBJ anticipates contracting the surface water monitoring to an authorized laboratory or consultant. This contracted agent will follow an established Quality Assurance and Quality Control Plan for sampling and analysis.

9.6. TEST PROCEDURES

Test procedures for analysis of pollutants shall conform to methods cited in 18 AAC 70.020(c) as amended on February 5, 2017, and in the Alaska Water Quality Criteria Manual for Toxic and Other Deleterious Organic and Inorganic Substances, dated December 12, 2008 and adopted by reference using EPA methods for the following listed elements at the following corresponding reporting concentration and/or units.

The parameters to be monitored are shown in Table 3. All metals with the exception of mercury shall be analyzed and reported using EPA method 200.8 for unfiltered total recoverable methods. Mercury shall be analyzed and reported using EPA method 245.1.

JDTP shall conduct water monitoring in accordance with approved QA/QC procedures as cited in this Monitoring Plan.

Table 3 – Water Quality Monitoring Parameters

Parameter	Units
Estimated Flow	CFS or GPM
Visual Observation	Odor, Texture, Growth etc.
pH	pH Units
Conductivity	(mS/m)
Temperature	Degrees F
Color	Cobalt Units
Dissolved Oxygen	mg/L
Turbidity	NTU
Hardness	mg/L
COD	mg/L
TSS	mg/L
Cadmium	µg/L
Chromium	µg/L
Mercury	µg/L
Arsenic	µg/L
Copper	µg/L
Lead	µg/L
Iron	µg/L
Nickel	µg/L
Selenium	µg/L
Zinc	µg/L
Total Coliform	FC/100 mL or MPN/100mL

The JDTP shall submit with the results of the analysis:

- Recorded National Weather Service weather information for the day samples were taken and for the two days before samples were taken.
- Date and time samples were taken.

9.7. REPORTING

All records and information will be submitted to ADEC in both hard copy and electronic versions. Electronic versions will be in a format that is acceptable to ADEC.

Analytical data will be submitted once a year in an annual report after completing a quality assurance review and internal data analysis. The annual report will be submitted by February each year. Whenever data exceeds standards the Department of Environmental Conservation will be informed within 30 days of receiving data from the laboratory. ADEC will determine if further sampling is needed in response to an exceedance of the Water Quality Standards.

The reports of exceedances will be submitted with a cover letter indicating where water quality standard and other standards are exceeded. If water quality standards have been exceeded the cover letter will include the following:

- The extent of contamination.
- If migration from the facility is the cause of the change in water quality.

- Evaluate whether the water quality standards in 18 AAC 70 are threatened or exceeded at the point of compliance selected under 18 AAC 60.810.

JDTP shall retain all records and information resulting from monitoring activities for at least 5 years. The results of analyses will be submitted to ADEC annually unless CBJ discovers that water quality standards have been exceeded (warranting a more timely submission).

9.8. GENERAL FIELD PRACTICES

9.8.1. Field Logbooks

Permanently bound books with waterproof paper shall be used as field logbooks. The pages of the logbook should be numbered consecutively and should not be removed for any reason. Entries will be made in waterproof, indelible ink.

Logbooks will document the procedures performed by field personnel. Each entry should be dated and legible, and should contain accurate and complete documentation of the individual's activities. Documentation in the field logbook will be at a level of detail sufficient to explain and reconstruct field activities without relying on recollection by the field team members.

Uneventful samplings will require documentation of only the sampling time and date and the sampler's name.

9.8.2. Sample Identification and Labeling

To provide a sample tracking mechanism, each sample being sent to the analytical laboratory will be given a sample identification number so that:

- The first alphanumeric represents the sampling location.
- The second set of digits represents the sampling date.

Duplicate samples shall be given a "D" in addition to the sample location. The samples they duplicate shall be recorded in the field logbook. At a minimum the sample label will contain the sample ID, the date and time of collection, the sampler's initials and any preservative added.

9.8.3. Sample Containers

Samples (primary, as well as quality assurance/quality control) will be collected in glass or plastic containers supplied by the contract analytical laboratory. The containers will have screw-type lids to ensure adequate sealing of the bottles. Teflon inserts located inside the lids of the containers will prevent reaction with the lid and improve quality of the seal.

The containers will be pre-cleaned and certified under chain of custody. Commercially available pre-cleaned jars are acceptable. The contract laboratory's bottle shipment documentation will record batch numbers for the bottles. With this documentation, bottles can be traced and bottle wash analyses reviewed. The bottle wash analyses will be

retained in the analytical laboratory's project file.

9.8.4. Sample Preservation

Prior to shipping sample bottles to the field, the analytical laboratory will add any required preservatives to the sample bottles. The laboratory will affix waterproof labels to the bottles on which the type of analysis, and the type and amount of preservative will be written.

Sample preservation procedures are used to maintain the original character of analyses during storage and shipment. Regardless of the nature of the sample, absolute stability for all constituents cannot be achieved. Preservation techniques, such as pH control and refrigeration, may retard physiochemical and biochemical changes. As a general rule, analyzing the sample as soon as possible is the best way to minimize physiochemical and biochemical changes.

Samples will be placed in the appropriate sample container and refrigerated (on ice or an ice substitute and placed in a cooler) immediately upon sample collection. The analytical laboratory will meet all specified holding times and should make every effort to prepare and analyze the sample immediately after receipt.

9.8.5. Sample Storage

Samples will be placed in secure, on-site storage, or remain in the possession of the sampling personnel until the samples are shipped to the laboratory. Immediately after collection and during shipment to the analytical laboratory, samples will be stored in coolers with ice or an ice substitute at 4°C. Either ice packaged in plastic storage bags or prepackaged ice substitute will be used to maintain the temperature in the shipping containers at approximately 4°C. Ice will be replenished as necessary to ensure adequate cooling of samples during storage and shipping.

9.8.6. Chain-of-Custody Procedures

Verifiable sample custody is an integral part of all field and laboratory operations. The primary purpose of the chain-of-custody procedures is to document the possession of the samples from collection through storage and analysis to reporting. Chain-of-custody forms will become the permanent records of sample handling and shipment.

Chain-of-custody forms will be filled out starting with the first sample of each batch. Each chain-of-custody form will contain the following information:

- Sample identification numbers
- Date and time of sampling
- Type of sample and number of sample containers associated with each sampling point
- List of analyses requested
- Name and signature of sampling personnel
- Spaces for transfer of custody acknowledgment

The chain-of-custody form that accompanies samples from the time of sample collection will be signed and dated, placed in a Ziploc bag and taped to the inside lid of one of the coolers.

Samples will be sent to the laboratory via overnight courier or hand carried to the local laboratory. The shipping agent will not enter into the formal chain-of-custody procedures and therefore will not sign the chain-of-custody form. Copies of the bills of lading provided by the shipping agent will be kept with the chain-of-custody forms in order to document shipping procedures.

