

AND

IN THE MATTER OF

of a S128 review of Conditions 6 to 11
Inclusive of resource consent RC101727
to discharge water from Lake Waikare for
lake level control held by Waikato
Regional Council, Integrated Catchment
Management Directorate.

REPORT OF THE WAIKATO REGIONAL COUNCIL HEARING COMMITTEE

1 THE HEARING

In terms of the Waikato Regional Council's *Hearings Appointment Subcommittee decision* of 30 October 2014, a Hearing Committee comprising Dr Ian Boothroyd, Mr Fraser Campbell and Ms Dayle Hunia participated in a hearing at *Te Kauwhata* on *11th to 15th May 2015* and again on *19th May 2015* for the purpose of enquiring into the consent conditions review and the submissions thereto.

The decisions recorded within this report, which contain the findings of the Commissioners' deliberations on the review of consent conditions 6, 7, 8, 9, 10 and 11 of resource consent 101727, have been prepared in accordance with section 128 of the Resource Management Act 1991 (RMA). The decision covers the matters that were addressed in evidence presented at the hearing as well as technical discussions contained in the s128 consent review documentation and the section 42A report. We note that in response to questions by the Commissioners, further explanation, changes and technical advice were presented during the course of the hearing. This information, along with the respective modifications to recommended consent

conditions, is referenced in this decision as is necessary, to explain our findings and our overall decision.

An independent site visit was undertaken by the Commissioners on 11th May 2015. We were guided on our site visit by Dr H Robertson and Mr G Russell (aerial tour) and by the Hearing Secretary Mr S Rice (ground-tour), in both cases with the agreement of Counsel from all parties.

The hearing was formally closed at 5 pm on Friday 10 July 2015.

2 THE RESOURCE CONSENT REVIEW

Condition 14 of resource consent 101727 provides that notice of a review may be served on the consent holder during the month of August starting in 2003 and thereafter at 5 yearly intervals. In August 2013, the Waikato Regional Council, through delegated staff, made a decision to review conditions 6-11 of resource consent 101727. That decision is contained in document 2816445. The rationale for the decision to review is set out in that document.

Notice of the decision to review was served on ICM on 30 August 2013 (document 2823913). That notice invited ICM to propose new conditions. ICM accepted this invitation and new conditions were proposed in the document:

- Lake Waikare Resource Consent No. 101727 s.128 Review; RCS Supporting Document". Waikato Regional Council Internal Series 2014/06. (recorded as WRC document 3052284).

Legal framework of a review

Reviews of resource consents are conducted under sections 128-132 of the Act. Sections 128 and 131 in particular, provide some guiding principles for carrying out a review.

A key provision is section 131(1)(a) which states that the consent authority must have regard to whether the activity allowed by the consent will remain viable after the review. This consideration is relevant and establishes that the review cannot remove the benefit of the consent so as to render it unviable for the purpose for which it was granted, in this case, the discharge of water from Lake Waikare for lake level control. Furthermore, any changes arising from the review should not result in the consent holder being unable to comply with conditions that are not subject to the review or conditions on other related consents.

3 SUBMISSIONS

Within the prescribed submission period/s a total of six *submissions* were lodged with Waikato Regional Council from:

- The Director-General of Conservation (DoC)
- Fish and Game New Zealand, Auckland/ Waikato region
- Mr MJ Lumsden
- Ngaa Muka Development Trust
- Waahi Whaanui Trust
- ER Williamson on behalf of Eastern Whangamarino Restoration

4 APPEARANCES

Consent holder

The consent holder was represented at the hearing by Mr PM Lang and Mr G Ridley with six witnesses namely Messrs AJ Munro, MD Davis, MS Pennington, PR Cochrane, KC Giberson Jnr. and Dr M Baber.

Submitters

The Department of Conservation was represented at the hearing by Mr D van Mierlo and Dr H Robertson with twelve witnesses namely, Dr P Gerbeaux, Ms P Reeves, Dr B Clarkson, Dr D Campbell, Dr C O'Donnell, Ms M Sands, Ms S Dean, Dr M Gibbs, Mr B Fountain, Dr D Marsh , Ms Y Legarth and Dr L Barea.

