REPORT 6
(1215/52/IM)

MOA POINT WASTEWATER TREATMENT PLANT AND CAREY'S GULLY SLUDGE DEWATERING PLANT AND SLUDGE DISPOSAL AT THE SOUTHERN LANDFILL – RESOURCE CONSENT APPLICATIONS

1. Purpose of Report

The purpose of this report is to set out the background, the process and the timeline for the Strategy and Policy Committee to receive reports regarding the consent renewal applications for the Moa Point Wastewater Treatment Plant and Carey's Gully Sludge Dewatering Plant.

2. Recommendations

It is recommended that the Committee:

1. *Receive the information.*

2. *Agree to the proposed timeline and process for the application for resource consents for the Carey's Gully Sludge Dewatering Plant and sludge disposal to the landfill for terms of 35 years.*

3. *Note that officers will report further to the Strategy and Policy Committee on the key elements of the resource consent applications for the Moa Point Wastewater Treatment Plant including the proposed approach to the management of bypass discharges from the long outfall during extreme wet weather.*

3. Background

3.1 Moa Point Wastewater Treatment Plant

The Moa Point Plant was commissioned in 1997 and was fully operational in January 1998. The plant currently receives and treats wastewater from a residential population of approximately 136,000. The catchment is approximately 5,500 hectares. Its collection system includes approximately 820km of reticulation and interceptor sewer that convey the flows to the Moa Point Wastewater Treatment Plant.

The essential features of the Moa Point treatment plant and process are:

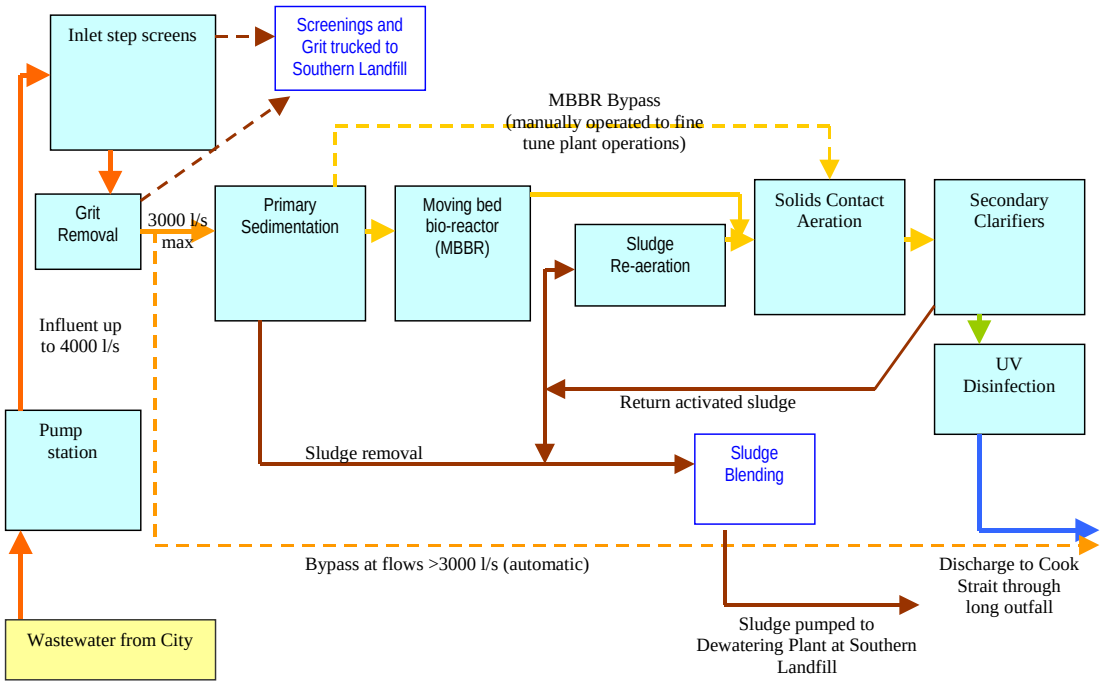
- A pump station, which is contracted to pump up to 4,000 litres per second (l/s), lifts the wastewater arriving at Moa Point up to the Treatment Plant;

- Buildings and structures, which provide for physical treatment involving screening, grit removal and primary sedimentation, secondary treatment involving biological processes, secondary clarification, and ultra-violet (UV) disinfection; and

- The 1.8km ocean outfall (long outfall) through which effluent is discharged to Cook Strait.