9.8.7. Sample Packaging and Shipping

The procedures for and material used for sample packaging must adequately protect the sample container from accidental breakage during shipment. Glass sample containers will be wrapped and cushioned in inert packing material such as Styrofoam, closed-cell foam packing material or plastic bubble wrap. Plastic sample containers do not require individual cushioning material, but should be well packed to prevent movement during transport. Caps will be screwed on tightly. Ice or ice substitutes shall be placed in the shipping cooler in a manner that ensures adequate and equal cooling for all samples.

Sample containers will be placed inside a strong shipping container, such as a metal or plastic picnic cooler with a hard plastic liner. The shipping container should be sufficient to prevent any leaks or spills of ice water, or potentially broken sample containers. The drainage hole in the bottom of the cooler will be taped shut so that the contents from potentially broken containers of prepackaged ice, ice substitute, or sample will not escape. The shipping container will be adequately cleaned between shipments to prevent cross-contamination of samples.

Deliveries that will arrive at a laboratory or at a courier office to be picked up by laboratory personnel will be arranged with the laboratory before shipping.

9.9. QUALITY ASSURANCE AND QUALITY CONTROL PROCEDURES

This section identifies the field and laboratory QC samples, the laboratory procedures and associated reporting limits and bottle requirements, and the data review and reporting process.

9.9.1. Quality Control Samples

Field duplicates are samples collected simultaneously or sequentially from the same sample location, using identical sample methods. The samples equally represent as nearly as possible the medium being sampled, and may provide information on the variance of chemicals at a sampling location and the consistency of sampling techniques.

At a minimum, field duplicates will be collected and submitted for analysis at a rate of one field duplicate for every twenty (20) primary samples collected (5% of the samples).

9.9.2. Laboratory Matrix Spike

A matrix spike is an environmental sample to which known concentrations of analyses have been added. Results are expressed as percent recovery of the known amount spiked. The matrix spike is used to evaluate the effect of the sample matrix on the accuracy of the analysis.

9.9.3. Laboratory Matrix Spike Duplicate

A matrix spike duplicate is a split of the environmental sample used for the matrix spike that is spiked with known concentrations of analyses.

The matrix spike and matrix spike duplicate are processed separately, but in identical fashion and the results are compared to evaluate the precision and accuracy of laboratory results. Results are expressed as percent recovery and as relative percent difference between the matrix spike and the matrix spike duplicate percent recoveries.

The frequency of matrix spike/matrix spike duplicates will equal or exceed 5% of the total number of primary samples for each analytical method and at least one per sample batch.

9.9.4. Laboratory Surrogates

A surrogate is a compound or compounds added to every blank, sample, matrix spike, matrix spike duplicate and standard as specified in the analytical methodology. The results are used to evaluate the accuracy of analytical measurement on a sample specific basis. Surrogates are expressed in percent recovery of the surrogate spike.

Method or Preparation Blank

A method blank consists of analyte-free deionized water. The method blank is carried through each step of the analytical method. The method blank data will be used to assess potential contamination introduced during the laboratory analysis. The frequency of method blanks will equal or exceed 5% of the total number of primary samples for each analytical method and at least one per batch of samples.

9.9.5. Laboratory Control Samples

Laboratory control samples are well characterized laboratory generated samples used to monitor the laboratory's day to day performance of routine analytical methods. The results of the laboratory control samples are compared to a well-defined laboratory acceptance criteria to determine whether the laboratory system is operating within control limits. Evaluating laboratory operation with laboratory control samples results, as opposed to matrix spike and matrix spike duplicate results offers the advantage of being able to differentiate low recoveries due to procedural errors from those due to matrix effect.

9.9.6. Analytical Procedures

The laboratory test procedures for analysis of pollutants shall conform to methods cited in 18 AAC 70.020(c) as amended on February 5, 2017, and in the Alaska Water Quality Criteria Manual for Toxic and Other Deleterious Organic and Inorganic Substances, dated December 12, 2008 and adopted by reference using EPA methods for the following listed elements at the following corresponding reporting concentration and/or units.

All metals with the exception of mercury shall be analyzed and reported using EPA method 200.8 for unfiltered total recoverable methods. Mercury shall be analyzed and reported using EPA method 245.1.

9.9.7. Surface Water Sampling Protocol

Field personnel will conduct all surface water sampling in accordance with the following procedures to ensure that the samples are representative of surface water quality in the vicinity of the monofill.

- Samplers will wear clean latex gloves while collecting surface water samples.
- Samples will be collected from the sampling location furthest downstream while within the facility boundary.
- Surface water samples will be collected by immersing the containers in free flowing water. Samples should not be collected from stagnant pools. A determination will be made in the field by the samplers as to whether or not sufficient flow is available to ensure proper collection of a representative sample. If flow is not sufficient, the sampler will document this in the field logbook and move to the next sample location.
- Care will be taken to minimize the amount of sediment and/or any organic material collected along with the water sample. Field personnel will also ensure that sample containers are immersed in such a way that preservatives in the sample containers are not emptied into the surface water during the sample collection process.
- Care will be taken not to disturb water flowing upstream of the sampling point prior to collecting the sample.
- Analytical samples will be collected first, followed by samples for field water quality measurements at each site.
- Analytical samples will be collected in laboratory supplied containers.
- Samples for field water quality measurements will be collected in laboratory supplied jars or bottles. These containers will be disposed of after field parameters have been measured.
- All samples will be stored at 4°C during shipping. Samples will be shipped with trip blanks.
- All coolers will be packed and labeled according to DOT/IATA protocols.

9.9.8. Data Reduction, Review and Reporting

The analytical data generated by the laboratory will be checked for accuracy, precision, and completeness.

The first level of data review will be conducted by the data reviewer in the analytical laboratory who has the initial responsibility for the correctness and completeness of the data.

Data will be generated and reduced by the following laboratory protocols. Data will also undergo independent review as described below. The review results will allow evaluation of specific criteria as necessary, such as:

- Accuracy through evaluation of spike sample recoveries, laboratory control samples and surrogate spike recoveries.
- Analysis of precision through evaluation of laboratory duplicates or matrix spike duplicates analytical results.
- Representativeness through evaluation of duplicate sample precision.
- Comparability through evaluation of sample specific reporting limits, units of measure, and adherence to specified analytical methods.
- Completeness through evaluation of the overall analytical completeness and presence of valid sample data for critical samples.

9.9.9. Reporting

The laboratory will provide a report with each analytical data package. Electronic copies of the data will also be submitted in a format that is consistent with ADEC requirement for data submission. In addition, all associated raw data will be archived by the laboratory for possible future use. The reports will include the following hard copy information:

- Cover sheet listing the samples included in the report.
- Narrative comments describing problems encountered in analysis and identification of any analyses not meeting QC criteria including holding times.
- Chain-of-Custody forms.
- Tabulated results of compounds identified and quantified with reporting limits for all analyses.
- Analytical results for QC sample spikes, sample duplicates, and laboratory control samples.

After the field work has been completed and final analyses have been completed and checked, a final data quality summary report will be prepared. The report will summarize the quality assurance information, indicating any corrective actions taken. The data quality summary report will be included in the project file.