Fish and Game were represented at the hearing by Ms S Ongley with two witnesses namely Mr D Klee and Ms C Jordan.

Mr Lumsden represented himself at the hearing with two witnesses being Mr MJ Cotman and Mr P Buckley.

Nga Muka Development Trust was represented by Mr A Hopkins.

Eastern Whangamarino Restoration was represented by Mr E Williamson.

Waikato Regional Council

Waikato Regional Council was represented by Ms D Palmer with one witness Mr G Levy.

5 CONSENT HOLDER'S PROPOSAL

Resource consent 101727 is one of a suite of resource consents that authorise the Integrated Catchment Management (ICM) Directorate of the Waikato Regional Council to operate the Lower Waikato Waipa Flood Control Scheme (LWWFCS). The LWWFCS was designed in 1959 and constructed in 1961-62. Originally authorised under the Soil Conservation and Rivers Control Act, in 1998 applications were prepared under the RMA and lodged with the Waikato Regional Council as the consent authority. The resource consent conditions were appealed to the Environmental and High Courts and were settled by consent order in 2002.

Condition 14 of resource consent 101727 provides for a notice of review to be served on the consent holder during the month of August commencing in 2003 and thereafter at five yearly intervals. In August 2013 the Council, through delegated staff, made a decision to enact Condition 14 to review conditions 6 to 11 of resource consent 101727. The reason for the decision to review is set out in a memo dated 30 August 2013 entitled Report and Recommendation on whether to initiate a s128 review of the WRC Lower Waikato/Waipā Control Scheme Resource Consent 101727

In response, the consent holder forwarded a revised suite of resource consent conditions that provided for the identifications of options, option analysis, a monitoring plan, monitoring plan review and offset mitigation.

6 MEDIATION

The Commissioners directed that mediation occur with a view to resolving and agreeing on a set of resource consent conditions to replace or to be in addition to conditions 6 to 11 of resource consent 101727. Accordingly mediation took place on Monday 8 December and Tuesday 9 December 2014. It is noted that parties reserved their positions with respect to the scope of review of conditions 6 to 11 but agreed to mediate in relation to conditions 6 to 11 only on a without prejudice basis. The list of attendees and the outcomes of the mediation were made available to the Commissioners in a Mediation Report authored by an independent mediator. Although the participants at the mediation reached agreement on a number of high level matters, agreement was not reached on a process for review of conditions 6 to 11 of resource consent 101727; nor was an agreement reached on a set of conditions to replace conditions 6 to 11 of resource consent 101727.

7 PROCEDURAL MATTERS

7.1 Scope of Review

Background

An issue of scope of the review was raised prior to, and during the mediation (Monday 8 December and Tuesday 9 December 2014).

We invited Counsel for each party to submit their position on scope of the S128 review but refrained from determining any preliminary finding on this matter, preferring for the hearing to take its course. As a matter of record, Mr Lang, Mr van Mierlo, and Ms Ongley presented submissions on scope on behalf of their respective representation on Tuesday 12 May.

The Commissioners also engaged independent legal Counsel to advise on the matter of scope. Accordingly, Mr Milne provided a verbal legal opinion on scope on Tuesday 12 May, and with the leave of Counsel for other parties, presented a written submission on Tuesday 19 May.

We record our finding on scope of the review here.

Statutory Provisions Considered

There was agreement between all parties that the review process is governed by sections 128 to 133 of the RMA. Sections 128 and 131 in particular provide the basis of when to undertake a review and the matters to be considered in that review. All Counsel agreed that the powers under a review are very extensive but that under s131(1)(a) the review will have regard to the continued viability of the activity authorised by the consent.

