Attachment A: S92 Summary Response

(i) *The Executive Summary and Figure 4 of the AEE identify 30+ scour valves for "maintenance access to the network" but there is no commentary on how often – if at all – discharges occur via these scour valves. In addition, there is inconsistent use of terms throughout the AEE and technical reports that is confusing. The wet weather overflows denoted as P1, P2 and P3 in Figure 4 are also referred to as "scour valves discharges" and the title of several technical reports refers to "scour events". "Scour" is not defined in the glossary. Please clarify the types of dry weather wastewater discharges for which you are seeking consent and the terminology that should apply to each of these, as well as the wet weather overflows.*

We acknowledge that the term 'scour valve' has been used inconsistently within the application and associated technical reports and apologise for this inconsistency. The term 'scour valve' is a general catch-all term that was applied to most valves within the network and does not correctly describe the purpose or operation of the various valves on the wastewater network.

The scour valves shown in Figure 4 of the application/assessment of environmental effects (AEE) are access points to the network for maintenance and repair - they are not formal overflow points. While the sampling protocol (Appendix G), hydrodynamic modelling (Appendix J) and water discharge volume (Appendix K) reports appended to the AEE refer to overflows from the scour valves – these are not those scour valves indicated in Figure 4. These reports should more correctly refer to wet weather overflow discharges, with Appendices K and J modelling overflow discharges via the primary and secondary overflow points during specified (50% and 10 % AEP) rainfall events.

However, as outlined in Section 1.5 of the AEE, consent is sought for all overflows – including from both formal and informal/uncontrolled overflow points (typically wet weather overflows) and as a result of network blockage/problems (dry weather overflows). Wet weather overflows are managed through a tiered approach through primary, secondary and tertiary overflow points, with the latter only being used as necessary in very large rainfall events. Consent has also been sought for wet weather overflows from informal overflow points to cover the possibility of overflows from informal points as a result of blockages or during severe rainfall and flood events – where the operation of the primary, secondary and tertiary overflow points is not sufficient – as it is not practically possible to prevent informal overflows in all circumstances.

(ii) *The application appears to be based on the premise that an 85% reduction in direct stormwater inflows to the wastewater network will be achieved through the Council's DrainWise programme. It is critical to understand the data/information and process (including any associated assumptions) used to arrive at the predicted 85% reduction because this reduction has been applied in the MetOcean dilution and dispersion modelling, the results of which inform a series of other technical reports on the anticipated effects of the overflows on ecological and human health.*

How confident is the applicant that the 85% reduction target will be achieved, despite the fact that the AEE indicates around 50% of the network occurs on private properties and a number of network upgrades are needed. We note that the AEE (p16) states that the applicant will reassess upgrades required for a 65% reduction in gross stormwater flow if the target of 85% is not achieved. How different would the results of the hydrodynamic modelling be if they had been based on a 65% reduction in inflow?

As described in the AEE, and discussed further in the response below, Council has undertaken a range of studies, network modelling and assessments over a number of years to understand the wastewater network and its response to rainfall and associated stormwater ingress into the system. The conclusion of this work is that stormwater ingress into the network occurs through several mechanisms, with the predominant one being direct stormwater inflow.

The wastewater modelling indicates that removal of 85% of the direct inflow is required to achieve a 2-year ARI wet weather containment standard (no overflow in rainfall events up to the 50% AEP) with minimal network upgrading. However, the application is not predicated on this level of direct inflow reduction being achieved. As discussed in Section 2.3.3 of the AEE, the wastewater network modelling (Appendix C of the AEE) has also considered lesser levels of inflow reduction (65 and 75% of direct inflow) and the corresponding network upgrades that are required to achieve the target wet weather containment standard. Accordingly, these upgrades are an option to achieve the target of no wet weather overflows in a 50% AEP rain event – if 85% stormwater inflow cannot be removed.

In summary, Council is seeking to progressively reduce stormwater inflow and infiltration into the network and undertake other measures to achieve no wet weather overflows in a 50% AEP rain event within 10 years. This is a key target of the consent. While Council is confident that this can be achieved, primarily through stormwater inflow (and infiltration) reduction, it has the option of carrying out additional wastewater network upgrades should this be necessary.

(iii) Please clarify what recent (i.e. in the last two years) network investigations and flow monitoring have led to the determination/conclusion that the private wastewater network is having a high/medium impact on inflow and infiltration (I&I). We acknowledge that the sources identified in Figure 6 can both be significant contributors to I&I, however the evidence base to substantiate this position is not readily apparent from the submitted material.