9.10. CORRECTIVE ACTION PLAN

The following outlines the responsibilities and procedures required if damage to the monofill is observed or if improper waste is disposed of at the monofill site.

9.10.1. CBJ Response

If a structural change or damage to the facility occurs, or a violation of a permit condition occurs or if any part of the operation is observed during an inspection by ADEC or CBJ that is not consistent with this plan, CBJ will take action to correct the change, damage or

violation to prevent the escape of waste or leachate and to clean up any waste that might have been disposed of in an unauthorized manner.

9.10.2. Monofill Repair

Damage that occurs to the surface or slopes of the active or closed portions of the monofill will be documented and reported to the CBJ Wastewater Treatment Plant Senior Operator. The Senior Operator will be responsible for implementing corrective action and using onsite heavy equipment and materials.

Corrective action is expected to include, but is not limited to, stabilizing slumping or eroded slopes, surface grading to prevent ponding of water and subsequent infiltration through the cover material, and collection and proper disposal of waste exposed due to damage to the slopes or cover material, repair to surface drainage to ensure all surface water will flow to the vector truck settling basin.

Monthly Visual Inspection & Monitoring Check List for the Monofill Area

Juneau-Douglas Wastewater Treatment Plant, Solid Waste Disposal Permit No: SWZA013 -22

Visual Inspection - include comments and actions taken.			
Date & time inspected			
Inspected by:			
Low Tide Level - schedule for lowest tide possible	ft.@	hrs.	
Appx. Wind Direction and Speed mph			
Weather Conditions & Temperature		°F	
Fence condition			
Overall condition of monofill site			
Is the area free of litter ?	<input type="checkbox"/> Yes	<input type="checkbox"/> No	
Any signs of erosion around the monofill area?	<input type="checkbox"/> Yes	<input type="checkbox"/> No	
Run-on control contour grading constructed and maintained to facilitate effective run-off and prevent surface water run-on from flowing back into the storage cells in the monofill area?	<input type="checkbox"/> Yes	<input type="checkbox"/> No	
Any ponding on top of the monofill area?	<input type="checkbox"/> Yes	<input type="checkbox"/> No	
Is the monofill area producing odors, or dust, ?	<input type="checkbox"/> Yes	<input type="checkbox"/> No	
Is the monofill area attracting disease vectors or wildlife since the last inspection?	<input type="checkbox"/> Yes	<input type="checkbox"/> No	
Any evidence of death or stress to fish, wildlife, or vegetation that may be caused by the monofill site?	<input type="checkbox"/> Yes	<input type="checkbox"/> No	
Does the monofill area have adequate vegetation?	<input type="checkbox"/> Yes	<input type="checkbox"/> No	
Any visible damage to the containment area?	<input type="checkbox"/> Yes	<input type="checkbox"/> No	
Any erosion of the beach fringe between the solid waste area and the beach? If yes, report to the Plant Supervisor immediately with an attached COPY of this completed form.	<input type="checkbox"/> Yes	<input type="checkbox"/> No	
Any visible particulate matter, waste or leachate leaving the Plant property? If yes, report to the Plant Supervisor immediately with an attached COPY of this completed form.	<input type="checkbox"/> Yes	<input type="checkbox"/> No	
Any unusual conditions that may be caused by the monofill area ? If yes, Report to the Plant Supervisor immediately with an attached COPY of this of this completed form.	<input type="checkbox"/> Yes	<input type="checkbox"/> No	
Any unusual conditions that might impact the monofill area? If yes, Report to the Plant Supervisor immediately with an attached COPY of this completed form.	<input type="checkbox"/> Yes	<input type="checkbox"/> No	

Monitoring & Testing Frequency		
Visual Inspections		Once per month
TCLP	- Proir to moving dewatered solids to the monofill area.	Once every 1-2 years.
Total Metals	- Proir to moving dewatered solids to the monofill area.	Once every 1-2 years.
Total Solids > 10% by weight	- Proir to moving dewatered solids to the monofill area.	Once every 1-2 years.

Monitoring & Testing	Date sampled:	Sampled by:	Date tested:	Tested by:	Results within acceptable limits?	Indicate sample points on the attached site map
TCLP					<input type="checkbox"/> Yes <input type="checkbox"/> No	
*Total Metals					<input type="checkbox"/> Yes <input type="checkbox"/> No	
Total Solids					<input type="checkbox"/> Yes <input type="checkbox"/> No	

The TCLP and Total Metals parameters are listed on the laboratory chain of custody form and in the Solid Waste Permit Part Ten: Monitoring Plan.

* Visual inspections will be conducted informally on a daily basis. Once a month a visual inspection of the facility will be conducted and recorded on the monthly visual inspection form. **During adverse weather conditions such as large storm events the site will be monitored closely.**

** Total metals will be performed on surface water samples if leachate or run-off from the facility is found through visual monitoring to go beyond 50' from the site footprint.

Section 10. Closure Plan and Cost Estimate

It is understood that the closure plan submitted with the permit application will be conceptual and may change throughout the active life of the facility. A detailed closure plan for a sewage solids monofill must be submitted and approved by DEC at least 180 days before closure. The closure plan **must include** the following information.

1.	<p>Description of the closure process [18 AAC 60.210(b)(3)(E); 18 AAC 60.210(b)(6); 18 AAC 60.245; 18 AAC 60.270; 18 AAC 60.470(n); 18 AAC 60.470(o); 18 AAC 60.490]</p>
	<p>a. A description of the final cover and appearance of the facility meeting the standards of 18 AAC 60.470(n) and (o).</p>
	<p>b. A description of the methods and procedures for final cover installation.</p>
	<p>c. A timeline or schedule for all activities needed to complete closure.</p>
	<p>d. A description of the anticipated post closure (future) use of the property.</p>
	<p>e. A description and map of proposed survey monuments or permanent markers.</p>
	<p>f. A statement of how DEC will be notified that the requirements of 18 AAC 60.270 and 18 AAC 60.490 have been met.</p>
	<p>g. If required, a discussion of how the leachate collection system will be operated and maintained for at least 3 years after the monofill closes.</p>
	<p>h. If required, a description of the system used to monitor for methane gas.</p>
	<p>i. A discussion of how the public access to the monofill will be restricted for at least 3 years after the facility closes.</p>
2.	<p>Financial information (if required by DEC) [18 AAC 60.210(b)(5); 18 AAC 60.210(b)(3)(F); 18 AAC 60.265]</p>
	<p>a. The total present-day equivalent cost estimate for an independent contractor (do not assume onsite use of any material or machinery) to close the facility. A quote from a consultant or calculation showing all relevant operations for closure is required. The State of Virginia has developed the Monofill Closure/Post-Closure Cost Estimate Worksheet (CEW-01 and CEW-02) in Excel available online at http://www.deq.virginia.gov/Programs/LandProtectionRevitalization/Forms.aspx. Please note that you need to complete both tabs, but only sections relevant to your facility.</p>
	<p>b. The total present-day equivalent cost estimate for an independent contractor to perform post-closure care of the facility.</p>
	<p>c. Demonstration of the mechanism of financial responsibility to cover the cost of closing the monofill and post-closure care. Proof of financial responsibility may be demonstrated by self-insurance, insurance, or other guarantee approved by DEC.</p>

**JUNEAU-DOUGLAS WASTEWATER TREATMENT PLANT PERMIT RENEWAL APPLICATION,
PERMIT NO. SWZA013-22
SECTION 10. CLOSURE PLAN**

10.1. PURPOSE

The objective of this closure plan is to satisfy the requirements of the monofill closure regulations in accordance with 18 AAC 60.470 (n) and (o) and to provide a basis for the design of the final closure plan for the monofill. This plan will be used as the basis for the grading, final cover systems, surface water control, erosion control and monitoring.