Issues in contention

The key issues of scope of the review are:

1. What reliance should be placed on the Notice to Review and supporting documentation to set the parameters of review (cf. scope);
2. The restriction of the review to sediment and sediment-based effects only or whether the review extends to non-sediment-based effects (in this case such as dissolved phosphorus, dispersal of weeds) (cf. scope); and

3. Whether the scope of review constrains the ability to impose process-related conditions.

In addressing the question of reliance on wording and documentation, Mr van Mierlo and Ms Ongley took the view that it is the Notice of Review under S129 and the wording therein that informs the consent holder (and commissioners) of both the review and the parameters of review. Mr van Mierlo and Ms Ongley both submitted that there is no requirement for a decision report or even a formal decision to review and that the first document for reliance would be a Notice of Review. Mr Milne advised the commissioners in his submission that this is correct, but not what actually occurred and referred to the Decision Report and the public notification; both going beyond the requirements of the s128 review.

We gave some prominence to the words of Mr Burrows as cited by Mr Milne: 'An inappropriate use of words by the drafter should not stand in the way of a sensible outcome if the intent of the underlying words is nevertheless clear'. We are of the view that throughout the Decision report, the Notice of Review and the public notification there was always the intention that the review referred to conditions 6,7,8,9,10 and 11 of consent 101727; and that there was never an intention that the review was of all conditions of the same consent. We accept the reasoned argument that Mr Milne provides in the use and intent of words that are included and/or excluded from the Decision report, Notice of Review and public notification. We view this as a sensible reasoned approach to the review. In this we find ourselves in agreement with Mr Lang and Mr Milne and conclude that the scope of the review is limited to conditions 6, 7, 8, 9, 10 and 11 of resource consent 101727.

The commissioners are also satisfied that throughout the Decision report, the Notice of Review and the public notification, that reference is made only to the adverse effects of sedimentation (and not adverse effect of any parameters associated with the activities authorised by consent 101727).

We agree with Mr van Mierlo that the scope of the review requires that the scope of any new conditions imposed under this review must be conditions that more effectively avoid or mitigate the adverse effects of the activities provided for by resource consent 101727. We found that the decision report, Notice of Review and public notification, were clear in their scope to assess the adequacy of the conditions in avoiding or mitigating adverse effects on the Pungarehu Stream, mineralised wetland, the Whangamarino wetland and the Whangamarino River. We note that, as Mr van Mierlo has recorded, that at the mediation all parties acknowledged that the changes to consent 101727 as a result of the review must be more effective than existing conditions.

We record here, that during the course of the hearing, the scope of the issues to be addressed were being progressively reduced. This was evident from the submission of revised sets of proposed resource consent conditions, designed to replace conditions 6 to 11 of RC 101727 by ICM and particularly DoC, which removed references to parameters that may be associated (e.g., nutrients bound to sediments, weed dispersal) with the activities related to sedimentation or the operation of the NCOG. We acknowledge that these revisions of proposed consent conditions were made without prejudice to our ruling on the scope of the hearing. Nonetheless, it means that matters such as nutrients associated with sediments and weed intrusions were removed from consideration for the resource consents and are not discussed further in our decision report.

7.2 Directions

We issued one verbal request and one minute during the course of the hearing:

Request 1 was delivered verbally during the hearing seeking clarification and agreement between ICM and DoC regarding the spatial extent and nomenclature of the vegetation and habitat types referred to within the Whangamarino wetland. This was considered helpful by the Commissioners to contribute to our understanding of the Whangamarino wetland and to ensure consistency of nomenclature in our decision document. An agreed map outlining the spatial extent and wetland types was received by the Commissioners on 3 June 2015.

Minute 1 was delivered to all parties via the Hearing Secretary on 17 June 2015. The minute sought clarification of the working calculations carried out by Mr Levy in Table 1 of his Attachment 3 to his view of resource consent 101727 (Lake Waikare)-Sedimentation -Supplementary comments dated 18 May 2015. This was considered helpful by the Commissioners to contribute to our understanding of the likely outcome of potential resource consent conditions requiring targets for sediment control of discharge from the Lake Waikare Outlet Gate so as to reduce sediment deposition in the wetland. A response was received on 18 June 2015 showing the working calculations and notes on any assumptions that Mr Levy had made in the course of his estimates. The Commissioners are satisfied that the response provided only clarification and did not provide any additional evidence.