(iv) Please clarify what the initial model conditions were (time of day, time of year, etc)? Assuming dry initial conditions may mean that system performance (i.e. wet weather spill frequency and volume) is predicted to be better than it actually is.

(v) Please clarify how the wastewater hydraulic model was calibrated and the suitability of that calibration for undertaking overflow frequency assessments.

(vi) Please discuss the application of the TP108 storm profile, in particular the applicability to the Gisborne region and why alternative approaches (e.g. a long term simulations) were not adopted?

(vii) The wastewater hydraulic modelling utilized the now superseded HIRDS (v3) rainfall dataset. Please provide sufficient evidence that the difference between HIRDS (v3) and HIRDS (v4) does not result in significant changes to the modelled performance of the wastewater network.

(viii) Please advise if the applicant's previous networking monitoring followed the guidance and methodology outlined in the Water NZ Infiltration and Inflow Control Manual Volume 1, 2ndedition, March 2015 to quantify:

a. Groundwater infiltration (GWI) or base flow;

b. Rainfall Dependent Inflow and Infiltration (RDII); and

c. Wet Weather Peak Flow factor, defined by stormwater inflow (SWI).

Please refer to Attachment B for the response to these questions. As outlined in Attachment B, the development and calibration of the Gisborne wastewater network model has been undertaken over a number of years and was recalibrated to reflect flow monitoring undertaken in 2014 (Attachment B1), with network flow monitoring sites specifically located near overflow valves to assist in calibrating and modelling wet weather overflow performance.

The model and the work undertaken provides confidence in Council's understanding of the performance of the wastewater network, the causes of wastewater overflows, and the level of stormwater removal required to achieve the proposed consent targets. As outlined in the AEE, Council's inspection programme that is being implemented as part of the DrainWise programme has confirmed that there are a high number of drainage issues on private property.

Hydrodynamic Modelling

(ix) The MetOcean modelling report lacks some important detail/metadata to explain model set-up, including type and source(s) of data that were used as inputs to the model, as well as the statistics used, the rationale for selection and any assumptions made. Please provide:

a. More information is needed on model set-up, in particular:

- *How are tides implemented?*
- *What density did they initialise with?*
- *What density was the riverine inputs (presumably salinity was zero, but what was the water temperature)?*
- *What are the offshore boundary conditions?*

- *Where did the bathymetry come from?*
- *Where did the wind estimates come from?*

b. *Brief commentary on what post-processing (p21) involved.*

c. *More information the data that were used as inputs to the model, including the source(s) of the data, the statistic used, the rationale for selection and any assumptions made. In particular:*

   - *The wind conditions modelled; p17 refers to the scenarios modelled being "representative of typical wind speed during storm event" but no information source is provided for Table 2-1 (p19) to explain the selection of the scenarios in Table 2-1.*
   - *Commentary on the rationale for the selection of a constant wind field and verification that using a constant wind field is likely to represent conservative or worst-case mixing. One verification option would be to identify the location(s) of maximum predicted contaminant concentrations within the plume under the two wind direction scenarios modelled to confirm if these fall within or close to one of 13 'analysis' locations shown in Figure 3.1. This would add confidence that the selected upper bound of the model has captured worst-case receiving water concentrations. An alternative could be to model a few realistic-wind-forcing scenarios to identify the influence that finer spatial and temporal scale wind speed and direction variation has on predicted water quality in Tūranganui-a-Kiwa/Poverty Bay.*
   - *Overflow volumes and river flows modelled; no information source or explanation is provided for the numbers used in Tables 2-2 and 2-3 (e.g. date range, number of data points, statistic used and rationale for selection).*
   - *Clarification of the wastewater contaminant concentrations modelled, including the source of the data and rationale for the statistic(s) used. As part of this, please provide a detailed tabulated assessment of overflow contaminant concentrations, both monitored and modelled, including a suite of summary statistics (e.g. 10th, median, mean, 80th and 90th percentile nutrient, total suspended solids and faecal indicator bacteria concentrations and the number of data points on and date range over which these have been generated).*

d. *A brief discussion about potential storm events and wind fields might change over the course of the proposed 20-year consent term and how these changes would affect the modelled results.*

These questions are predominantly responded to in Attachment C.