Screened wastewater flows into sedimentation tanks where approximately 60% of the solids are removed as sludge to the Carey's Gully landfill site. The remaining wastewater is then subjected to aeration and biological treatment before passing into clarifiers where residual solids settle out and the clarified effluent flows off the top to the UV disinfection plant. The UV light destroys bacteria that might be harmful to human health or the environment.

Figure 1: Wastewater Treatment Process



Following this high quality treatment, the treated wastewater flows through the 1.8km long outfall into Cook Strait and discharges through a multi-port diffuser at a water depth of 21 metres around 2.5km from the Lyall Bay shoreline. Under the current diffuser configuration, 26 ports are open and an initial dilution of at least 100:1 is achieved at all times.

The primary sedimentation tanks, biological process unit and UV disinfection unit at the Moa Point Plant have a capacity to treat 3,000 l/s, four times the 2006 average dry weather flow (ADWF) of 760 l/s. This ratio is consistent with other treatment plants throughout New Zealand.
Prior to the commissioning of the Moa point wastewater Treatment Plant, sewage from the catchment was milliscreened and discharged through the short outfall at Lavender Bay. While the short outfall has not been used on a continuous basis since the plant was commissioned, the short outfall has been retained as an emergency overflow for unavoidable discharges such as an unforeseen mechanical failure of the pump station. Discharges from the short outfall are not consented and it is not proposed that consents are sought.

3.2 Wet weather overflows at the Moa Point Wastewater Treatment Plant (bypass discharges) and from the wider network

In 1999 the Council triplicated the Kilbirnie interceptor which increased the flows able to be transferred to Moa Point from a maximum of approximately 3000 l/s to approximately 4000 l/s to reduce overflows from the wastewater network. As a result, during extreme wet weather events, wastewater flows to the Moa Point Plant can exceed the Plant's treatment capacity of 3,000 l/s.

All wastewater arriving under these circumstances still passes through the step screens and grit removal unit. Any flow in excess of 3,000 l/s automatically bypasses the primary and secondary treatment systems and UV disinfection unit and passes directly into the ocean outfall, where it is mixed with the fully treated effluent and discharged to Cook Strait.

Approximately twenty wet weather events between November 1999 and October 2006 have caused bypass overflows through the long outfall (Table 1). The circumstances that cause a bypass event are influenced by the intensity and duration of a specific rainfall event, the weather conditions preceding the event (e.g. if soils are wet and therefore have limited storage capacity), and the distribution of rainfall within the catchment.

The majority of overflows are small volume discharges and, on the actual day, represent an average of approximately only 2% of the total daily flow discharged at Moa Pt. Considered annually, the Moa Point Wastewater Treatment Plant currently operates within its discharge capacity 99.95% of the time.

Figure 2 shows the relative scale of overflows through the long outfall between November 1999 and October 2006. The data contained in Figure 2 is derived from Table 1, which shows twenty wet weather bypass events at Moa Point over the seven year period.