7.3 Hearing procedures

Our Hearing Directions were advised on 9 April 2015. We repeat the relevant sections here:

- Pursuant to our advisory of 13 March 2015, any person who has made submissions and who is intending to call expert evidence must provide briefs for circulation no later than 5 working days prior to the hearing (1 May 2015). Note this pre-circulation does not apply to submitter statements to be made to the hearing by those submitters who have local and/or personal experience but not technical expertise. In this latter case they may present their evidence, written or verbal, in the normal way at the Hearing.
- Pursuant to our advisory of 13 March 2015, any rebuttal evidence by the consent holder be provided for circulation no later than 7 May.
- Under s41c we advise that all pre-circulated evidence will be taken as read at the Hearing. However, if an expert presenting evidence on any of the above matters has included in their evidence an executive summary or overall conclusion then if the expert so desires that summary or conclusion may be read aloud to the Hearing.

As there had been a large amount of evidence pre-circulated, at the commencement of the hearing, the commissioners also advised that there would be no questions of clarification or cross-examination permitted between parties and any specific questions were to be addressed in writing to the Hearing Chair. We record here that almost all witnesses provided oral and visual summaries of their respective statements of evidence.

7.4 Closure of hearing

The hearing was formally closed at 5 pm on Friday 10 July 2015.

8 EVIDENCE PRESENTED

Material was received from the various parties. The evidence of the consent holder and submitters pre-circulated. We have read and considered the information relevant to the review and evidence of the consent holder, the submissions and evidence of the submitters, and the section 42A Report that was pre-circulated to all parties. A summary of the evidence from submitters follows.

8.1 Consent holder

Mr Graeme Ridley introduced the case for the consent holder and provided a context for the resource consent conditions proposed by the consent holder.

Mr Adam Munro presented evidence as a qualified and experienced natural hazards scientist on the high flow and flood management arrangements for the lower Waikato River including its background, the operation of the control gates and the background to sedimentation. It became apparent in the course of Mr Munro's presentation that there was some uncertainty regarding certain aspects of the operation of the LWWFCS. Mr Munro provided supplementary evidence in response to specific questions from Commissioners that were unable to be answered verbally. Mr Munro was able to confirm that Te Onetea Stream, flows in one direction (that from the Waikato River into Lake Waikare) all of the time. He was also able to confirm that monitoring of total suspended solids (TSS) from the Te Onetea Stream suggests that water from the Waikato River has low TSS and has a dilution effect on the TSS levels in Lake Waikare. Mr Munro also confirmed his opinion that the Whangamarino weir is a controlling factor on sediment deposition in the southern area of the wetland.

Mr Matthew Davis presented evidence as a qualified and experienced civil engineer and as the Manager of the Central Waikato, Lower Waikato, Waipa and West Coast Catchments of the Waikato Regional Council. His evidence provided an overview of the five strategic directions of the WRC, and introduced the Lake Waikare and Whangamarino Wetland Catchment Management Plan (CMP) and the WRC's Healthy Rivers Regional Plan Change. In response to questioning from Commissioners, Mr Davis confirmed that WRC intends to fast-track components of the CMP, including the appointment of a new Catchment Management Officer to implement the Plan, and a reallocation of some \$40,000 for the Whangamarino Wetland. In response to further questioning, Mr Davis confirmed that the reallocated funds have not been allocated to respond to sedimentation issues. Mr Davis also emphasised the timing of implementation of catchment remedial measures will mean some potential further degradation of the wetland in the medium term.

Mr Kenneth Giberson Jr. presented evidence as a qualified and experienced water resources engineer on the hydrology and surface water levels of Lake Waikare and the Whangamarino Wetland and introduced the many factors that contribute to the complexity of the hydrology. Mr Giberson Jr. also supported the catchment management plan approach outlined by Mr Davis.

Mr Mark Pennington presented evidence as a qualified and experienced water resources engineer in the fields of hydraulics and hydrology, on the hydraulic characteristics and performance of the Whangamarino Wetland. He emphasised that when the Southern bog has been inundated and water levels have risen rapidly, there occurs a significant backflow in the Pungarehu Stream. Mr Pennington confirmed that this upstream flow is driven by water as a result of the presence of the Whangamarino River.

