

**ENVIRONMENTAL CODE
OF PRACTICE FOR
CONCRETE BATCH PLANT
&
ROCK WASHING
OPERATIONS**

PREPARED BY:

DEPARTMENT OF ENVIRONMENT AND LANDS

*INDUSTRIAL ENVIRONMENTAL
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SECTION 1

INTRODUCTION

This Environmental Code of Practice for Concrete Batch Plant (Ready Mix Plant) Operations and Rock Washing Operations was prepared internally by the Industrial Environmental Engineering Division of the Department of Environment and Lands. The code was developed in an effort to provide the members of the Concrete Batch Plant and Rock Washing Industry with a better idea of what the Department of Environment and Lands expects of an operator from both the point of view of the physical plant itself as well as the associated activities in the pit or quarry in which the plant may be located.

By following the provisions described in this code an owner and/or operator will minimize the negative impacts that a concrete batch plant or rock washing operation would have on the environment. This code will also indicate any legal requirements that an operation would be subject to from the point of view of the Department of Environment and Lands only.

Poor operating practice of a concrete batch plant or a rock washing operation can have a drastic impact on the environment. Washing rock creates large volumes of highly silted water and the effluent from cement truck washing can cause immediate destruction of vegetation and fish.

With respect to environmental matters, the operation of concrete batch plants and rock washing operations in Newfoundland and Labrador is regulated under The Department of Environment and Lands Act and the following associated regulations:

1. The Storage and Handling of Gasoline and Associated Products Regulations and Amendments
2. The Air Pollution Control Regulations
3. The Environmental Control (Water and Sewage) Regulations
4. The Waste Material (Disposal) Act and Amendments

Copies of the above acts and regulations may be obtained from the Queen's Printer, Confederation Building, St. John's.

This code will first discuss areas of concern that are common to both concrete batch plant and rock washing operations and will then present a section with concerns particular to concrete batch plants followed by a section presenting concerns particular to rock washing operations.

SECTION 2

ENVIRONMENTAL CONCERNS AND REQUIRED PRACTICE FOR BOTH CONCRETE BATCH PLANTS (READY MIX PLANTS) AND ROCK WASHING OPERATIONS

2.0 LOCATION:

One of the most important factors in meeting the requirements of the Department is the selection of a site. Effects of both noise and dust on nearby populated areas are of primary concern, followed by potential impacts on vegetation, wildlife and water quality. When considering the appropriateness of a prospective site for the operation of a concrete batch plant and/or rock washing process, the following items shall be taken into account:

- the operation shall be at least 1 km from any residential areas, recreational facilities, or commercial establishments, such as hotels or restaurants.
- access to the site is not to be through residential areas
- outer boundaries of the site, including quarry operations, are to be at least 300 meters from any body of water, such as streams or ponds. A distance of 300 meters should also be maintained from all provincial highways. Site drainage shall, as much as possible, be away from water bodies. An operation is prohibited from locating within a protected watershed or other designated sensitive area.
- the operation is to be neither clearly visible from a provincial or municipal highway or street nor at an elevation that makes the operation visible to the surrounding area. A vegetation screen is to be maintained where possible.

2.1 DUST AND NOISE GENERATION:

Dust and noise is generated by various aspects of an operation. Dust and noise can be generated by the movement of mobile equipment on site, a crushing operation, quarrying and the transferring of cement to a storage silo. The impacts of dust and noise can be reduced by appropriate site selection. Selecting a site that is removed from other human activities allows dust in the air to settle out or disperse so that upon reaching human activity its impact is minimal. Similarly as distance increases noise level decreases, creating another reason to locate the plant away from other activities. Vegetation screens should assist with noise reduction. Other measures that can be implemented to reduce dust generation are:

- enclosing the conveyor belts
- the use of dust suppressants (such as water but not hydrocarbons) on site roadways and conveyor belt drop offs. (The use of dust suppressants other than water require the Approval of this Department. Where water is used, it is not to be used to excess)
- capturing of particulate before air is exhausted during cement unloading.
- using a water spray to reduce dust associated with the crusher

The reduction of noise is more difficult. However, it is possible to install equipment and/or institute procedures that will reduce noise.