In respect of the source of/basis for the overflow volumes that were modelled (question (ix)(c) – 3rd bullet), these were provided to MetOcean by Beca (Appendix K of the AEE). The overflow volumes resulted from the modelling of the 2 and 10 year ARI events, as discussed in Attachment B.

In respect of the modelled contaminant concentrations (question (ix)(c) – 4th bullet), these were provided to MetOcean Limited and were generally based on the in-network monitoring of three network (in-pipe) sites as discussed in the River Water Quality Monitoring report – Appendix I of the AEE – in April and May 2017. The requested summary statistics for the parameters is provided in Table 1 below.

Table 1: Network wet weather contaminant concentrations – summary statistics

	Parameter			
	Enterococci (CFU/100 ml)	TKN (mg/l)	Total P (mg/l)	TSS (mg/l)
Modelled (MetOcean)	**2,500,000**	**40**	**5.05**	**240**
Number of Samples	36	36	36	36
Mean	1,335,386	17.9	2.5	119
Median	410,000	15.0	1.9	100
10%ile	101,000	6.1	1.1	41
80%ile	2,200,000	25.3	3.5	183
90%ile	4,380,000	36.0	5.1	217

As can be seen from the above, the modelled concentrations are generally the 90th percentile concentration of the sampled wastewater. However, the following should be noted:

1) The in-pipe network wastewater sampling was undertaken during a heavy rainfall event, but one that did not result in a wet weather overflow. As a result, the sampled wastewater is likely to be less diluted by stormwater than during an overflow event and hence the model contaminant concentrations are likely to be higher than may be expected for an overflow event.

2) As discussed in Appendix I (Section 4.2.1) of the AEE, the in-pipe monitoring included a network location (Munro St) that is some distance away from the overflow locations and the areas of high stormwater inflow. This site had generally higher contaminant concentrations, likely as a result of lower stormwater dilution, and hence is considered less representative of contaminant concentrations in wet weather overflows. The data from Munro St is included in the statistical analysis above. However, if the data from Munro St is removed from the analysis, the 90%ile wet weather wastewater Enterococci concentration reduces to approximately 2,000,000 CFU/100 mL.

Accordingly, the enterococci concentration used and presented in the hydrodynamic modelling was amended to 2,500,000 CFU/100ml as a representative maximum enterococci concentration during overflow events.

However please note that, as discussed below, the QRMA assessment took an even more conservative approach that utilised pathogen concentrations from published information/other QRMAs (which were greater than those sampled in Gisborne wastewater) and assumed that the overflow discharge comprised 100% wastewater and was not diluted by stormwater.

Ecological and Public Health Outcomes/Effects

x. The commentary in the application and the technical assessments is largely focused on wet weather overflows despite 25% of known dry weather overflows in the past five years having reached a waterway. While dry weather overflows are likely to be short-lived and localised, they have the potential to cause significant in-stream effects, particularly if they occur at a time of low flow/ and low tide in summer and/or coincide with contact recreation-based activity. Please provide an assessment of the potential effects of dry weather overflows on ecological and human health. This could include basic calculations of expected in-river dilution based on different estimated quantities of discharge and different dry-weather flow conditions, with the resultant instream contaminant concentrations compared against relevant guidelines and standards for ecological and human health.

An assessment of potential ecological and human health (bathing) effects of dry weather overflows that may reach a waterway is provided in Attachment D.

This assessment concludes that water quality in Gisborne's main rivers may be affected by a large dry weather overflow to an extent that they are likely to be unsuitable for human contact recreation, particularly under worst case conditions (low river flow + maximum dry weather discharge + all the discharge reaching the waterway). Not surprisingly, microbial water quality in small rivers will be more significantly affected by a large dry weather overflow due to the small river flow and hence available dilution. However, these small rivers are unlikely to be used for contact recreation. Furthermore, potential health risks are responded to as part of Council's contractor's response. Council has recently updated its dry weather overflow response protocols. This updated response protocol, together with material associated with its 'roll out' to Council's wastewater network contractor, is provided in Attachment E.

In respect of ecological effects, estimated ammonia concentrations suggest that aquatic fauna are unlikely to be adversely affected during a dry weather overflow, with the exception of a maximum discharge with a high ammonia concentration into a small river. However, as discussed in Attachment D, even such a short-term worst-case event is unlikely to result in acute toxic effects.

x(con) Commentary should also be provided on the influence of tidal state/mixing and the main trade waste sources and associated contaminants that have the potential to enter the rivers via overflow discharges.

