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11 October 2019

Hawke's Bay Regional Council
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Attention: Tania Diack

Dear Tania

RESPONSES TO SECOND FURTHER INFORMATION REQUEST FOR CONSENT APPLICATION APP-123774

Thank you for your letter dated 12 July 2019 requesting further information relating to stormwater management at the Wairoa wastewater treatment plant (WWTP) and design details of the proposed replacement outfall structure in the Wairoa River for discharging treated wastewater from the WWTP. This letter provides WDC's responses to the further information sought and includes a copy of the outfall design drawings that were provided to you by email last Thursday.

STORMWATER MANAGEMENT

Stormwater System Catchments
There appears to have been some misunderstanding of the WWTP's stormwater management system design between yourself and Grey Wilson of Good Earth Matters Consultants.

It is correct to note that the WWTP site's stormwater does not discharge into Wairoa's municipal stormwater network. This is because the municipal stormwater network does not extend south of Grant Street except for a few culvert crossings beneath Kopu Road and drains along Williams and Fitzroy Streets. Each of these stormwater drains discharges directly into the Wairoa River or its riverbank reserve. None of them collect or convey stormwater from the WWTP site.

Stormwater from the WWTP site discharges down the natural gullies that are located to the north and south of Rangihoua (Pilot Hill) upon which the WWTP is located, and then flows into rural drains that cross the low-lying flats to the Wairoa River. Nigel How noted that the rural drain on the northern side of the WWTP is the modified channel of the original (pre-European) Tawhara Stream which has its headwaters on the western side of the ridge above the WWTP. It now only drains some southern parts of Wairoa and the eastern flanks of the hills between the WWTP and Wairoa.

WWTP Stormwater System Description
The WWTP site has dedicated stormwater drainage ditches around the outside edges of the WWTP pond bunds. These ditches are grassed and mown to keep the grass short and tidy. By virtue of the raised WWTP pond bunds, the WWTP's stormwater ditches are in fact incapable of overflowing into the WWTP ponds or the WWTP's treated wastewater outlet pipeline. Consequently, there is no need to design any changes to the WWTP's stormwater system to reduce its contribution to I&I inflows into the WWTP ponds, nor is there any need to separate it from the wastewater reticulation in a similar manner to the programme that has been implemented for the urban reticulation.

However, in very large storm events there have been rare occasions when the WWTP ponds have overflowed their bunds and/or the underground wastewater bypass pipes around the WWTP ponds have overflowed via their manhole covers into these stormwater ditches. WDC's current and future I&I reduction programme within Wairoa is addressing this risk by removing all residential stormwater connections into the wastewater reticulation, thus ensuring that the storm flows of wastewater to the WWTP are significantly reduced from historic volumes, which is consequently ensuring that all storm events (even extreme events) are unlikely to generate enough wastewater inflows to overtop the WWTP pond bunds. The proposed wastewater discharge regime of continuous, unlimited discharges when the river is in flood conditions (above 3 x median flow) will enable the discharge rate of treated wastewater to more likely keep pace with storm inflows, thus further ensuring that the wastewater in the WWTP ponds will never overflow into the WWTP's stormwater drains.

It could be argued that there is some risk of wastewater and a variety of other contaminants (such as cleaning products and grease) becoming entrained from the WWTP's facilities such as the inlet screen area, control building area, and vehicle access routes around the treatment ponds. WDC's good site management practices ensure that contaminants do not accumulate or remain on the ground long enough to present opportunities for contamination of stormwater. Any microbial or chemical residues that are entrained by stormwater flows across the WWTP site will either be retained by the grassy swales of the WWTP's stormwater drains or will be rapidly diluted as these drains continuously collect more stormwater along their lengths.

WWTP Stormwater Catchment Size and Discharge Parameters

The area of the WWTP's land parcel is 5.48 hectares, but this includes about 1 hectare of land south and east of Pilot Hill that does not slope past the WWTP facilities and therefore has no risk of being contaminated by wastewater or other contaminants from the WWTP site.