The Department will take action to prohibit any operation that is creating significant levels of dust or noise.

2.2 WATER SUPPLY:

An initial supply of water will be required for cement truck washing and rock washing. This is usually obtained via a nearby stream or pond. However, before water can be drawn from a water body, unless the water is from a water supply already approved by this Department, a Certificate of Approval must be obtained from the Water Resources Division of this Department. Existing approved water supplies are municipal or industry owned and permission must be obtained to access these supplies.

It is important to note that altering or disturbing a water body is strictly forbidden. When accessing a water body for a water supply it must be done in such a way that impact on it is kept to a minimum.

2.3 FUEL STORAGE AND USE:

The on site storage of fuel for the heavy equipment, trucks, and generators is governed, or regulated, by The Storage and Handling of Gasoline and Associated Products (GAP) Regulations and Amendments. A separate Certificate of Approval from this Department is required for fuel storage.

It should be noted that underground fuel storage tanks are acceptable to the Department provided they meet the requirements of the GAP Regulations. It should also be noted that, as per the GAP Regulations, "aboveground tank" means any tank which is located at or above grade, including both horizontal and vertical tanks, and tank truck and tank truck trailers that are being used as a stationary source of fuel storage. Aboveground tanks must be dyked as per GAP Regulations.

With respect to tank location it is obvious that certain tanks will have to be located adjacent to the equipment that is being supplied. Tanks used to store fuel for mobile equipment however,

should be located away from high traffic areas to reduce the carryover of spilled fuel. All fuel storage tanks should be located as far as away as possible from nearby streams, ponds, rivers or other bodies of water to which spilled or leaking fuel might flow.

Other than the concern over proper dyking of aboveground tanks or the proper installation of underground tanks, there is one other concern of equal importance to be considered. This is the contamination of soil resulting from the spillage of product during the fuelling of vehicles and other equipment. Proper care and caution will decrease the likelihood of this contamination. When spills do occur they should immediately be contained and absorbent material applied as quickly a possible. Once a spill has been contained and controlled, all oil contaminated soil and absorbent must be collected and be disposed of at any nearby authorized waste disposal site.

If a spill of 70 litres or more occurs it must be reported by telephoning (709) 772-2083.

The Department requires that the operator of a concrete batch plant or rock washing facility keep an amount of oil absorbent material on site. The minimum volume of absorbent expected to be maintained at the site is 0.5 m³

2.4 CHEMICAL STORAGE:

Any chemicals that are kept on site must be stored in accordance with the National Fire Code and Occupational Health and Safety Regulations. This Department will require that any chemical kept on site must be stored in a secure area and that facilities must be provided to prevent long term exposure of containers to outside weather conditions. Liquid chemicals will require placement inside a dyked area. The Department also requires that before initial start up, copies of Material Safety Data Sheets (MSDS) of any chemical that will be used are provided to the Department. If any change in the chemicals to be used occurs, the Department is to be notified and the appropriate MSDS sheets provided.

If a chemical spill does occur the Department is to be notified immediately. Clean up procedures are to be as per recommended guidelines for the particular chemical spilled, unless otherwise directed by the Department.

2.5 DISPOSAL OF WASTE:

Any waste other than hardened concrete and settled fines is to be disposed in an approved waste disposal site. This includes any lunch wastes, maintenance wastes, empty containers, and oil contaminated soil that may occur on site. If these wastes are not regularly collected and disposed of properly, an operator may be charged under the Waste Material (Disposal) Act.

Waste fines from rock washing and hardened concrete may be disposed of on site provided the following guidelines are followed.

- 1) Settling pond fines are placed in a recessed area or shallow hole and covered with courser material to prevent dust due to wind erosion.
- 2) Hardened waste concrete may be used as a fill material off site.