10.2. MONOFILL REGULATORY FRAMEWORK

18 AAC 60.470 (n) and (o) Closure Requirements for a Sewage Solids Monofill states the following:

(n) In addition to the requirements of 18 AAC 60.245, the Owner or Operator of a sewage solids monofill shall submit a written closure and post-closure plan to the department at least 180 days before a monofill will be closed and shall include, at a minimum,

- 1) A description of the final cover and how it will be designed to meet the requirements of (o) of this section, prevent the release of pathogens or hazardous constituents, account for settling or subsidence of the monofill, and resist erosion to prevent damage to the final cover;*
- 2) A discussion of how the leachate collection system will be operated and maintained for at least three years after the monofill closes, if the monofill has a liner and a leachate collection system;*
- 3) A description of the system used to monitor for methane gas as required by (j)(3) of this section; and*
- 4) A discussion of how public access to the monofill will be restricted for at least three years after the facility is closed.*

(o) The final cover must:

- 1) Consist of soil or another material approved by the Department;*
- 2) Be at least 24 inches thick or another thickness approved by the Department;*
- 3) Be graded to promote drainage without erosion or ponding; and*
- 4) Be revegetated.*

10.3. USE OF THE PROPERTY

CBJ has plans to continue using the JDTP site for its wastewater treatment plant and downtown snow storage/disposal facility. This draft closure plan for the monofill is consistent with these intended future uses.

10.4. CLOSURE CONCEPT MONOFILL

It is anticipated that the monofill should have sufficient capacity to last until 2022. When it is time, the monofill will be closed in-place.

10.5. FINAL APPEARANCE

Ultimate closure of the area will include grading and shaping the site to control surface runoff and for aesthetics. The area will be covered with approximately 24" of clean topsoil spread evenly over the area. The materials will be lightly compacted and revegetated with a mixture of local grasses. The final appearance will be that of a field of wild grasses.

10.6. ANTICIPATED POST-CLOSURE USE

The monofill site will remain within the fenced area of the JDTP.

10.7. SURFACE WATER CONTROL

The final grading and stormwater control will be established during final design of the closure plan with cover grading being the primary method of surface water control.

10.8. COVER

The proposed final cover will incorporate a low permeability soil layer (no additional membrane will be installed). The monofill cover system incorporates both the cover design and appurtenant structures to control drainage and minimize erosion. The cover will also be designed to control surface water infiltration and gas migration through the monofill cap. Appurtenant structures will provide erosion and sedimentation control, site drainage and site access around the monofill cap.

The final cover will extend slightly beyond the limits of the monofill footprint after regrading.

10.9. VEGETATION

The effectiveness of any cover is limited by the adequacy of the vegetative stand established. Aspects to consider when planning for maximum stand establishment include planting dates, supplemental irrigation, fertilizer, weed control, and application methods. These will be established as part of final closure plan design.

10.9.1. Planting Dates

Optimal planting dates for grass species are May 15 through June 15. Planting should not occur later than August to allow for establishment of the cover prior to winter. Supplemental irrigation is not anticipated to be required.

It is planned that the topsoil will not be placed until conditions are favorable for planting. If placement of the cover occurs after early August, it is planned that the topsoil will be placed the following year prior to the next optimal planting season to avoid erosion of the unstabilized topsoil.

Any temporary stormwater and sediment control measures for construction will be maintained until suitable vegetation cover can be established. In the spring following planting, any eroded area will be repaired by reseeding.

10.9.2. Fertilizer

Fertilizer may be needed at the time of seeding at rates that will be determined based on a nutrient analysis of the topsoil material. Standard specifications for roadside seeding include the following:

- Total Nitrogen as N 30 lbs/acre
- Phosphoric Acid as P 30 lbs/acre
- Soluble Potash as K 30 lbs/acre

These figures may be adjusted based on the nutrient analysis. The high rainfall in Juneau may cause leaching of applied fertilizers, especially nitrogen. Nitrogen will be applied in slow release formulations. The nutrient analysis of the topsoil will be used to assess available macronutrients (nitrogen, phosphorus and potassium) and micronutrients (calcium, magnesium, sodium, boron, copper, manganese, sulfur and zinc).

In addition to fertilizers, application of lime may be necessary to adjust the soil pH. The topsoil pH shall be analyzed and adjusted to a pH of 6 to 7 prior to planting. The continued decomposition of the topsoil should cause the pH to decrease with time. Should the vegetative cover fail to thrive, additional soil testing might be required to determine fertilizer and pH adjustment requirements.

10.9.3. Seed and Fertilizer Application

The seed mix that will be used will consist of:

- 33% Reed Canary Grass
- 33% Creeping Foxtail
- 17% White Dutch Clover
- 17% Annual Rye Grass

Grass seed and fertilizer will be applied by broadcast methods, followed by placement of a jute mat on any steeper slopes. The seeds should be planted at a depth of about ½". This

can be accomplished by lightly raking and compacting the broadcasted seed. Alternatively, the seed/fertilizer mix may be hydroseeded. Mulch should be applied to the seeded cover material, to retain moisture and to prevent dislocation of the seed mix prior to germination. Straw mulch may be used if the seeds are broadcast. Wood cellulose fiber with a tackifier may be applied by the hydroseeder following hydroseeding.

10.9.4. Maintenance of Vegetative Cover

The vegetative cover may require additional low level fertilization in subsequent years to maintain a healthy stand of grass. Also some reseeded may be necessary following the first winter if inadequate germination and stand establishment is achieved.

The health and adequacy of the vegetative cover will be assessed early in the growing season (May-June) following the first winter after initial planting. If the vegetative cover has not become well established, a nutrient analysis of the soil will be performed to determine if nutrient deficiencies are contributing to the poor stand. Nutrient deficiencies identified by the analysis will be corrected by fertilization rates determined by the analysis. The number of samples required will be determined based on visual assessment of the vegetative cover. A maximum of four samples is anticipated to characterize the soil fertility of the area with both poor and adequate vegetative cover.

Any area of the cover that are bare due to failure of the grass or clover seed to germinate, or due to seeds having become dislodged by erosion, will be reseeded at original planting rates and mulched.