The WWTP ponds occupy about 1.5 ha, and any rainfall that directly falls into these ponds or their bund slopes will simply dilute the wastewater already residing in the ponds that ultimately discharges to the Wairoa River via the main outfall structure. These rainfall volumes are already included in the WWTP's discharge volumes that are reported in WDC's compliance records and were summarised in the wastewater discharge consent application AEE and supporting documents.

The majority of the WWTP site that generates stormwater runoff is grassed and regularly mown. The grassed areas have some capacity to absorb rainfall into the soils, at least during summer months. A fairly small portion of the WWTP site has impervious surfaces that are comprised of the access road, control building, carpark area, and inlet screen accessway. However, these divert their run-off into the grassed stormwater drains around the WWTP ponds.

The stormwater volume and rate for the WWTP site has not yet been assessed because this requires the land areas and run-off coefficients to first be determined for each sub-catchment of the WWTP site. This information is also a fundamental part of the stormwater consent application. The volume and rate of stormwater are not relevant to the wastewater discharge consent applications because the WWTP site's stormwater does not enter the WWTP ponds and nor does it ultimately discharge via the outlet pipeline to the Wairoa River.

Relevant Regional Plan Rule and Proposed Consenting Approach

In WDC's view, RRMP Rule 43 classifying the WWTP's stormwater discharges as a Controlled activity would apply because:

- The WWTP's discharges of stormwater enter neighbouring properties that are inland of the Coastal Environment mapped by the Regional Coastal Environment Plan (RCEP); and
- The WWTP falls within the RMA definition of industrial and trade premises, so cannot be a Permitted activity under Rule 42; and
- The WWTP's stormwater discharges are unlikely to give rise to the RMA s107 adverse effects on the receiving environment after reasonable mixing; and
- The WWTP's stormwater management system includes, in WDC's opinion, all reasonable measures to ensure that the discharge is unlikely to cause the RMA s107 effects noted above.

WDC intend to seek a stormwater discharge consent for the WWTP site that is separate from the APP-123774 suite of wastewater discharge consents. This is primarily because of the full separation of the two discharge systems at the WWTP site. The completely different water quality and flow characteristics of the WWTP's treated wastewater and stormwater discharges is also a strong reason for separating the discharge consents.

As you are aware, WDC and Good Earth Matters are preparing a global discharge consent application for Wairoa's entire municipal stormwater system. This global consent application will not include any stormwater discharges from the WWTP because the WWTP falls outside the geographical coverage of Wairoa's municipal stormwater system. In addition, WDC believe the stormwater consents should be separated because the WWTP site poses different contamination risks from those of the urban Wairoa catchment.

A considerable amount of work is required to produce appropriate levels of documentation for seeking a WWTP stormwater discharge consent, so WDC are unable to lodge an application in the next month or two and have it incorporated into the processing of the wastewater discharge consent applications. WDC will endeavour to progress the investigations and documentation for this stormwater consent application in a timely fashion.

It is important to note that the WWTP's stormwater system was an integral feature of the original WWTP when it was constructed in 1980-81 and, despite being lawfully established, it does not appear to have ever had a stormwater discharge consent to authorise its discharges since the RRMP rules regulating stormwater discharges became operative. The same situation applies to Wairoa's urban stormwater system which is much older (presumably up to 180 years old). The consenting status of Wairoa's stormwater discharges is also not unusual for the Hawkes Bay region or indeed the rest of New Zealand.

REPLACEMENT OF OUTFALL STRUCTURE

A series of questions relating to the proposed new outfall structure was presented in a memo dated 4 July 2019 from E2 Environmental consulting engineers to HBRC which was attached to and directly referred to in your s92 letter dated 12 July 2019. Each of the issues raised by E2 Environmental are addressed below in the order they were raised.

Scouring of Riverbed

The proposed design by Offshore and Coastal Engineering Ltd (OCEL) locates the centreline of the duckbill diffusers 1.0 m above the riverbed. The diffusers are also angled to point towards the river mouth instead of at right angles to the river flow. Both of these design features will ensure that any scour of the riverbed from the jet flow of wastewater is avoided. OCEL do not expect any significant riverbed scour effect apart from perhaps a localised depression, so the riverbed will not be protected against potential scour from the wastewater jet flow.