Figure 2: Overflows from the long outfall at the Moa Point Wastewater Treatment Plant since November 1999

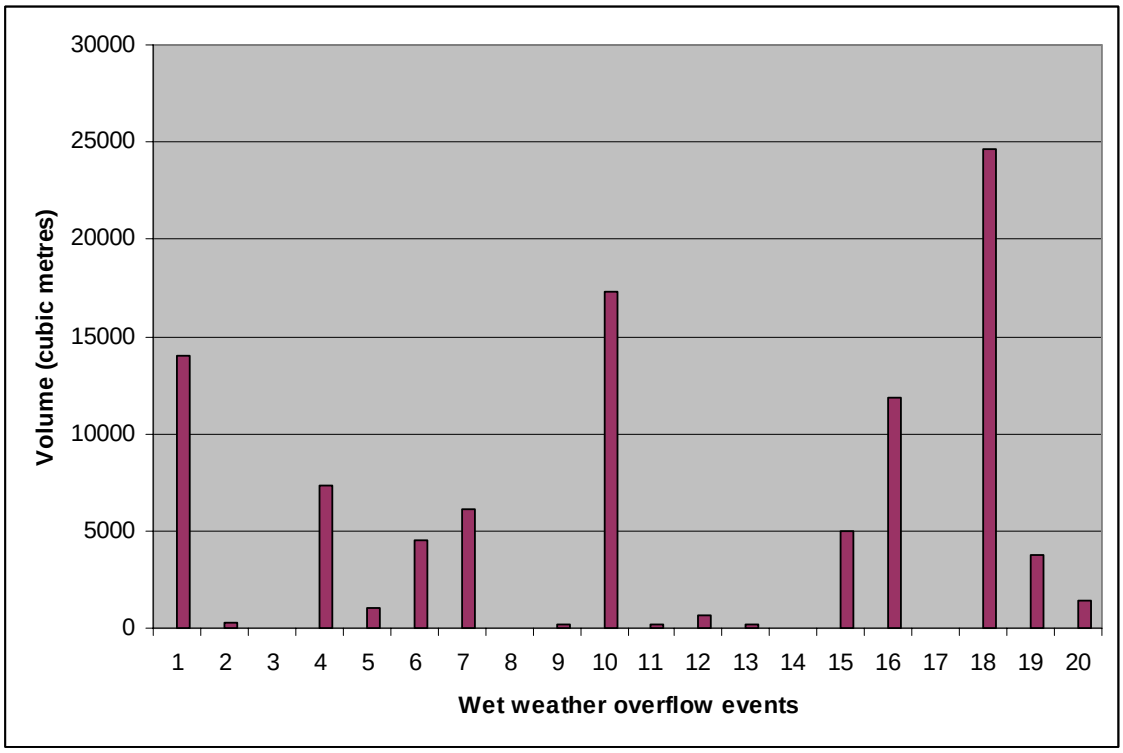


Table 1: Overflows from the long outfall at the Moa Point Wastewater treatment Plant between November 1999 and October 2006 and the duration of the associated wet weather events

	Date	Overflow Volume (m^3)	Duration (Hrs)		Date	Overflow Volume (m^3)	Duration (Hrs)
1	12 November 1999	14,000	10.3	**11**	2-3 May 2005	216	3.5
2	4 June 2000	319	4.5	**12**	21 May 2005	615	3.0
3	7 October 2001	15	0.05	**13**	23 May 2005	144	2.5
4	22 November 2001	7309	9.6	**14**	28 July 2005	20	1.0
5	15 January 2002	1005	1.16	**15**	4 July 2006	4940	11.5
6	17 June 2002	4484	3.16	**16**	6-7 July 2006	11,836	17.0
7	13 October 2003	6090	7.0	**17**	20 July 2006	5	1 minute
8	21 January 2004	11	0.6	**18**	26 Aug 2006	24,674	15.3
9	5-6 January 2005	215	0.5	**19**	24 Oct 2006	3,747	5.5
10	31 March 2005	17,271	9.5	**20**	29 Oct 2006	1,392	3.0

Further evaluation is being undertaken on the correlation between overflow events and rainfall return periods.