10.10. POST CLOSURE MONOFILL MONITORING

A Post Closure Monitoring Plan which outlines the annual visual monitoring plan to be conducted at the site will be included in the final closure plan. In accordance with 18 AAC 60.395 (c), CBJ will monitor the site for settlement, erosion, and vegetative success for 60 months post closure of the monofill.

10.11. LOCATION OF MONUMENTS AND DEED NOTATION

The JDTP site has a survey monument along Thane Road.

CBJ will record a notation on the deed for the property in accordance with 18 AAC 490 (a) which states:

The notation on the deed or other instrument must explain, in perpetuity, to any potential purchaser or leaseholder of the property:

- 1) *That the land has been used as a monofill;*
- 2) *The type of waste that was placed in the monofill;*
- 3) *The geographic boundaries of the waste management areas; and*
- 4) *Details of any final cover, cap, or other structures or devices installed as part of closure.*

10.12. NOTIFICATION

Following completion of monofill closure, a certification or declaration of construction signed by a registered professional engineer in the State of Alaska will be provided to verify that the closure has been complete in accordance with the final engineering plans and closure plan. A notation will be made on the property deed notifying any potential purchaser of the property that the land has been used as a monofill and that its use is restricted. The construction certification and deed notation will be completed in accordance with 18 AAC 60.390 (b).

10.13. CLOSURE COSTS

Closure activities are anticipated to be completed by CBJ staff for the rough costs of:

Biosolids Cover Material	\$25,000
Topsoil and Hydroseeding Materials	\$50,000
Site Grading & Seeding Labor	\$15,000
ESTIMATED TOTAL	\$90,000

If third-party, independent contractors were to do the closure work, it is anticipated the CBJ would pay closer to \$162,000 (as shown in the attached worksheet CEW-01).

10.14. POST-CLOSURE COSTS

Post closure activities are anticipated to be completed by CBJ staff for the rough costs of:

Topsoil and Hydroseeding Materials	\$ 5,000
Site Grading & Seeding Labor	\$15,000
Engineering Certification	\$ 2,000
ESTIMATED TOTAL	\$22,000

If third-party, independent contractors were to do both the post-closure work, it is anticipated the CBJ would pay closer to \$48,000 (as shown in the attached worksheet CEW-02).

10.15. FUNDING

The overall financial status of the CBJ Wastewater Utility (as of 07 March 2017), shown in Table 4 below, is based off the current utility rate model. Included in the table is funding for operation and maintenance of the existing monofill until design and construction of a new vector dump facility (and closure and post-closure) can be completed. You will also note the Utility's ability to maintain a \$2.8M minimum fund balance through FY24.

Table 4 – CBJ WW Financial Status

Year	Starting Fund Balance	Revenue			Expense			Ending Fund Balance
		WW Utility Reserve	DEC Loans	Sales Tax	CIP Spending	Debt Service	Operating Costs	
FY15	8,265,804	10,088,393	23,400	--	23,400	645,387	8,333,707	9,538,168
FY16	9,538,168	11,417,877	10,000,000	--	13,940,000	581,582	8,218,974	8,361,200
FY17	8,361,200	11,191,700	10,000,000	--	10,550,000	573,300	10,413,700	8,015,900
FY18	8,015,900	12,042,900	--	--	4,815,000	513,100	10,539,700	4,191,000
FY19	4,191,000	13,977,368	--	4,500,000	5,845,000	600,662	10,396,803	5,825,903
FY20	5,825,903	13,982,226	--	4,500,000	3,225,000	2,192,645	10,664,247	8,226,237
FY21	8,226,237	14,025,874	--	4,500,000	2,815,000	2,151,840	10,940,014	10,845,257
FY22	10,845,257	14,074,796	--	4,500,000	2,500,000	2,144,315	11,224,424	13,551,314
FY23	13,551,314	14,142,859	--	4,500,000	3,400,000	2,136,791	11,517,799	15,139,583
FY24	15,139,583	14,216,575	--	--	3,300,000	2,025,266	11,813,437	12,217,455

Worksheet CEW-01: FORMAT FOR THE ESTIMATION OF CLOSURE COSTS

FILL IN THE BOXES. THE REST WILL BE CALCULATED FOR YOU

Soil Cap Components

I. Slope & Fill

		Calculation or Conversion	
a.	Area to be capped		
	<input type="text" value="0.28"/> acres	x 4,840yd ² /ac	1,355 yd ²
b.	Depth of soil needed for slope and fill		
	<input type="text" value="2"/> inches	x 1yd/36in	0.06 yd
c.	Quantity of soil needed	a x b	75 yd ³
d.	Percentage of soil from off-site		
	<input type="text" value="100%"/>		
e.	Purchase unit cost for off-site material		
	<input type="text" value="\$55.00"/> /yd ³		
f.	Percentage of soil from on-site	(1 - d)	0%
g.	Excavation unit cost (on-site material)		
	<input type="text" value="\$40.00"/> /yd ³		0
h.	Total soil unit cost	(d x e) + (f x g)	\$55.00 /yd ³
i.	Hauling, Placement and Spreading unit cost		
	<input type="text" value="\$40.00"/> /yd ³		0
j.	Compaction unit cost		
	<input type="text" value="\$40.00"/> /yd ³		
k.	Total soil unit cost	h + i + j	\$135.00 /yd ³
l.	Soil subtotal	k x b	\$10,164
m.	Percent compaction		
	<input type="text" value="25%"/>		
	Total Slope & Fill Cost	l x (1 + m)	\$12,705

II. Infiltration Layer Soil

Infiltration Soil Cost

a.	Area to be capped		
	<input type="text" value="0.28"/> acres	x 4,840yd ² /ac	1,355 yd ²
b.	Depth of infiltration soil needed		
	<input type="text" value="12"/> inches	x 1yd/36in	0.33 yd
c.	Quantity of infiltration soil needed	a x b	452 yd ³
d.	Percentage of soil from off-site		
	<input type="text" value="100%"/>		
e.	Purchase unit cost for off-site material		
	<input type="text" value="\$55.00"/> /yd ³		
f.	Percentage of soil from on-site	(1 - d)	0%
g.	Excavation unit cost (on-site material)		
	<input type="text" value="\$40.00"/> /yd ³		
h.	Total infiltration soil unit cost	(d x e) + (f x g)	\$55.00 /yd ³
i.	Hauling, Placement and Spreading unit cost		
	<input type="text" value="\$40.00"/> /yd ³		
j.	Compaction unit cost		
	<input type="text" value="\$40.00"/> /yd ³		
k.	Total infiltration soil unit cost	h + i + j	\$135.00 /yd ³
l.	Infiltration soil subtotal	k x b	\$60,984
m.	Percent compaction		
	<input type="text" value="10%"/>		
n.	<i>Subtotal Infiltration Soil Cost</i>	l x (1 + m)	<i>\$67,082</i>

Soil Admixture Cost

o.	Area to be capped		
	<input type="text"/> acres	x 4,840yd ² /ac	0 yd ²
p.	Soil admixture unit cost		
	<input type="text"/> /yd ²		
q.	<i>Subtotal admixture cost</i>	a x b	<i>\$0</i>