Mr Peter Cochrane presented evidence as a qualified and experienced environmental scientist on sediment characteristics and processes resulting from the operation of the NCOG and sediment loadings to the Whangamarino Wetland; and tabled the PDP report 'Suspended Solids Investigations in and around Lake Waikare and the Whangamarino Wetland (PDP 2015). Mr Cochrane confirmed that the rate of deposition varies within these waterways and on the flood plain, and also confirmed that the Whangamarino River upstream of its confluence with the Pungarehu Stream, is a source of sediment to the wetland. When questioned, Mr Cochrane confirmed that he supports the setting of quantitative limits in principle, but acknowledged the difficulty in ascertaining these limits with the information available. Furthermore, Mr Cochrane made it clear that any confirmation of compliance with a quantitative target for sediment deposition, could only be confirmed after the event and would require a suite of measures to implement to ensure compliance. In his rebuttal evidence, Mr Cochrane responded to **Dr Gibbs** and confirmed that the flow of water through the NCOG is a function of three factors; the height the gate is open, the tail water level and the water level in Lake Waikare.

Dr Matt Baber presented evidence as a qualified and experienced ecologist on the effects of sediment and bound nutrient deposition within the Whangamarino Wetland that is a direct result of the NCOG. In his presentation, Dr Baber focused on matters of difference between experts; assessment of vegetation changes and proposed conditions of consent. Dr Baber confirmed that there would be a continuation of irreversible effects from sediment deposition over the next two to three years until measures proposed by the consent holder were implemented. Dr Baber disputed the interpretation of the changes in vegetation in the evidence of **Ms Reeves** for DoC. In particular, Dr Baber considers that there has been change in vegetation post 2002 (essentially post-construction of the Whangamarino Weir) with an increased rate of decline of native vegetation in the northern and central bogs and negligible in the southern and Raeo bogs. Dr Baber confirmed his view that many factors contribute to decline in vegetation of the wetland, including sediment and nutrient intrusion from the Whangamarino River and Lake Waikare via the NCOG, altered hydrological characteristics, and the invasion of exotic species. Dr Baber referred to the proposed DoC quantitative limits as 'fuzzy targets' and preferred the resource consent conditions proposed by ICM.

Mr Graeme Ridley returned to his overview evidence, after the case for the consent holder was presented by the various experts above. He addressed the proposed ICM resource consent conditions to replace those under review.

8.2 Submitters

On behalf of DoC

Dr Hugh Robertson provided an overview of DoC's submission as a qualified and experienced wetland ecologist employed by the Department of Conservation as a Science Advisor (Freshwater). Dr Robertson was clearly familiar with the DoC submission, his knowledge and involvement of great value to the hearing. Dr Robertson provided an overview of the submission from DoC and introduced the issues that DoC sought to address. Large parts of Dr Robertson's evidence covered matters that were later removed from the content of revised proposed consent conditions submitted by DoC.

Dr Phillippe Gerbeaux presented evidence as a qualified and experienced wetland ecologist in his capacity as a Senior Technical Advisor employed by Department of Conservation on the significance of the Whangamarino Wetland, the key functional differences between the wetland types and ecosystem services.

Ms Paula Reeves presented evidence as a qualified and experienced wetland plant ecologist, on the botanical values of the Whangamarino Wetland and changes in the vegetation composition of the different wetland classes, especially between 1965 and the present. Ms Reeves confirmed the terminology to describe the various vegetation types within the wetland. In response to questions, Ms Reeves confirmed that limiting the water level to at, or below, 4.0 m RL at the Ropeway Water level Recording Station, would prevent water intrusions to the more sensitive parts of the Southern bog and avoid sedimentation there. Ms Reeves argued that although the peat bogs are significant and sensitive environments, the marshes and edges of swamps (mineralised swamps) and fens (semi-mineralised swamps) are equally significant as they are zones used most extensively by various bird communities. Ms Reeves pointed out, that in his evidence, Dr Baber had used a different base map to herself and clarified her opinion of the changes that have occurred to the vegetation of the wetland.