Heavy rain also results in wastewater overflows from the wider pipe network served by the Moa Point Wastewater Treatment Plant. During extreme wet weather, overflows at localised points can result in some diluted sewage being discharged to stormwater culverts around the City resulting in contaminated stormwater discharges to the Harbour and South Coast. Council currently holds resource consents for 11 of these sewage contaminated stormwater discharges, with expiry dates between 2008 and 2013.

The most significant wastewater overflows in the wider network are:

- Murphy Street wastewater overflow on the interceptor in Thorndon, discharging to the Davis St stormwater culvert to the harbour in the port area; and

- Drummond Street wastewater overflow on the interceptor in Newtown, discharging to the Overseas Passenger Terminal stormwater culvert.

The constructed overflow at Murphy Street is currently operating at about an average of four overflows per year. The overflow at Drummond St operates at an average of one overflow every 2-5 years. The existing discharge consents for both these locations expire in 2013.

3.3 Resource consents for the Moa Point Wastewater Treatment Plant

The Moa Point Wastewater Treatment Plant operates under four existing consents that expire in early January 2008. Applications for new consents must be lodged by early July 2007 to allow the plant to continue to operate under the existing resource consents until new consents are obtained.

The most significant of the existing consents with regard to the consent renewal process are the two discharge consents providing for:

- The continuous discharge of disinfected secondary treated effluent to Cook Strait via the long outfall, south of Lyall Bay, during 'normal operating' conditions that requires a effluent standard of 20g/m^3; 30g/m^3; 200 per 100ml standard for biochemical oxygen demand, suspended solids and faecal coliform bacteria (20:30:200)

- The discharge of mixed disinfected secondary treated and milliscreened wastewater to Cook Strait via the long outfall to the coastal marine area during and/or immediately after heavy rainfall when the quantity of wastewater arriving at the Moa Point Plant exceeds 3000 l/s (bypass consent)

Unlike the majority of the Clearwater resource consents (which were all obtained in the 1990s), the bypass consent was obtained in September 2004 following the triplication of the Kilbirnie interceptor, which increased the capacity for flows to Moa Point Plant. The bypass consent contained a number of conditions relating to the notification of bypass discharges, signage, monitoring, and reporting. In addition, condition 11 of the consent specified that:

"11(a) The permit holder shall investigate ways and means of eliminating bypass events and shall provide to the Manager, Consents management, Wellington Regional Council, with annual reports on the findings of these investigations. The investigations shall include, but not necessarily limited to:

a) Provision of storage of peak sewage flows at various locations within the city, including Murphy Street and Moa Point;
b) The use of Mt Albert Tunnel to store peak flows;

c) The enlargement of the Mt Victoria tunnel to store peak flows;
d) The utilisation of pump station storage to alleviate peak wet weather flows;
e) The amalgamation of sewage pump stations combined with a storage facility;
f) Enhancement of the capacity of the trunk sewer at specific locations, to reduce back-up and overflow potential;
g) Augmentation of the treatment capacity at the Moa Point Wastewater Treatment Plant, including upgrading the UV treatment capacity to treat peak flows;
h) Implementation of a comprehensive inflow and infiltration programme, targeted at specific subcatchments;

Note: there are existing consents that have their own reporting requirements and this consent does not intend to duplicate those.

i) Sophisticated screening systems to screen stormwater flows; and
j) Sustainable urban drainage technologies.

This report shall be submitted to the Manager, Consents Management, Wellington Regional Council, by 30 May each year and a final report shall be submitted at least three months prior to the expiry of this permit.

11(b) In the event that the permit holder undertakes significant remedial work as a result of the investigations referred to in condition 11(a), this work shall be described in the annual reports".

Note: there are strong expectations that by the time the expiry date for this permit is reached, the permit holder will have implemented or be in the process of implementing means of eliminating bypass discharges".

3.4 Resource consents for the Carey's Gully Dewatering Plant and disposal of sludge to the landfill

Sewage sludge, which is a mixture of 98% water and 2% solids, is produced as a by-product of treatment of sewage. The solids derive from the settlement of milliscreened sewage (primary solids) and the settlement of the treated effluent (secondary solids).