The tidal state and mixing have been addressed in Attachment D.

In respect of trade waste contribution, the Gisborne wastewater network has a separate industrial line that currently services five major Gisborne industries (See Section 2.2.3 of the AEE). This line is managed independently of the wider network and does not have formal overflow points on it.

The main public wastewater network also receives wastewater from commercial, including food and beverage, and industrial premises. Industrial trade waste is not considered a substantial component of wet weather wastewater overflows as these overflows occur primarily occur as a result of stormwater inflow from residential areas and primary and secondary overflow points discharge wastewater and stormwater from almost exclusively residential areas. While industrial uses are generally absent from these areas, there are some commercial areas within the contributing catchments, but these would generally comprise domestic type discharges.

Industrial trade waste could be present in a dry weather overflow, should one occur in or downstream of an industrial area. However, given the small wastewater volumes associated with dry weather overflows, the contribution of industrial-type wastewater is expected to be minimal.

(xi) Several aspects of the Quantitative Microbial Risk Assessment (QMRA) report (Streamlined Ltd) require clarification to understand all of the assumptions which apply. For example, it is unclear what "a limited microbiological analysis of the WWTP influent samples" (p18) means in practice, in terms of the number of samples and conditions under which sampling was undertaken. It is also unclear what methods the raw pathogen concentrations listed in Table 3 were based on (e.g. infectious units vs PCR analysis for adenovirus) and whether or not some 'harmonisation' of data was needed for the influent concentrations to be applied to the dose-response model. Please:

a. Provide a copy of the GDC-DNAture 2019 pathogen results.

b. Clarify if the enterovirus and adenovirus dose response curves were developed using cultured virus counts based on qPCR-based measures of enterovirus and adenovirus. If so, this may yield either over or underestimates of risk because molecular methods of PCR may over or underestimate the number of infectious viruses (e.g. adenovirus has been detected more frequently by qPCR in urban rivers than by infectivity assay). This needs to be acknowledged in the report to provide a more complete understanding of the QMRA's assumptions.

c. Clarify if the concentrations of norovirus in Table 3 are based on both GI and GII. Currently there is only one dose response model available for norovirus (for GI). Consequently, the quoted norovirus risks may represent an under or over-estimation of the actual risks depending on the infectivity of the GII norovirus.

d. Advise what assumptions have been made regarding the proportion of the adenovirus concentration shown in the Table 3 that relate to Adenovirus 4 – the report says adenovirus is used as a model virus for respiratory disease using the dose response model for Adenovirus 4 but Adenovirus 4 will only make up a small proportion of adenovirus species. If no assumption has been made and the concentration range shown in Table 3 (2,000 – 30,000,000) is used to randomly sample potential concentrations of AdV 4 in the QMRA model, then this will markedly over-estimate the risk of respiratory illness from contract recreation.

(xii) River sediments and beach sands have been recognised as reservoirs for pathogens and epidemiological studies have shown that exposure to these can increase the risk of gastroenteritis. Please comment on the potential risk of exposure to pathogens during dry weather when tidal and wind conditions can resuspend bottom sand/sediment and into the water column.

These questions are responded to in Attachment F. While the requested DNAture pathogen results are included in this response, we note that the QRMA utilised more conservative (several orders of magnitude higher) concentrations based on published New Zealand data to ensure a conservative QRMA consistent with best practice.

(xiii) Please comment on the types of shellfish found and typically harvested at each of the locations modelled by MetOcean and discussed in the QMRA report. In particular, the health risk from consumption of raw shellfish is predicted to reduce from "high" (current risk) to "moderate" at sites 6, 7 and 8 under the future 10-year ARI scenario. Are shellfish present at and harvested from these sites?