2.6 EVENTUAL SITE CLOSURE:

Once an operator wishes to leave or close out an operating site, the Department will expect that site to be rehabilitated to a condition as good or better than which it was found. Some items in particular that will be checked on are:

- 1) Removal of all structures and equipment from the site.
- 2) Settling ponds are to be filled to grade.
- 3) All waste is to be disposed of at an authorized waste disposal site.
- 4) Fuel storage tanks are to be removed from the site.
- 5) All slopes are to be graded to 20° or less.
- 6) Organic soil is to be spread over the area.
- 7) The site is to be vegetated.

2.7 EFFLUENT DISCHARGE:

A properly designed and constructed concrete batch plant and/or rock washing operation should have no discharge of a liquid effluent. However, if for whatever reason circumstances do arise that necessitate the discharging of effluent the following criteria and procedures are to be met.

The criteria in the Environmental Control (Water and Sewer) Regulations have to be met before discharging any effluent. The most significant of these criteria for a concrete batch plant and/or rock washing operation are the requirements for total suspended solids and pH which are:

Total Suspended Solids # 30.0 milligrams per litre (mg/l)

5.5 # pH # 9.0

If the effluent to be discharged meets all levels described in the Water and Sewer Regulations, it may be discharged into a body of water such as a stream or pond provided the water body is not part of a protected watershed. The effluent may be pumped onto the ground or other surface leading to a water body but it must meet the criteria of the Water and Sewer Regulations and it must not cause erosion of that surface or pick up solids from that surface that may cause it to have a total suspended solids content greater than 30 mg/l.

It is preferable that an effluent meeting the required criteria be discharged into a recessed area of the operation's site and be allowed to evaporate or seep into the ground. If this method is used, it must be done in a controlled fashion in order to prevent overflow and/or erosion. It is not permissible to allow discharging effluent of any sort to freely run over the ground or overflow containment ponds. Discharging of effluent onto vegetated or other inappropriate areas will be viewed as intentional flooding and subject to action by this Department.

SECTION 3

ENVIRONMENTAL CONCERNS AND REQUIRED PRACTICE PARTICULAR TO CONCRETE BATCH PLANTS (READY MIX PLANTS)

A concrete batch plant which is operated prudently with regard to the environment can have little negative impact on the environment. However, careless attention to the detail of simple activities such as the washing out of cement trucks will damage our environment and subject the operation to legal prosecution.

Once an operation has established all equipment and devices necessary to minimize impact on the environment, all that remains is for the people that carry out the day to day activities to do them in such a way that the site is kept clean and tidy and the equipment and facilities provided are maintained and used properly.

3.0 WASHING OF CEMENT TRUCKS:

The effluent created through the washing out of cement trucks is typically high in pH and highly silted or has a high suspended solids content. This effluent, if allowed to discharge freely onto the soil will immediately kill vegetation and contaminate ground water. If it is allowed to find its way into water bodies such as ponds and streams, life in the water including fish will perish. To prevent such occurrences, the Department requires that any cement truck washing will be done as described below:

- 1) Other than the rinsing of the chute, before any washing is carried out, the cement truck must return to the site of the concrete batch plant. Any truck that is discovered

washing into a storm sewer, ditch, brook or pond is subject to prosecution under the Environmental Control (Water & Sewer) Regulations.

- 2) The rinsing of the chute may be carried out at the delivery site but care and caution must be taken before any concrete is rinsed from a chute at the delivery site. It is permissible to rinse onto the ground or soil but under no circumstances into a pond or stream or onto a surface that leads directly to a water body, such as a storm sewer.
- 3) The concrete batch plant operator must construct a containment pond into which all truck washing is to be done. This pond would be about 40 feet by 15 ft and no more than 3 ft deep. The material used to form the bottom and sides of the pond may be either, a clay like soil that is compacted prior to any washing of trucks into the pond or a man made material that would line and seal the pond. Department approval must be obtained before installing a man made or synthetic liner. The pond should be constructed on higher ground and not be allowed to have water exit freely or have any sort of stream or brook running into or out of the pond, that is to say that the pond is to be self contained with no inlets or outlets and with no possibility of surface drainage going into it.
- 4) Any trucks returning with unused concrete must dispose of this concrete into an area able to contain it while still in liquid form before the trucks can be washed. Once the concrete has hardened it may be used as fill material. Liquid concrete is not permitted to run freely over the ground.
- 5) Once all concrete has been removed from the truck, the truck may be brought over to the containment pond where washing can take place. Any water that is used to wash the truck must be directed into the pond. Operators are encouraged to reuse the water from the pond to wash cement trucks.