The sludge from the Moa Point Plant is pumped 9km through an underground pipeline to the dewatering plant at the Southern Landfill at Carey's Gully. Sludge is also trucked from the Western Treatment Plant.

The Carey's Gully Dewatering Plant was commissioned in 1997 and dewaters sludge by centrifuge. The dewatered sludge is loaded into skips in the sludge bay and is trucked to the adjacent composting plant for further processing or delivered to the landfill. The plant currently produces, on average, 50 tonnes of sludge per day. The effluent from the dewatering process is treated and then returned to the sewer.

The existing resource consents that authorise the operation of the dewatering plant and the discharge of sludge to the landfill and associated discharges to the air at Carey's Gully expire in mid-2007 and early 2008.

It is proposed to apply for new consents on the same basis as the current consents and for a 35 year term. It is noted that odour will be a key issue with these applications. The applications will seek a continuation of the conditions of consent that require that there is no objectionable and offensive odour at the boundary of the site.

Consultation with affected parties has commenced and the project team are endeavouring to resolve any issues raised. The closing date for the receipt of feedback from the consultation is 29 November 2006.

4 Key issues arising in the application for resource consents for Moa Point Wastewater Treatment Plant

The Council's approach to the reconsenting of the Moa Point Treatment Plant will require Council decisions on three key issues:

- the duration of the consents that will be sought at time of application (a maximum duration of 35 years is allowed under the Resource Management Act 1991);

- whether to maintain or alter the effluent quality standard discharged through the long outfall during 'normal operating' conditions; and

- to what degree the wastewater system will contain peak wet weather flows prior to discharge.

4.1 Investigation work to date to prepare the consent application

Existing consent conditions impose high quality effluent standards including a 20g/m³; 30g/m³; 200 per 100ml standard for biochemical oxygen demand, suspended solids and faecal coliform bacteria. The Plant consistently meets the standards and is normally of a significantly higher quality than required by consent conditions.

While some environmental studies are still being completed, evidence to date is that there have been significant water quality improvements on Wellington's south coast since the commissioning of the Moa Point Plant and the current environmental effects of the discharge of treated effluent from the long outfall into Cook Strait is negligible.

As part of the preparation of the new resource consent applications, it is appropriate that the Council considers the appropriate effluent quality standard, which in practical terms requires Council to consider alternatives, including whether to maintain, relax or tighten the present standard of 20:30:200 for effluent treatment. More work is being carried out regarding the effluent standard, and will be presented to Council in a future report. It should be noted that the present effluent standard at Moa Point is higher than the effluent treatment standard (50g/m³, 50g/m³; 1,000 per 100 ml) required for the Hutt Valley wastewater treatment plant located at Seaview.

With regard to wet weather overflows from Moa Point and the wider network, the Council has developed a hydraulic and hydrologic model of the interceptor sewer and associated pump station catchments to help predict the flows into the future years and the effect of implementing different options for improvement works on the flows arriving at Moa Point and in the network. The usual definition in New Zealand and Australia of catchment rainfall events whereby flows will be directed to storage/treatment before discharge is for wet weather event recurrence periods of between 6 months and 2 years.

The model currently predicts that maintaining the current operating regime towards flows arriving at Moa Point and in the wider network could result in an increase in the number of bypass discharges from the current average of two-three per year to an average of nine times per year by 2043.

Current modelling has derived a number of possible options to reduce wet weather overflows in the wider network as well as at Moa Point (Appendix 2). This work has included initial cost estimates to address these discharges.