Council is unable to advise specifically what shellfish species are found and harvested at each model location. However, Palmer (2010)[1] provides information on the species that are found and harvested in Tūranganui a Kiwa/Poverty Bay. Where relevant, we have indicated the nearest QRMA modelling sites to these locations. The report advises:

- Crayfish (*Jasus edwardsii*), are one of the key species harvested, and there is a high level of take from commercial, recreational and customary fishers in this area, including from the rocks Tokomaru and Te Moana.
- Paua, kina, pu pu, and parengo are also harvested from this wider area, and the reefs below Tītīrangi Maunga (Kaiti Reef) and nearby Tuamotu Island and Sponge Bay are popular venues for the local people gathering these species. These locations are near sites 2 and 3 in the QRMA report.
- Within the Tūranganui and Waimata Rivers mussels are frequently harvested. There are places where this occurred prior to the city's development, and more recently also include other sites where spat has attached to the bridge and wharf piles and along the harbour breakwater. Anecdotal evidence suggests that, despite signs warning of the potential health risks, the consumption of mussels from this area is widespread. These locations are approximated by sites 4, 6 and 8 in the QRMA report.
- Between the Tūranganui rivermouth and the Waipaoa River, there are a wide variety of bivalve shellfish present, and tuatua (*Paphies subtriangulata*) are also frequently collected from this stretch of coast.
- A monitoring site along Midway Beach, approximately 200 metres southwest of the Midway Surf Lifesaving Clubhouse (nearest site – Site 9 in QRMA report) indicates that bivalve species of economic, subsistence and cultural value gathered in this location include tuatua, surf clams (*Mactra* species), mussels (*Perna canaliculus* and *Mytilus edulis aoteanus*), triangle shell (*Spisula aequilatera*), pipi (*Paphies australis*) and common cockles (*Chione stuchburyi*).

(xiv) The overflow discharges increase the level of microbial contamination in the receiving environment and therefore the potential risk to human health, particularly under southeasterly winds where the modelling indicates that the Tūranganui River plume is maintained near its mouth and along Waikanae Beach. Please describe the types and extent of mahinga kai and recreational activities that occur in the lower river reaches and nearshore coastal waters and how health risk is communicated to the public in relation to dry weather discharges. Please also comment on options to develop a more proactive approach to managing risks to human health, including a communication plan that builds on the key findings of the assessment work carried out to date on the influence rainfall, wind, tide and other factors (e.g. other influences on water quality in the absence of overflow events) have on receiving water quality at various locations.

We have discussed the mahinga kai species that are present in this area in our response to the question above. In respect of recreational activities, the lower Tūranganui River, Waikanae and Midway Beaches are key recreational areas within Gisborne and are host to a range of water activities that include swimming, surfing and waka ama.

In respect of the management of public health risk, overflow reduction is the primary focus of the DrainWise Programme, with the aim of reducing and minimising both wet and dry weather overflows as far as practicable. The focus for wet weather overflows is the removal of stormwater ingress to the wastewater network to reduce the frequency, duration and volume of overflow events together with investment in the drainage network. Actions to minimise the occurrence of dry weather overflows includes proactive network

[1] Te Moananui o Te Turanganui a Kiwa - Social Outcomes Evaluation of the Gisborne City Wastewater Treatment Project 2010 to 2013: Part 1: Baseline Information 2010. Palmer, M. 2010.

maintenance/cleaning and public education – the latter being particularly important given the typical causes of dry weather overflows.

Council is also currently updating its overflow response protocols to improve the public health management of both dry and wet weather overflows, should they occur. This includes extending the list of parties and stakeholder groups (including waka ama, rowing, surf etc.) that are notified of an overflow event and working with tangata whenua to improve the response from a cultural perspective – including the placement and lifting of rahui. It also includes proactive notification, to provide stakeholders with an advance warning if predicted heavy rainfall may result in wastewater overflows.

At this stage, Council has not progressed a predictive, model based public health warning system as is utilised in Auckland. We note that the Gisborne wastewater network is different to that of Auckland (and most other councils) in that Gisborne wet weather overflow events require overflow valves to be opened (i.e. they are not automatic and are not unmonitored). Hence Council knows exactly when and where wet weather overflows occur and can advise the public accordingly. In Auckland, the combined stormwater/wastewater network is designed to overflow in larger rain events and this occurs automatically when the systems are overloaded. Furthermore, all overflows enter the same river system and moana and will generally affect the same general area i.e. it would likely be difficult to differentiate between the events in terms of risk and differences in notification approaches are unlikely to be warranted.

(xv) *In relation to the river water quality report (4Sight Ltd), what was the hydrological significance (e.g. ARI) of each of the overflow events monitored, including the "heavy 'rainfall only' event" that was sampled over 12-18 March 2018 (s2.2, p7)? In addition, please tabulate for each sampling event and comment on tidal height (low, mid or high) and state (ebb or flow) and wind direction and intensity, together with the number of overflow valves open at any one time, given that these factors all combine to influence the effect of the discharges on river water quality. Please also comment on how the monitoring results – which reflect past/current discharge locations – likely translate to proposed future discharge locations.*

These questions are responded to in Attachment D. The hydrological significance of the sampled events is based on the hydrological assessment that was provided in Appendix D of the AEE.