- 6) If for any reason the water level in the pond reaches a height that necessitates discharge, the effluent must meet the criteria described in section 2.7 before it would be permitted to be discharged directly or indirectly into a storm sewer, body of water or onto the ground.

SECTION 4

ENVIRONMENTAL CONCERNS AND REQUIRED PRACTICE PARTICULAR TO ROCK WASHING OPERATIONS

Similar to a concrete batch plant, a rock washing operation which is operated prudently can have little negative impact on the environment. However, an irresponsible or careless operator will cause pollution to be released into the environment and attract the attention of legal authorities.

It is important to have the necessary equipment and facilities provided but it is equally important that the people operating and maintaining the operation realize the significance that their day to day activities have on the environment.

4.0 WASHING OF AGGREGATE AND ASSOCIATED SETTLING PONDS

The primary environmental concerns of a rock washing operation include the possibility of highly silted water (water high in suspended solids) being discharged into the environment and the unnecessary pollution of water by only using water, to wash rock, a single time. To address these concerns all rock washing operations are required to use a closed settling pond system.

Any water used to wash rock must not be allowed to flow freely into the environment. A system of settling ponds is required to contain and treat the silted water. An acceptable settling pond system (see figures 1 & 2) consists of at least two adjacent settling ponds. The size of the settling will depend on the flow rate and the settling rate of the solids washed off the rock. Settling ponds must also be constructed with enough capacity to prevent overflow into the surrounding countryside and provide sufficient settling to provide water clean enough for recirculation.

A properly engineered settling system would include at least two settling ponds set up in such a way that the discharge from the rock washing enters the first or primary settling pond where initial

settling occurs. Overflow from the primary settling pond is directed into the second or secondary settling pond where final settling may occur. At the end farthest away from the end where water enters the secondary pond, a pump intake is installed which takes water back to wash new rock. The size of ponds needed to provide water sufficient for recirculation can be determined once data is obtained indicating the degree of silt in the water that can be tolerated in order to reuse it to wash new rock, the required flow rate of water over the rock being washed and the settling rate of the silt being washed off the rock. Settling time may be increased by the addition of extra settling ponds. To increase the rate of settling of the silt a flocculant may be used. However, caution must be taken whenever the use of chemical additives is considered. Specific approval from this Department is required before a flocculant can be used to aid in settling.