Soil Testing

r.	Area to be capped		
	<input type="text"/> acres		
s.	Testing unit cost		
	<input type="text"/> /acre		
t.	<i>Subtotal soil testing cost</i>	a x b	<i>\$0</i>
	Total Infiltration Soil Cost (soil, admixtures, and testing)	n + q + t	\$67,082

III. Erosion Control / Protective Cover Soil

a.	Area to be capped	<input type="text" value="0.28"/> acres	x 4,840yd ² /ac	1,355 yd ²
b.	Depth of soil needed	<input type="text" value="6"/> inches	x 1yd/36in	0.17 yd
c.	Quantity of soil needed		a x b	226 yd ³
d.	Percentage of soil from off-site	<input type="text" value="100%"/>		
e.	Purchase unit cost for off-site material	<input type="text" value="\$70.00"/> /yd ³		
f.	Percentage of soil from on-site		(1 - d)	0%
g.	Excavation unit cost (on-site material)	<input type="text" value="\$40.00"/> /yd ³		
h.	Total erosion/protective soil unit cost		(d x e) + (f x g)	\$70.00 /yd ³
i.	Hauling, Placement and Spreading unit cost	<input type="text" value="\$40.00"/> /yd ³		
j.	Compaction unit cost	<input type="text" value="\$40.00"/> /yd ³		
k.	Total soil unit cost		h + i + j	\$150.00 /yd ³
l.	Erosion/Protective soil subtotal		k x b	\$33,880
m.	Percent compaction	<input type="text" value="10%"/>		
	Total Erosion Control/Protective Cover Soil Cost		l x (1 + m)	\$37,268

IV. Vegetative support soil (Topsoil)

a.	Area to be capped	<input type="text" value="0.28"/> acres	x 4,840yd ² /ac	1,355 yd ²
b.	Depth of topsoil needed	<input type="text" value="6"/> inches	x 1yd/36in	0.17 yd
c.	Quantity of topsoil needed		a x b	226 yd ³
d.	Percentage of topsoil from off-site	<input type="text" value="100%"/>		
e.	Purchase unit cost for off-site material	<input type="text" value="\$70.00"/> /yd ³		
f.	Percentage of topsoil from on-site		(1 - d)	0%
g.	Excavation unit cost (on-site material)	<input type="text" value="\$40.00"/> /yd ³		
h.	Total topsoil unit cost		(d x e) + (f x g)	\$70.00 /yd ³
i.	Hauling, Placement and Spreading unit cost	<input type="text" value="\$40.00"/> /yd ³		
j.	Total soil unit cost		h + i	\$110.00 /yd ³
	Total Topsoil Cost		c x j	\$24,845

V. Vegetative Cover

a.	Area to be vegetated	<input type="text" value="0.28"/> acres		
b.	Vegetative cover (seeding) unit cost	<input type="text" value="\$500"/> /acre		
c.	Erosion control matting unit cost	<input type="text" value="\$500"/> /acre		
	Total Vegetative Cover Cost		a x (b + c)	\$280

Soil Cap Component Subtotal (I + II + III + IV + V): \$142,181

Geosynthetic Barrier & Infiltration Layers

VI. Flexible Membrane Liner

			<u>Calculation or Conversion</u>	
a.	Quantity of FML needed	<input type="text"/> acres	x 43,560ft ² /ac	0 ft ²
b.	Purchase unit cost	<input type="text"/> /ft ²		
c.	Installation unit cost	<input type="text"/> /ft ²		
d.	Total FML unit cost		b + c	\$0.00 /ft ²
	Total FML cost		a x d	\$0

VII. Geosynthetic Clay Liner

a.	Quantity of GCL needed	<input type="text"/> acres	x 43,560ft ² /ac	0 ft ²
b.	Purchase unit cost	<input type="text"/> /ft ²		
c.	Installation unit cost	<input type="text"/> /ft ²		
d.	Total GCL unit cost		b + c	\$0.00 /ft ²
	Total GCL Cost		a x d	\$0

Geosynthetic Layers Subtotal (VI + VII): \$0

Drainage Components

VIII. Sand or Gravel Drainage

		Calculation or Conversion	
a.	Area to be capped <input type="text"/> acres	$\times 4,840\text{yd}^2/\text{ac}$	0 yd ²
b.	Depth of sand or gravel needed <input type="text"/> inches	$\times 1\text{yd}/36\text{in}$	0.00 yd
c.	Quantity of drainage material needed <input type="text"/>	$a \times b$	0 yd ³
d.	Percentage of media from off-site <input type="text"/>		
e.	Purchase unit cost for off-site material <input type="text"/> /yd ³		
f.	Percentage of material from on-site <input type="text"/>	$(1 - d)$	100%
g.	Excavation unit cost (on-site material) <input type="text"/> /yd ³		
h.	Total drainage material unit cost <input type="text"/>	$(d \times e) + (f \times g)$	\$0.00 /yd ³
i.	Hauling, Placement and Spreading unit cost <input type="text"/> /yd ³		
j.	Compaction unit cost <input type="text"/> /yd ³		
k.	Total drainage material unit cost <input type="text"/>	$h + i + j$	\$0.00 /yd ³
l.	Drainage material subtotal <input type="text"/>	$k \times b$	\$0.00
m.	Percent compaction <input type="text"/>		
	Total drainage material cost <input type="text"/>	$l \times (1 + m)$	\$0

IX. Geotextile

a.	Quantity of geotextile needed <input type="text"/> acres	$\times 43,560\text{ft}^2/\text{ac}$	0 ft ²
b.	Purchase unit cost <input type="text"/> /ft ²		
c.	Installation unit cost <input type="text"/> /ft ²		
d.	Total geotextile unit cost <input type="text"/>	$b + c$	\$0.00 /ft ²
	Total Geotextile Cost <input type="text"/>	$a \times d$	\$0

X. Geonet Composite

a.	Quantity of geonet composite needed <input type="text"/> acres	$\times 43,560\text{ft}^2/\text{ac}$	0 ft ²
b.	Purchase unit cost <input type="text"/> /ft ²		
c.	Installation unit cost <input type="text"/> /ft ²		
d.	Total geonet composite unit cost <input type="text"/>	$b + c$	\$0.00 /ft ²
	Total Geonet Composite Cost <input type="text"/>	$a \times d$	\$0

XI. Drainage Tile

a.	Length of drainage tile needed <input type="text"/> LF		
b.	Purchase unit cost <input type="text"/> /LF		
c.	Trenching and backfilling cost <input type="text"/> /LF		
d.	Total drainage tile unit cost <input type="text"/>	$b + c$	\$0.00 /ft ²
	Total Drainage Tile Cost <input type="text"/>	$a \times d$	\$0