(xvi) *The river water quality report (4Sight Ltd) highlights the poor condition of Kopuawhakapata Stream of which discharges from the wastewater network are a contributing factor. What actions and over what timeframes does the applicant propose to take to reduce the impact of the wastewater network on the stream, including investigation of potential dry weather wastewater leaks and cross connections?*

As indicated in the monitoring report, and in Council's state of the environment monitoring, the Kopuawhakapata Stream shows evidence of chronic microbial contamination that goes beyond what may result from occasional dry or wet weather overflows. The poor condition of this stream has also been raised during on-going engagement with Tangata Whenua, via Council's KIWA Group.

In response to these concerns, Council has initiated the development of a watercourse management plan for the Kopuawhakapata Stream. Work on this plan commenced in November 2020 and has included sampling of stormwater inflows along the stream length to identify the point at which contaminated stormwater enters the stream - initial results indicate that this occurs near the upper reaches of the stream, at two locations. Further samples have been taken from the stormwater network to continue to track the source of this contaminated stormwater upstream in the network, and this assessment is on-going.

The watercourse management plan is programmed to be completed in the first half of 2021 and will include a series of actions aimed at improving the water quality, ecological and cultural attributes of the stream. At this time we are unable to advise the programme and associated timeframes for remedial works as these are currently unknown. However, any identified cross-connections and wastewater inputs into the stream will be remedied as a priority as soon as evident. It is also important to recognise that remedial works and improvements are likely to extend beyond those relating to the wastewater network.

Matters arising from submissions

(xvii) *A number of submissions challenge the term of consent and related to this is a concern that Council is not affording the necessary priority to the reduction of infiltration and inflow to reduce the overflow events. This matter will be further addressed through the hearings process. At this stage, can you please advise and provide further assessment/commentary on:*

- *the need for a 20-year consent term and how priority has been assigned to the project (this may include reference to Council's Long-Term Plan;*

The rationale for, and appropriateness of, a 20 year term is outlined in section 8.15 of the AEE. In short, the Gisborne wastewater network is fundamental public infrastructure and a lifeline utility, with a replacement value of $161m, that provides for the essential conveyance of wastewater from the Gisborne urban area for treatment and safe disposal. In our view, essential public infrastructure should be subject to long term consents to reflect their essential and enduring function, particularly where effects can be appropriately managed through consent conditions (as is the case here).

It is acknowledged that wet and dry weather overflow discharges from the network are not desirable. However, they are an inevitable consequence of having a wastewater network that has been developed, extended and refined over a period of more than 100 years. We note that, as demonstrated in Section 2.6 of the AEE, the dry and wet weather overflow performance of the Gisborne wastewater network is already currently on-par with the better performing councils nationally and the DrainWise programme will substantially reduce stormwater ingress and improve wet weather overflow performance.

As is detailed in Section 8.15, requiring a short-term consent is a 'blunt instrument' by which to manage adverse effects, and will not necessarily lead to better outcomes for the community. Having to frequently reconsent the discharge, even when the overflow reduction programme is on target, will direct expenditure and resource away from resolving problems 'on the ground' to further investigations, assessment and substantial consenting costs.

In our view, a term of 20 years is consistent with the essential function and scale of the network, the confidence that is held on the causes of and solutions to overflows and the time necessary for the programme to be implemented in a way that is affordable to the community. Effects can be managed through suitable consent conditions.

Importantly, the cost of remedy of the primary causes of the overflow will rest with homeowners, as the primary cause of the overflows is the responsibility of homeowners (it is on private property). Council has taken a compassionate approach to its community, and set its compliance and enforcement process to be delivered over a ten year timeframe so that the financial burden is affordable for homeowners.

In respect of the priority afforded to the project in Council's Long Term Plan (LTP), the wastewater network, including the DrainWise programme and capital investment in the network, have been subject to the same prioritisation processes as other areas of Council expenditure. Council has carefully considered its functions and expenditure across a range of critical areas, the impact of potential rate rises on its community and its ability to debt-fund long term infrastructure – noting that the predominant source of stormwater ingress is on private property.