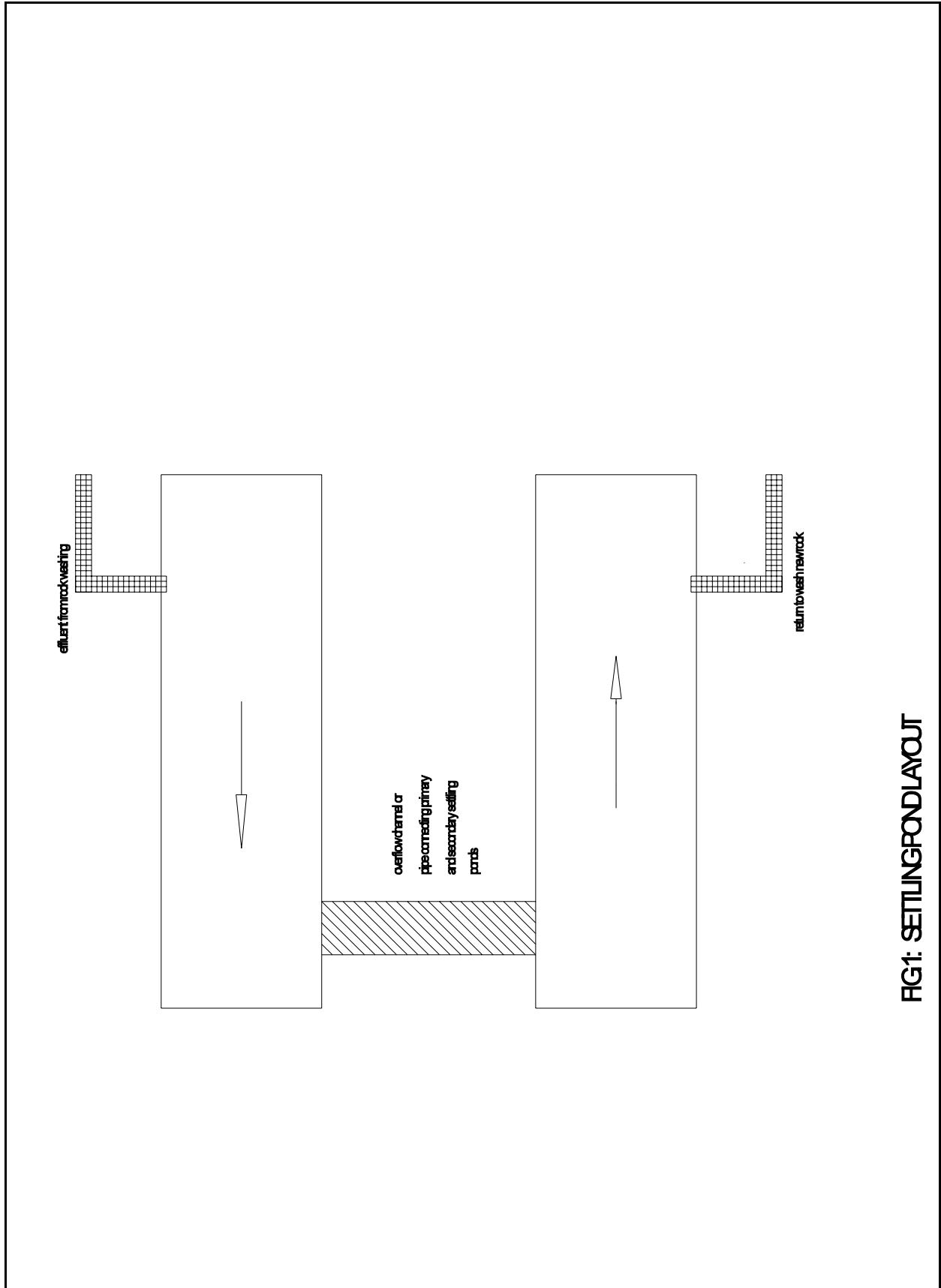
Settling ponds are also required to be constructed in such a way that water will not be allowed to quickly seep out into the ground. The ponds must be sufficiently tight to contain water long enough for solids to settle out and water to be reused. To provide for this a clay like soil may need to be spread and compacted in each pond. Once the ponds are put into use, the settling silt will serve to seal the ponds. Man made or synthetic liners may also be used to line the ponds but the liner must be approved by the Department.

The settling ponds must also be placed and/or constructed in such a way that any surface drainage does not find its way into the settling ponds. This may require placing the ponds at the highest elevation on site and/or constructing a berm or bank around the ponds to prevent natural drainage from entering the ponds.

Water in the settling ponds must not be allowed to overflow or discharge freely into the environment. To prevent overflows and to maintain operating efficiency, the settling ponds will periodically need to have the fines or settled silt removed. Depending upon the rate of usage and size, this could be as often as daily. If at any time the water level in the ponds is such that water will have to be discharged, the requirements of the Environmental Control (Water and Sewer)

Regulations would have to met. Section 2.7 describes the requirements and procedures for discharging any effluent.

Before starting to wash rock, the settling ponds may need to have water supplied from a pond or stream until there is enough waste to start washing with recirculated water. All rock washing must be done using a recirculating closed system. The Department will not tolerate the washing of rock with water from a stream or pond which is only used once and allowed to flow into the environment or to a single or multiple holding ponds without being recirculated. Once enough water has been provided to start recirculation the only fresh water that may be added is to make up for that lost through evaporation and/or seepage.