Options for the mitigation of the wet weather overflows to the harbour and bypass discharges out the long outfall revolve around concepts of:

- Conveyance of flows:
  - To enhance the capacity of the interceptor sewer to convey flows to Moa Point (this would have a direct impact on increasing bypass discharges unless the Moa Point Plant was augmented to treat the increased flow, and has significant technical and cost implications);

- Attenuation of flows:
  - To reduce the peak flows reaching the Moa Point Treatment Plant and in the wastewater system by storage and/or diversion at one or more locations within the network

- Reduction of flows:
  - To reduce flows within the wastewater system by reducing inflow and infiltration into the network

- Treatment of overflows:
  - The treatment of overflows, such as by screening and settling of excess flows from heavy rain, at one of more locations within the network

The cost estimates for the options derived from the model are very preliminary and at this stage should be viewed only as a means of comparing options. The estimates range across a number of containment standards from 6 months to 20 year average recurrence intervals (ARI).

Further study is being carried out to confirm the accuracy of the interceptor sewer model and cost estimates and to ascertain the physical feasibility of the options. As these options relate to significant elements of the City's infrastructure and potentially involve significant capital expenditure, it is prudent for Council and the wider community to consider the benefits and costs of these options in terms of economic,

social, cultural and environmental effects, the extent to which community outcomes are promoted or achieved, and the views of interested parties.

In addition, more work will be carried out on the effects of the bypass and the costs associated with the mitigation before any recommendation is made to Council.

5 Consultation

Wellington City Council is currently consulting with the community on the continued operation of the Moa Point Wastewater Treatment Plant and sludge dewatering plant and sludge disposal at Carey's Gully. Meetings were arranged with regard to Moa point and the Landfill consents with the community liaison groups. The public consultation period closes on Wednesday 29 November 2006.

The Western Treatment Plant resource consent hearing provided strong direction for the Council to work with Tangata Whenua to address cultural effects and possible mitigation options. To put this direction into effect, the process outlined below has been established for the Moa Point resource consent application.

An initial workshop was held in late November with representatives of

- the Wellington Tenths Trust
- Port Nicholson Block Claim Team
- Te Atiawa ki te Upoko o Te Ika a Maui Potiki Trust
- Te Runanganui o Taranaki Whanui ki te Upoko o te Ika a Maui Inc
- the Polhill Gully Trust.

A separate workshop was also held with representatives of Ngati Toa.

Council officers also initiated meetings with other key stakeholders and interested parties in November this year. These meetings and discussions will continue into the New Year.

6 Proposed timeline for resource consent application process

6.1 Moa Point Resource Consent Application Process

Timeline	Activity
Ongoing to June 2007	Study of the operation of the Moa Point Treatment Plant and measures to mitigate overflows from the wastewater system, including: o modelling of interceptor sewer o physical feasibility of preliminary options o refinement of cost estimates for the preliminary options
9 October - 29 November 2006	Public Consultation, including: o publication of the Project Descriptions (high-level descriptions of the consent application) o discussions with key stakeholders and interested parties
Late November 2006	Further engagement with iwi groups
7 December 2006	Report to Strategy and Policy Committee to provide Council with: o a progress update on the resource consent process; o information relevant to the resource consent process o a supplementary paper on feedback received to date
December 2006 to March 2007	Further engagement with iwi groups, including a possible workshop with Councillors.
March 2007	Report to Strategy and Policy Committee to provide Council with: o a progress update on the resource consent process; and to o provide an update on the information to be included in the draft Assessment of Environmental Effect (AEE)
March 2007	Publication of the draft AEE, which includes views of the community gathered to date
March - April 2007	Consultation on the draft AEE, including meetings with key stakeholders, iwi, and interested parties
April 2007	Council receives Cultural Impact Report on draft AEE from iwi
May 2007	Report to Strategy and Policy Committee to provide Council with: o a progress update on the resource consent process o feedback from consultation on Draft AEE with key stakeholders and interested parties and iwi views expressed in the Cultural Impact Report; and to o seek approval for the information to be included in the final AEE
June 2007	Prepare resource consent application documents and finalise AEE
6 July 2007	Lodge resource consent application with Greater Wellington Regional Council

6.2 Carey's Gully Resource Consent Application Process

Timeline	Activity
9 October – 29 November 2006	Public Consultation, including: o publication of the Project Description (high-level description of the consent application) o discussions with key stakeholders and interested parties
Early December 2006	Publication of Draft AEE
December 2006 to mid April 2007	Consultation on Draft AEE
Mid April	Finalise AEE
End April	Lodge application with Greater Wellington Regional Council.