Dr Bev Clarkson presented evidence as a qualified and experienced plant ecologist on the ecological functioning of Whangamarino Wetland and the likely impacts of the operation of the NCOG under consent 101727 on the successional development of the wetland ecosystem. Dr Clarkson described the stages of the development sequence to raised bogs, which was particularly helpful in understanding the different types and locations of wetland types. Dr Clarkson described how the wetland is classified into a succession of four types: bog, fen, marsh and swamp. Each type has its own characteristics and associated flora and Dr Clarkson pointed out that each has a varying degree of susceptibility to inundation and sediment deposition. Dr Clarkson was clear in her response to questioning that the two factors of water level fluctuations and nutrient inputs are intertwined and highly influential on the succession and sustainability of bogs. In response to questioning, Dr Clarkson gave her opinion that while background modelling was still being developed, the establishment of quantitative targets limiting sediment intrusion into the wetland was a 'good start' to improving the sustainability of the wetland. Furthermore, Dr Clarkson was clear in her opinion that the targets put forward by Dr Robertson in his evidence were in the 'right ballpark' for the reduction and avoidance of environmental disturbance that negatively affect the long-term sustainability of the bog and fen types. Dr Clarkson provided evidence that the implementation of a water level restriction of 4.0 m RL (recorded at the Ropeway Water Level Recorder) would minimise inputs of sediments (and nutrients) and avoid cumulative effects to the composition and function of the bog and fen ecosystems.

Dr Dave Campbell presented evidence as a qualified and experienced ecohydrologist on the degree that the discharge from Lake Waikare is having on the ecohydrology of the Whangamarino Wetland. Dr Campbell explained that the emphasis on water level management was to prevent sediment-laden water entering into sensitive parts of wetland and that this was the rationale behind the DoC proposed consent condition to close the NCOG when water level reached 4 m RL (at Ropeway Water Level Recorder).

Dr Colin O'Connell presented evidence as a qualified and experienced wetland bird specialist on the adverse effects of the operation of the NCOG on wetland birds in the Whangamarino Wetland. In his evidence Dr O'Connell described the significance of the wetland habitats for wetland birds, but went on to acknowledge that the potential effects of sedimentation (or increased nutrient) have not been comprehensively investigated.

Ms Michelle Sands presented evidence as a qualified and experienced environmental scientist and modeller on the influence of the discharge from Lake Waikare via the NCOG on water levels and sediment quality within the

Whangamarino Wetland. Ms Sands was of the view that the use of management tools such as constructed and/or floating wetlands could reduce sediment (and nutrient) loads by up to 20% (TSS concentration) by 2027. Modelling by Ms Sands also suggests that catchment management measures (such as retiring steep land and fencing streams) could reduce sediment load by as much as 19-35% entering Lake Waikare from the Matahuru River. Ms Sands was also firm in her view that establishing maximum water levels at 4 m RL at Ropeway Water level Recorder whenever possible (i.e., except when required to meet the operating requirements of the NCOG as specified in condition 5 of consent 101725), then approximately 6% of the annual sediment load could be prevented from being discharged. Ms Sands confirmed her view that and new proposed consent conditions should include quantitative performance standards.

Ms Shay Dean presented evidence in her capacity as a Conservation Services Range – Biodiversity for the Department of Conservation. Ms Dean was able to clarify a number of matters regarding the structure and function of the Whangamarino Weir which was helpful to our understanding of its operation. Ms Dean also stated that it was always anticipated that the water levels in the Pungarehu Channel would be higher as a result of the construction of the Whangamarino Weir and thus the influence of the weir was known. Ms Dean also commented on consultation between ICM and DoC with respect to the timing of discharge from the NCOG.

Dr Max Gibbs presented evidence as a qualified and experienced aquatic chemist on the causes, rates and sources of sedimentation in the Whangamarino Wetland. Dr Gibbs confirmed that as much as 83% of the suspended sediment entering the wetland in a single event was sourced via the NCOG and Pungarehu Canal (cf. 30-35% as annual means) and the proportion of sediment from Lake Waikare relative to other sources is proportional to flow through the canal. In his rebuttal evidence, Dr Gibbs was also clear in his view that as the NCOG gate is opened, the initial bed scour effect decreases and that the proportional contribution from Lake Waikare will increase at medium and high flows.