In addition, the proposed discharge regime will use slower flow rates during low river flows (less than median river flows) and discharge flow rates will increase as river flows increase. These discharge flow controls will ensure that the riverbed is protected from scouring because the river flow will not be unduly disrupted by the wastewater discharge.

OCEL acknowledge that there will be significant scour from river flows during flood events, but the new outfall structure has been designed specifically to be streamlined so as to minimise scouring around its sides, and the piles are designed to take the full flow force plus debris. The diffuser's outer structure is also buried at least 2.4 m into the riverbed, which is expected to be well below any potential scouring zone, so it is very unlikely to ever be undermined It is important to note that the treated wastewater discharge flow rate will be so insignificant compared with the flood flows that the discharge itself will not generate any scour risks for the riverbed during flood events.

Pipeline Buoyancy and Stability
A reduction in riverbed cover of the pipeline due to riverbed migration will not cause any buoyancy or stability issues for the pipeline because the pipe filled with wastewater combined with ballast weights and piles located at 5m centres will prevent movement and floatation. Even if the pipe is fully exposed by scouring of the top cover it will be held against hydrodynamic drag forces by the pin piles installed through the pile guide incorporated into each concrete ballast weight.

Vacuum Seal Testing
OCEL do not understand why there should be any need for a vacuum seal. The duckbills can only be opened by a pressurised flow of water exiting the pipeline, not from external pressures resulting from river flows, and each of the flange connections will seal against internal and external pressures.

Pipeline Abandonment vs Relocation
Figure 5.1 of the AEE provided a broad area (yellow outline) within which the outfall pipeline could be relocated; this area was deliberately made large enough to cover all possible river channel migrations and to provide freedom for designing the pipeline configurations. In the event that the new outfall requires relocation in future, there are various options available for achieving this. The pipeline could be shortened or extended without changing its alignment, a bend could be inserted at an appropriate point to create a dog-leg for the final section (similar to that of the current outfall pipeline), or the full length of straight pipeline could be rotated to a different angle from its currently proposed alignment.

WDC anticipate that any changes that make pipeline sections redundant will include the dismantling and removal of the redundant pipe and piles from the riverbed **unless** the removal is impracticable and/or too hazardous for safety of construction personnel and equipment. As far as practicable all future pipeline modifications will re-use materials from the new pipeline unless the materials are no longer fit for this purpose. In the event that infrastructure is abandoned in situ, WDC are of the view that there would be no adverse effects on the river environment because the materials are suitably benign in nature and would be buried well below the riverbed's natural silt accumulations.

Trenching Details
The enclosed design drawings provide the requested trenching details.

Thrust Stabilisation
The bend below the diffuser outlet will be buried at least 2 m below the riverbed and the diffuser end structure will be filled up to 2.4 m deep with local sediment. That sediment can be contained in geotextile bags locking the pipe into the structure. The thrust load will be taken by the side of the diffuser structure and transferred to the lateral piles.

Maximum Flow Rate Capacity
The maximum flow rate capacity of the two-duckbill discharge system is 273 L/s which matches the existing consented limit of 5,400 m^3/d over a 5.5-hour period for the treated wastewater discharge. The actual discharge rate is expected to generally be well below this due to the proposed restrictions on flows and timing that are given in the AEE.

Design Details
The enclosed design drawings provide the requested details for the entire pipeline. The steel piles for the diffuser armour will be 10 m long and will be driven about 8.25 m into the riverbed.

I trust that the attached drawings and the above responses provide the clarification that you sought on 12 July 2019. Please contact Hamish Lowe at Lowe Environmental Impact (phone 06 359 3099 or email hamish@lei.co.nz) if you require any further information.

Yours sincerely

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Encl

Design drawings for proposed outfall replacement (Offshore and Coastal Engineering Ltd, 12-30 September 2019)