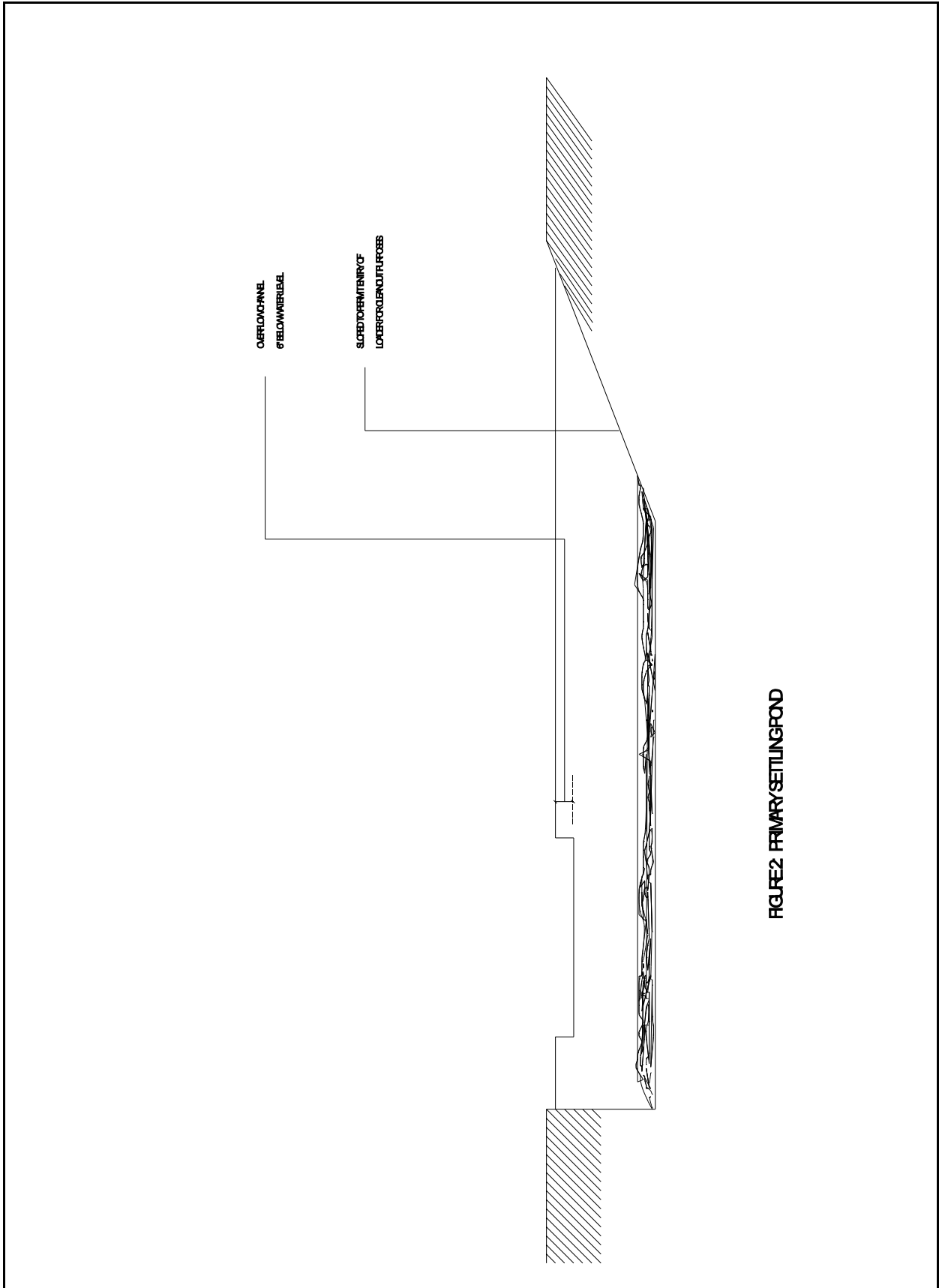


FIGURE 2 PRIMARY SETTLING POND