Mr Ben Fountain presented evidence as a qualified and experienced engineer on the feasibility of a constructed wetland treatment device that could treat outflows from Lake Waikare and an assessment of the potential flooding effects of altering the operational controls of the NCOG. Mr Fountain presented the results of modelling two scenarios for closing the NCOG during high water levels and advised that under scenario B, the effect of implementing this regime on flood risk is negligible and would have little overall impact on the performance of the LWWFCS. In response to questions, Mr Fountain confirmed that he supports the DoC proposed condition that would see the NCOG closed when water levels reached 4 m RL at Ropeway Water Level Recorder, and that the aim of this condition was to reduce the discharge from Lake Waikare when water levels were high in the wetland. Mr Fountain also presented evidence that since 2004, the lake level has been maintained at the lower end of the consented range that is permitted.

Dr Dan Marsh presented evidence as a qualified and experienced agricultural economist on the value of ecosystem services provide by the Whangamarino Wetland under current and proposed DoC consent conditions. Dr Marsh concluded that in his opinion continuation of the current consent conditions would lead to a downward trend in provision of “ecosystem services” in parts of the wetland, whereas the proposed DoC conditions would lead to improved ecosystem services.

Dr Laurence Barea presented evidence as a qualified and experienced ecologist and a Technical Advisor Ecology for Biodiversity Offsets with the Department of Conservation. His evidence covered the principles of biodiversity offsets and explained the provisions for offsetting in the proposed DoC consent conditions. In

response to questioning Dr Barea explained the consent conditions proposed by DoC in relation to compensation for those effects that have already occurred. Dr Barea was able to explain that the offset payment proposed by ICM was in fact compensation.

Ms Yvonne Legarth presented evidence as a qualified and experienced planner on the planning analysis of the proposed conditions of the consent holder, the Council and DoC. Ms Legarth explained the various planning instruments including the Ramsar convention and the Vision and Strategy for the Waikato River.

Dr Hugh Robertson returned to his overview of the case for DoC following the presentations by the various experts above. He reconfirmed a number of key points and considered that multiple lines of evidence were available to provide evidence of adverse effects of the discharge resulting from the operation of the Lake Waikare NCOG. Dr Robertson outlined the approach from DoC that sought stepwise improvements in the management of consent 101727 with standards applied that take into account what is achievable.

Mr van Mierlo summed up the position for DoC in further submissions on behalf of the Director-General of the Department of Conservation. Notwithstanding comments on the ICM evidence Mr van Mierlo focused on what is not in dispute, and also acknowledged that we do not know the precise extent of distribution of the sediment discharged via the NCOG in the Whangamarino Wetland¹. In his oral submission Mr van Mierlo also acknowledged that this question may never be fully resolved and we may never know the full extent of sediment distribution. Nevertheless, Mr van Mierlo goes on to submit that there is compelling evidence to support the setting of clear, certain and enforceable performance standards and summarised the key elements of the draft conditions framework proposed by DoC.

On behalf of Nga Muka Development Trust

Mr Aareka Hopkins read a statement of evidence on behalf of **Nga Muka Development Trust**. He described the Moohiotanga Tuku iho knowledge concepts of old. He described the impacts of the operation of the NCOG on the Whangamarino Wetland and on Kaitiakitanga, on Mauri, on Waahi Tapu, on Mana Whakahaere and Manawhenua, and on Ngaa Taaonga Maaori Tuku Iho. He explained the significance of the loss of species within the wetland, and the effects of the changes in levels of Lake Waikare. Mr Hopkins also discussed the condition of Lake Waikare and drew the Commissioners attention to the algal bloom in the lake.

On behalf of Lumsden Farms

Mr Malcolm Lumsden presented evidence as a local landowner and Company Director of Lumsden Farms Limited. Mr Lumsden's evidence was helpful in terms of understanding the historical context of flooding within the Lower Waikato region and the introduction of the LWWFCS. Mr Lumsden pointed out that the present Waikato River flows are vastly different from the pre-LWWFCS. Mr Lumsden was strong in his opinion that the current lake operating levels should not be modified and supported the ICM approach of investigating a better understanding of sediment sources to the wetland and the contribution from Lake Waikare.