7. Conclusion

Council has begun to consult on the consent renewal process for the continued operation of the Moa Point Wastewater Treatment Plant and the Sludge Dewatering Plant at Carey's Gully. Further work is required to more fully develop options for the consent renewal applications.

A further report will be prepared to Strategy and Policy Committee in the New Year with a progress update on the resource consent process, and an update on the information to be included in the draft Assessment of Environmental Effect.

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Supporting Information

1)Strategic Fit / Strategic Outcome

The conclusions and recommendations in this report take into account the Council's strategic priorities and outcomes

2) LTCCP/Annual Plan reference and long term financial impact

The decisions that Council makes with regard to the options will have a significant impact on the financial position of the Council. Further information on costs will be provided in subsequent reports to the Committee to assist with a final decision.

3) Treaty of Waitangi considerations

Preliminary discussions have been held with iwi representatives on the issues and proposals contained in this report. Further consultation will be undertaken in the lead up to the consent application to enable iwi to consider fully the proposed options.

4) Decision-Making

This is a key decision for Council. Section 4 sets out the key issues and decisions Council will need to make before lodging the resource consent applications.

5) Consultation
a)General Consultation

Council is undertaking preliminary public consultation on continued operation of the Moa Point Treatment Plant and Carey's Gully.

b) Consultation with Maori

Preliminary discussions have been held with iwi representatives.

6) Legal Implications

Council's lawyers have been consulted during the development of this report and commented on a draft of this paper prior to its finalisation.

Appendix 1: Wellington Wastewater Network

Appendix 2

	Preliminary Options	Description	Preliminary cost estimates for various overflow containment standard ($ millions) (+/- 50%)					
			6 months ARI	1 Year ARI	2 Year ARI	5 year ARI	10 year ARI	20 year ARI
1.	Complete Storage	Construction of storage tanks at a number of locations in the wider network.	23	37	62	83	129	305
2.	Complete conveyance	Enhance the capacity of the interceptor sewer, bringing the majority of wet weather flows (except extreme events) to Moa Point for treatment and discharge through the long outfall. • Would require augmentation of Moa Point Plant	116	130	143	155	166	199
3.	Complete overflow treatment	Construct combined small storage and treatment facilities at various locations in the network to treat overflows before discharge to receiving waters.	12	15	17	19	21	24
4.	Combined overflow treatment at Murphy St and downstream storage	Construct small storage tank and overflow treatment facility at Murphy St and downstream storage tanks to reduce peak flows reaching Moa Point.	17	22	32	35	45	54
5.	Combined overflow storage at Murphy St and downstream conveyance	Construct a large storage tank at Murphy St and enhance capacity of the interceptor sewer downstream to Moa Point. • Would require augmentation of Moa Pt Plant	77	93	110	127	150	252
6.	Combined overflow storage and downstream overflow treatment	Construct a large storage tank at Murphy St and other small storages and overflow treatment facilities at Moa Pt in addition to other locations upstream of Moa Point.	28	39	54	67	87	183
7.	Inflow and Infiltration (I/I) reduction programme	Implement a long term network rehabilitation programme to reduce I/I levels in the wider network.	o It is not known at this stage what overflow containment standard this option can achieve. o Estimate cost - $100 million over 20 years ($5 million per annum)					
8.	Continuing the Status Quo	Proposes no change to the current approach to the operation of Moa Point treatment plant, the bypass events and overflows in the wider network.	o No additional improvement costs o Carry on with annual renewal of the wastewater network of approximately $6 to $7 million per annum (replacing 1% of the network per year)					