Council has also carefully considered the implications of public expenditure on private property drainage assets through its Infrastructure Improvement on Private Property Strategy (IIOPPS) to ensure that it has achieved an appropriate balance between public and private investment in resolving on-property drainage issues.

Overall, Council considers that it has given appropriate priority to reducing wastewater overflows and the expenditure and the balance between public/private responsibility was agreed with the community through the LTP.

- *how any draft conditions integrate with the proposed consent term*

The draft conditions include a number of requirements that are consistent with a long consent term being approved. These include:

- Short and medium term (10 year) targets (Tables 14 and 15), with the expectation that new targets will be set by review – both during and following this period;
- A significant commitment to continue a productive relationship with Tangata Whenua, that is evidenced by the significant on-going work being undertaken with the KIWA Group;
- A high level of transparency – evidenced by substantial annual and five yearly reporting of performance, trends and outcomes;
- Statutory review conditions that enable the refinement of the consent as required.

- *Policy C6.2.2.9 provides a directive policy that a term for any wastewater network discharge shall be no more than 5 years except where there is evidence is available from past performance that clause (b) – 50 % probability of overflow occurrence is achieved. Can you please provide further discussion on the performance of the network in relation to this policy.*

Policy C6.2.2.9 includes three subclauses:

a. Minimise the frequency of overflows.

Minimising the frequency and volume of wet and dry weather overflows is a fundamental focus of the management of the wastewater network, as outlined in the AEE.

b. Achieve performance of an overflow occurrence of no more than 50% probability in any given year.

This (wet weather) performance target has been proposed in the AEE and associated conditions, with the aim of achieving it within ten years. This period of time has been adopted in light of the complexity, challenges and costs associated with reducing stormwater inputs, particularly from private property.

c. Issue discharge permits for no longer than 5 years except where there is evidence from past performance to demonstrate that wastewater overflow events can reliably achieve the performance standard in clause b. above.

Council considers that its past performance, and programme moving forward, demonstrates that it can reliably achieve the targeted overflow performance. These past and current measures include:

- An investment strategy (see Section 2.3.2 of the AEE) to ensure the public wastewater network is appropriately developed and sized in accordance with best national practice. As indicated in Section 2.2.2, modelling has confirmed that the network is sized to cater for 6 times average dry weather flow.
- Investment into stormwater public network extensions to ensure homeowners can adequately dispose of their stormwater and that catchment scale stormwater issues are remedied.
- The removal of all uncontrolled overflow points and their replacement with valved overflows that require manual intervention for wet weather overflows to occur. This has been a critical step to ensure that wet weather overflows do not occur automatically and are not 'under the radar'.
- The integration of pressure transducers and telemetry into the wastewater network to enable real-time monitoring of network flows to enable effective management of the wastewater network, to ensure that overflows occur only when absolutely necessary to avoid discharges to private land.
- The development of a wastewater network model to ensure that network performance is well understood and to guide future infrastructure investment.
- A progressive reduction in overflow volume (see Figure 7 of the AEE).
- A clear plan (the DrainWise programme) moving forward to achieve the reduction in stormwater ingress into the wastewater network.
- A dedicated team implementing the DrainWise programme, incorporating a programme manager, technicians and administration support, as well as public awareness campaigns and messaging.
- Options for network investment should the elimination of stormwater ingress be less than the target level of 85% - which can then be incorporated into future LTPs as necessary.

In summary, over the past ten or more years, Council has implemented a systematic approach to reducing wastewater overflows. The initial focus of this work was the public network – with the aim of ensuring that it is designed, constructed and operated to best practice. This has been successfully achieved to the point where the overflow performance of the network is consistent with best performance nationally.

The next stage of improvement is to reduce overflows to achieve a meet a standard of no overflows in a 50% AEP rain event in ten years – with a focus on the ingress of stormwater on private property. This is supported by a dedicated wastewater network model and a good understanding of the wastewater network and causes of overflows, an extensive implementation plan (which is currently being implemented by a dedicated team), an appropriate level of investment and a high level of monitoring and reporting.

Accordingly, Council considers that the desired level of overflow performance can be reliably achieved in the timeframes proposed in the AEE.

(xviii) *The scope and assessment of alternatives to the management and response of overflow discharges has been questioned including the provision of additional wastewater overflow storage. We note that the application material does discuss other options however can you please provide any additional information/assessment on alternative options with specific focus on storage options as a means to avoid or reduce wastewater overflow discharges?*

Council's summary of the alternative options that have been considered is summarised in section 3.5 of the AEE. As indicated in that assessment, it has considered the option of providing additional storage capacity within the network but considers that such an approach is not the best option at this time. However, as requested, more detail is provided below.