XII. Drainage Channels (Stormwater Control)

Drainage benches and berms

a. Size of drainage bench needed	<input type="text"/>	LF		
b. Drainage bench unit cost	<input type="text"/>	/LF		
c. Subtotal drainage bench cost			a x b	\$0
d. Size of drainage swale/berm needed	<input type="text"/>	LF		
e. Drainage swale/berm unit cost	<input type="text"/>	/LF		
f. Subtotal drainage swale/berm cost			d x e	\$0

Rip Rap

g. Quantity of Rip Rap needed	<input type="text"/>	yd ²		
h. Rip rap unit cost	<input type="text"/>	/yd ²		
i. Total rip rap cost			g x h	\$0

Gabian Baskets

j. Quantity of gabian baskets needed	<input type="text"/>	yd ³		
k. Gabian basket unit cost	<input type="text"/>	/yd ³		
l. Subtotal gabian basket cost			j x k	\$0

Total Stormwater Control c + f + i + l **\$0**

Drainage Component Subtotal (VIII + IX + X + XI+ XII): **\$0**

Landfill Gas and Groundwater Features

XIII. Landfill Gas Monitoring & Control Components

Calculation

Landfill Perimeter System

a. Number of probes to be installed	<input type="text"/>	probes		
b. LFG probe unit cost	<input type="text"/>	/probe		
c. Subtotal LFG probe cost			a x b	\$0

Landfill Control Systems

d. Area to be closed	<input type="text"/>	acres		
e. Average number of vents per acre	<input type="text"/>	vents / acre		
f. LFG vent unit cost	<input type="text"/>	/vent		
g. Subtotal LFG vent cost			d x e x f	\$0
h. Length of header pipe needed	<input type="text"/>	LF		
i. Header pipe unit cost	<input type="text"/>	/LF		
j. Header pipe installation cost	<input type="text"/>	/LF		
k. Subtotal LFG active vent hook-up			h x (i + j)	\$0

Total Landfill Gas Management Cost c + g + k **\$0**

XIV. Groundwater Monitoring Components

a. Hydrogeologic study cost	<input type="text"/>			
b. Number of wells to be installed	<input type="text"/>	wells		
c. GW Monitoring Well unit cost	<input type="text"/>	/well		
d. Number of wells > 50 ft length	<input type="text"/>	wells		
e. Additional well length over 50 ft	<input type="text"/>	LF/well		
f. Unit cost for additional well length	<input type="text"/>	/LF		
Total Groundwater Monitoring Well Cost			a + (b x c) + (d x e x f)	\$0

Landfill Gas & Groundwater Features Subtotal (XIII + XIV): **\$0**

Miscellaneous

		Calculation	
XV. Removal and Disposal of Stockpiled Material			
a. Quantity of stockpiled materials	<input type="text"/> yd3		
b. Loading and Hauling unit cost	<input type="text"/> /yd3		
c. Disposal unit cost	<input type="text"/> /yd3		
d. Total Removal/Disposal Cost		$a \times (b + c)$	\$0
XVI. Erosion/Sediment Control			
a. Quantity of silt fence needed	<input type="text"/> LF		
b. Silt Fence unit cost	<input type="text"/> /LF		
Total Silt Fence Cost		$a \times b$	\$0
XVII. Landfill Access Road			
a. Size of LF access road	<input type="text"/> yd2		
b. Depth of gravel needed	<input type="text"/> inches	$\times 1\text{yd}/36\text{in}$	0.0 yd
c. Depth of asphalt needed	<input type="text"/> inches	$\times 1\text{yd}/36\text{in}$	0.0 yd
d. Total material needed		$a \times (b + c)$	0 yd3
e. Road material unit cost	<input type="text"/> /yd3		
f. Placement/Spreading unit cost	<input type="text"/> /yd3		
Total access road cost		$c \times (d + e)$	\$0
XVIII. Site Security			
<i>Fencing</i>			
a. Length of fencing needed	<input type="text"/> ft		
b. Fence unit cost	<input type="text"/> /ft		
c. Subtotal fencing cost		$a \times b$	\$0
<i>Gate or Barrier</i>			
d. Number of gates required	<input type="text"/>		
e. Gate unit cost	<input type="text"/> /gate		
f. Subtotal gate cost		$d \times e$	\$0
<i>Closed Sign</i>			
g. Number of signs required	<input type="text"/> 1		
h. Sign unit cost	<input type="text"/> \$100.00/gate		
i. Subtotal sign cost		$g \times h$	\$100
Total site security cost		$c + f + i$	\$100
XIX. Mobilization / Demobilization			
a. Cost for mobilization/demobilization	<input type="text"/>		
Total mobilization/demobilization cost			\$0

Miscellaneous Subtotal (XV + ... + XIX): \$100

Closure Cost Subtotal (CCS): (I + ... + XIX) \$142,281

Contingency (10%): CCS x 0.10 \$14,228

Engineering & Documentation:

Construction QA/QC (1%) CCS x 0.01 \$1,423

Closure Certification and CQA Report (1%) CCS x 0.01 \$1,423

Survey and as-builts (2%) CCS x 0.02 \$2,846

Cost for survey and deed notation

Total Engineering & Documentation Costs **\$5,691**

Total Closure Cost: CCS + Contingency + Engineering **\$162,200**

Worksheet CEW-02: FORMAT FOR THE ESTIMATION OF POST-CLOSURE COSTS

FILL IN THE BOXES. THE REST WILL BE CALCULATED FOR YOU

I. Groundwater Monitoring

		<u>Calculation or Conversion</u>	
a. Total number of monitoring wells	<input type="text"/> wells		
b. Total number of sampling events/year	<input type="text"/> events/yr	a x b	0 samples/yr
c. Quantity of additional samples (e.g. QA/QC)	<input type="text"/> samples/event	a x c	0 samples/yr
d. Total samples per year		b + c	0 samples/yr
e. Analysis unit cost (Table 3.1 constituents)	<input type="text"/> /sample		
f. <i>Total Analysis cost</i>		d x e	\$0.00 /yr
g. GW Monitoring unit cost	<input type="text"/> /event		
i. <i>Total sampling cost</i>		f + (g x b)	\$0.00 /yr
j. Engineering fees & reports	<input type="text"/> /yr		
Yearly Groundwater Monitoring Cost		i + j	\$0 /yr

II. Landfill Gas Monitoring, Maintenance, and Control

a. Frequency of LFG compliance monitoring	<input type="text"/> events/yr		
b. LFG Monitoring unit cost	<input type="text"/> /event		
c. <i>Total perimeter LFG monitoring cost</i>		a x b	\$0 /yr
d. Frequency of surface monitoring (air permit)	<input type="text"/> events/yr		
e. Surface monitoring unit cost	<input type="text"/> /event		
f. <i>Total surface monitoring cost</i>		d x e	\$0 /yr
g. Control system operating unit cost	<input type="text"/> /yr		
h. Frequency of LFG control system inspections	<input type="text"/> events/yr		
i. Control system inspection cost	<input type="text"/> /event		
j. <i>Total control system cost</i>		g + (h x i)	\$0 /yr
Yearly Landfill Gas Monitoring, Maintenance, & Control Cost		c + f + j	\$0 /yr

