

14.0 MATERIAL ASSETS – SITE SERVICES

14.1 SURFACE WATER DRAINAGE

14.1.1 Surface Water Resources

The main surface water resources in the vicinity of the application site are the Kinnegad and Castlejordan Rivers. The Lagan Cement site lies entirely within the catchment of the Kinnegad River, which forms the northern boundary of part of the site, just north of the shale quarry. The source of the Kinnegad River is located west of the site and the surface water divide between the catchments of the Kinnegad and Castlejordan Rivers lies to the south of the site.

14.1.2 Surface Water Collection and Handling

There are three main sumps used for water management at the site:

- 1) The terrace sump (manages surface water run-off in the plant area);
- 2) The shale quarry sump; and
- 3) The limestone quarry sump (manage groundwater pumped from the two quarries).

The terrace sump is located at the northern end of the raw materials reception and handling compound and has a maximum discharge rate of 200m³/hr which is controlled by means of a float switch. The 35 x 40 x 3m sump is formed at a low level to avoid two-stage pumping and water from here is pumped via two 160mm pipes to an inlet chamber from where it is gravity fed into the balancing pond. Water is pumped on an as-required basis using a level controlled submersible pump capable of handling inflows in excess of 700l/sec. The sole function of the terrace sump is to pump stormwater from the surface water drains in the main plant yard area and therefore this sump only functions during rainfall. Waters from the balancing pond are gravity fed into the pre-settlement lagoon from where they are fed onto the main settlement lagoon again under gravity.

The limestone quarry sump has a maximum discharge rate of 138m³/hr, which is controlled by means of a float switch. Water is pumped from the limestone quarry sump on an intermittent basis as required. The limestone quarry sump discharge is pumped to the inlet chamber from where it is gravity fed to the balancing pond. From here it is directed to the pre-settlement lagoon and then onto the settlement lagoon.

The shale quarry sump has a maximum discharge rate of 45m³/hr and is controlled by means of a float switch. Water is pumped from the shale quarry into a purpose built drain and then flows by gravity into the pre-settlement lagoon and on into the settlement lagoon. Water may be directed to the balancing pond from the shale quarry sump if flow rates from the balancing pond to the settlement lagoons would exceed those which can permit settlement of suspended solids in the settlement lagoons.

14.1.3 Surface Water Treatment

The balancing pond and the settlement lagoons are the main features of the surface water management system at the site.

Balancing Pond

The balancing pond receives all water pumped from the terrace sump and the limestone quarry sump and can receive water from the shale quarry sump if and when required. The balancing pond measures 170 x 110 x 4m deep and is designed to accept excess run-off from storm conditions up to a 1 in 20 year return storm. The volume of the balancing pond is approximately 35,000m³ and the top water level is 85.5m AOD and the invert of the discharge pipe is at 82.25m AOD. To be able to function at times of high rainfall, it is necessary for the pond water level generally to be low.

The discharge from the balancing pond is regulated by a 52mm diameter throttle plate attached to the outflow pipe. Oil traps are installed to intercept any potential on-site spillage of hydrocarbons. The water from the balancing pond flows under gravity to the pre-settlement lagoon in a 225mm drainpipe. Water from the balancing pond flows at a rate not exceeding 109m³/hr (for the 20 year storm) and at a mean discharge rate of 75m³/hr (for the same storm). This ensures that excess water during storms can be regulated in discharge to the settlement lagoons whilst these lagoons are still receiving some pumped ground water.

Settlement Lagoons

The settlement lagoons are located just north of the shale quarry and discharge into the Kinnegad River. The volume of the pre-settlement lagoon and the settlement lagoon is 35,000m³ and 70,000m³ respectively. The settlement lagoons receive water pumped directly from the sumps of the two quarries and from the balancing pond. The maximum permitted discharge rate from the settlement lagoons to the Kinnegad River is 260m³/hr or 6150m³/d (71 l/s). The design residence time in the settlement lagoons is 28 hours. The final discharge to SW1 is via a pipe from the overflow weir. An oil interceptor is installed to remove oils and hydrocarbons from all inflow.

The minimum daily discharge to the Kinnegad River will be solely that from groundwater pumping during periods of drought viz 3,520m³/d (after 38 years). The routings of surface water run-off either via the works sumps, balancing pond and settlement lagoons or via the quarry sumps and the settlement lagoons are such that it is most unlikely that significant increases in discharge will arrive at SW1 until 48 hours after a heavy end-of-drought rainfall. After prolonged drought it is likely that the quarry sumps receiving surface water run-off would be low having been used to provide water for dust suppression. Hence, increased discharges into the Kinnegad River, following heavy rainfall, should correspond to a parallel increase in river flow.

The maximum controlled rate of discharge of both surface water and pumped groundwater is 6150m³/d. The mean surface water and pumped groundwater flow will be 5,040m³/d (after 38 years). Mean discharges will normally occur during normal periods of rainfall and not during droughts.

Flow from the settlement lagoons to the Kinnegad River are continuously monitored and when this exceeds 256m³/hr water from one or both of the quarries, is switched automatically to feed into the balancing pond. For storms beyond the 20 year return period water would be allowed to rise in one or both of the quarries. Therefore, the outlet from the settlement lagoon acts as a hydrobrake, designed to flood at the balancing pond and the settlement lagoons in the event that storm flow and pump rates from the quarries exceed the discharge limit. It is not envisaged that the proposed quarry extension will require a change to the surface water management system (i.e.) for storms above the 1 in 20-year threshold, water will be allowed to rise in one or both quarries.

14.2 WATER SUPPLY

It is not envisaged that the proposed extension to the quarry will involve any further works to the water supply infrastructure at Lagan Cement Ltd.

14.3 FOUL DRAINAGE

It is not envisaged that the proposed extension to the quarry will involve any further works to the existing foul sewer infrastructure at Lagan Cement Ltd.

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