1) Council has previously installed a 90 cubic metre storage tank at Steele Road at a cost of approximately $550k. The purpose of this tank was as part of a pump station upgrade which, due its location and site constraints, had insufficient wetwell storage. This was resolved with this additional storage, which was required as this site experiences power outages and has a longer lead time for Council's contractor to respond. While this was a relatively small wastewater storage project, it has provided insight into the practicality and costs of utilising wet weather storage within existing urban areas.

2) In terms of potential storage options, Council has at a high level considered storage at the two primary (Wainui + Seymour/Turenne) and two secondary (Palmerston/Peel + Oak Street) overflow points. This assessment considered the cost of overflow storage at each of these locations to capture both the maximum and average overflow volumes at these locations at this time (current overflow volumes). This analysis concluded that the cost of providing storage at these locations ranged from $128M (average overflow volume) to $262M (maximum overflow volume).

3) The investment costs are substantial, particularly for a facility that will be currently utilised only two to three times per year – and ultimately significantly less often. A key additional issue is the practicality of siting large overflow storage facilities to capture such a substantial volume of wastewater. As storage facilities are necessarily located near the point of overflow, this would require substantial use of predominantly existing residential land and roads. Further, unless the cause of stormwater ingress is addressed at its source, overflow volumes will increase as the network continues to age and more stormwater enters. Storage facilities would also require additional management and maintenance to minimise odours, and wastewater storage to cater for current volumes sited in an existing residential area would be problematic.

Council stresses that additional overflow storage remains an option. However, it continues to be of the firm view that the best approach is to reduce stormwater ingress as far as possible first, and then re-consider storage once overflow volumes are reduced to a level where it becomes more feasible.

Notwithstanding this, Council continues to identify and investigate options to improve the performance of the network. A recent example is consideration of additional wet weather pumping capacity to relieve pressure in the wastewater network due to stormwater ingress. While this investigation is on-going, it may be a way of making available storage capacity in other areas of the network available to cater for wet weather flows.

A further option that Council has sought to progress is to obtain additional funding to accelerate the replacement/upgrading of private infrastructure. Additional funding would enable Council to undertake private property infrastructure improvements without imparting an unaffordable financial burden on the community. In this regard, Council has made a number of funding applications to Central Government. At this time, the funding applications have not been successful. However, Council continues to pursue additional funding opportunities as they arise.

(xix) *There are a number of localised issues raised in individual submissions, including issues associated with potential effects on school grounds raised by the Ministry of Education. Can you please confirm whether there will be further discussions with these submitters and assessment undertaken to address these localised issues including:*

- *Seymore Road, Sub #4, Sub#5, Sub#16, Sub#19*
- *Turenne St, Sub#9*
- *Schools, Sub#10, Illminster School Sub#13*
- *Graham Road, Sub#12*

We acknowledge the concern that has been raised by the community in relation to the Seymour/Turenne primary overflow and the potential to affect private property and schools. This area has been a focus of past assessment and work and, following submissions, has been the focus of recent investigations with the aim of either removing this overflow entirely or if this is not possible retaining it for use as a tertiary overflow point (only in extreme rainfall events).

A summary of the work that has been undertaken to date has been prepared for this s92 response and is attached as Attachment G. However, please note that this work is still in progress and is yet to be completed – with the aim of having a confirmed position for submitters prior to the hearing. Accordingly, this assessment should be considered a draft.

(xx) *The NPS- Freshwater Management 2020 came into force on 3 September 2020 and this now requires that freshwater is managed to give effect to Te Mana o te Wai as well as amending various other provisions of the earlier NPS. The NPS- Freshwater Management 2020 will need to be addressed as part of the hearing evidence. At this stage, we consider it would be useful for the applicant to provide commentary and assessment on the NPS- Freshwater Management 2020 taking into account the matters raised in submissions.*

A preliminary assessment of the NPS FM 2020 is provided as Attachment H. As noted in the assessment, the interpretation and application of the NPS FM 2020 is in its infancy, with little guidance or case law to rely on. Accordingly, we have provided this as a draft of our current interpretation of its application to the overflow consent but reserve the right to amend this as caselaw and guidance as to its interpretation develops.