III. Leachate Management

a. Quantity of leachate generated gal/yr

On-site Leachate Management or Pre-Treatment

b. On-site treatment operating unit cost /gal

c. *Total on-site management cost* a x b \$0 /yr

Leachate Disposal

d. Private disposal unit cost /gal

e. POTW disposal unit cost /gal

f. Direct discharge to POTW unit cost /gal

g. Pump & Haul unit cost /gal

h. Subtotal leachate disposal unit cost d + e + f + g \$0.00

i. *Total leachate disposal cost* a x h \$0 /yr

j. Leachate sampling & analysis unit cost /sample

k. Frequency of leachate sampling & analysis sample/yr

l. *Total leachate sampling & analysis cost* j x k \$0.00 /yr

Yearly Leachate Management Cost c + i + l **\$0 /yr**

IV. Cap Maintenance & Repair

a. Closed Landfill Area 0.28 acres

Mowing & Fertilization

b. Mowing frequency 6 visits/yr

c. Mowing unit cost \$25.00/acre/visit

d. *Total mowing cost* a x b x c \$42 /yr

e. Fertilizer frequency 3 visits/yr

f. Fertilizer unit cost \$125.00/acre/visit

g. *Total fertilizer cost* a x e x f \$105 /yr

Cap Erosion & Repair

h. Area to reseed/year		33% x a	0.1 acres
i. Reseeding unit cost	<input type="text" value="\$500.00"/> /acre		
j. Total reseeding cost		h x i	\$46.67 /yr
k. Area of cap erosion/year		10% x a	0.0 acres
l. Cap erosion repair unit cost	<input type="text" value="\$4,500.00"/> /acre		
m. Mobilization/Demobilization	<input type="text" value="\$500.00"/> /yr		
n. Total cap erosion repair cost		(k x l) + m	\$626 /yr

Yearly Cap Maintenance & Repair cost

d + g + j + n **\$820 /yr**

V. Sediment Basin Maintenance & Repair

a. Sediment basin cleanout frequency, 1 per	<input type="text" value="3"/> years	1 / a	0.33 event/yr
b. Sediment basin cleanout unit cost	<input type="text" value="\$2,500"/> /event		
c. Mobilization/Demobilization	<input type="text" value="\$500"/> /event		
d. Total sediment basin maintenance cost		a x (b + c)	\$1,000 /yr
e. Total number of stormwater sampling locations	<input type="text" value="4"/> locations		
f. Stormwater sampling frequency	<input type="text" value="4"/> events/yr		
g. Total number of stormwater samples		e x f	16 samples/yr
h. Analysis unit cost (VPDES permit parameters)	<input type="text" value="\$120"/> /sample		
i. Total Analysis cost		g x h	\$1,920 /yr
j. Mobilization unit cost	<input type="text" value="\$0.00"/> /event		
k. Technician field unit cost	<input type="text" value="\$500.00"/> /event		
l. Total sampling cost		f x (j + k)	\$2,000.00 /yr
m. Engineering fees & reports	<input type="text" value="\$500"/> /yr		
n. Total Stormwater Sampling & Analysis cost		i + l + m	\$4,420 /yr

Yearly Sediment Basin Maintenance & Repair

d + n **\$5,420 /yr**

VI. Vector & Rodent Control

a. Vector and rodent control unit cost	<input type="text" value="\$250"/> /yr		
Yearly Vector and Rodent Control Cost		a	\$250 /yr

VII. Post-Closure Care General Inspections

a. General Inspection unit cost	<input type="text" value="\$500"/> /inspection		
b. Number of inspections per year	<input type="text" value="4"/>		
Yearly Post-Closure Care General Inspection Cost		a x b	\$2,000 /yr

Annual Post-Closure Care Cost (APCC)

I + ... + VII **\$8,490 /yr**

Length of post-closure care (LPCC)

years

Post-Closure Care Cost

APCC x LPCC **\$42,448**

Engineering & Documentation

Post-Closure Care Evaluation	<input type="text" value="\$1,500"/>
Post-Closure Care Certification	<input type="text" value="\$1,000"/>
Cost for survey and deed notation (if not completed at time of landfill closure)	<input type="text" value="\$2,500"/>

Engineering Sum **\$5,000**

FA Mechanism Maintenance Cost

/yr

FA maintenance x LPCC **\$0**

Total Post-Closure Care Cost

Post-Closure Cost + Engineering + FA Maintenance **\$47,448**

Section 11. Waiver Requests and Justification

18 AAC 60.900 allows DEC to grant an exemption from any regulation not required by federal law. However, each waiver request increases the permit application fee by the amount listed on Table I-3 of 18 AAC 60.700.

1.	Waiver requests must include [18 AAC 60.210(b)(1)(D)]
	<p>a. Include a list of each regulation for which you are requesting a waiver, and for each requested waiver, a detailed justification that meets the criteria of 18 AAC 60.900 by demonstrating that:</p> <ul style="list-style-type: none">• Compliance with the identified provision would cost significantly more than the value of the environmental benefit, public health risk reduction, and nuisance avoidance that could be achieved through compliance with the identified provision; or• The proposed alternative action will provide equal or better environmental protection, reduction in public health risk, and control of nuisance factors than compliance with the identified provision.

Section 12. Additional Information

Use the space below for additional information as part of the application.

**JUNEAU-DOUGLAS WASTEWATER TREATMENT PLANT PERMIT RENEWAL APPLICATION,
PERMIT NO. SWZA013-12
SECTION 11. WAIVER REQUESTS AND JUSTIFICATION**

11.1. GROUNDWATER

CBJ has studied the impacts to groundwater in the past. As stated in other sections of this permit renewal application package, CBJ Utilities requested and was given permission to discontinue monitoring of groundwater as part of the 1997 or 2012 permit renewals.

The groundwater monitoring requirements were not required as part of the 1997 and 2012 permit renewals. Appendix B Monitoring, Records and Reporting of Permit Number 9011-BA015 states that:

(3) Groundwater monitoring is not required at this facility. Exhibits "H" and "I" of your permit application provide a satisfactory demonstration that the site does not endanger any aquifer of resource value.

CBJ requests that the waiver for groundwater monitoring be extended for this permit renewal.

11.2. EXPLOSIVE GAS MONITORING

Under the waiver provisions, 18 AAC 60.900 (a)(2), CBJ requested and was granted a waiver of the explosive gas monitoring in both the 2007 and 2012 permit renewals. In previous years' permits explosive gas monitoring was not required as follows:

Explosive gas monitoring in buildings within 500 feet of the sewage solids monofill, as required by 18 AAC 60.470(j)(3), is waived under this permit in accordance with 18 AAC 60.900(a)(1). The sewage solids monofill is constructed entirely above the surface grade and explosive gases are able to vent directly into the atmosphere without traveling through the subsurface. As such, the cost of the required gas monitoring would be significantly more than the benefit derived.

CBJ requests that the waiver for explosive gas monitor be extended for this permit renewal.