Mr Jim Cotman presented evidence as a local landowner in support of Mr Lumsden. Mr Cotman commented on the consequences of the construction of the

¹ Para 18, Further submissions on behalf of the Director General of Conservation, Mr van Mierlo

Whangamarino Weir and supported Mr Lumsden in his view that an investigation and a better understanding of sediment sources to the wetland and the contribution from Lake Waikare should be carried out.

Mr Peter Buckley presented evidence as a local landowner in support of Mr Lumsden. Mr Buckley also commented on his observations and the consequences of the construction of the Whangamarino Weir. Mr Buckley supported Mr Lumsden in his view that the Councils approach to investing in a wider Catchment Management Plan was sensible.

On behalf of Eastern Whangamarino Restoration

Mr Euan Williamson presented evidence for Eastern Whangamarino Restoration on the quality of the water discharged via the NCOG and what it means for the Whangamarino Wetland. Mr Williamson opposed the approach proposed by ICM and was concerned by the potential for continuing discharge of sediment-laden water into the wetland if the proposed approaches were unsuccessful. Mr Williamson proposed an alternative water level management and he considered a level of 4.0 m RL was more appropriately measured at the Falls Road gauging station.

On behalf of Fish and Game Council

Mr David Klee presented evidence as a qualified and experienced ecologist and in his capacity as a Game Bird Manager with the Auckland/Waikato Fish and Game Council. Mr Klee explained the Fish and Game Council's statutory obligations and the significance of the Whangamarino Wetland for game birds.

Ms Corina Jordan presented evidence as a qualified and experienced natural resource management planner in her capacity as the Environmental Manager for Fish and Game New Zealand, on the impacts of the current consent on the receiving environment and the analysis of relevant planning provisions. Ms Jordan commented on the respective consent conditions proposed by both ICM and DoC.

8.3 Waikato Regional Council Technical Report

The Waikato Regional Council was represented by **Ms Diane Palmer** who focused on the proposed conditions of consent that had been tabled during the course of the hearing. She re-emphasised that this is a review of specific consent conditions and that an important consideration is that LWWFCS remains viable after any amendment. Ms Palmer also emphasised that any conditions imposed need to relate to matters within the consent holder's ability to control. In this regard, she noted that the consent holder is not carrying out an industrial process that enables it to manage the quality of the discharge by altering its production. Thus the quality of the water that arrives in the Lake is beyond the consent holder's control. Ms Palmer also re-emphasised that there are operational constraints on the opening and closing of the NCOG. Ms Palmer also recommended specific terminology to be used in any proposed consent conditions and commented on the 'workability' of the consent conditions tabled by both ICM and DoC.

Mr Graham Levy presented evidence as a qualified and experienced engineer on the influence of the NCOG on sediment deposition in the Whangamarino Wetland. He acknowledged that there is no question that the discharge of sediment from Lake Waikare is a significant contributor to the sedimentation that is occurring, particularly in the areas adjacent to the Pungarehu Stream, including the mineralised swamp. He

confirmed his view that it will be necessary to obtain more reliable data specifically targeted at documenting and understanding the mechanism that sedimentation occurs. Mr Levy re-cast the proposed DoC performance targets and suggested that the average across the marsh, is likely to require a greater than 60% reduction in deposition attributable to the NCOG discharge. He considers this unlikely to be achievable.

8.4 Applicant's Right of Reply

Mr Lang presented his submission in reply on behalf of the consent holder. His submission focused on three main issues, summary of the issues to be determined, summary of ICM's position, and evidence that supports the outcomes proposed by the consent holder. Mr Lang acknowledges that in essence, the approaches proposed by ICM and DoC are very similar in that both approaches involve the specification of either a quantitative control (DoC) or a quantitative outcome (ICM) that is to be the target of investigation and works (at least for the first five years)². Mr Lang emphasises a preference for a target rather than a compliance limit as a large number of factors are out of the control of ICM³. Mr Lang acknowledged the degree of arbitrary selection of the quantum of reduction in sediment concentration, but emphasised that a 5% reduction in sediment concentration as proposed by ICM has a real prospect of achievability. In his oral submission Mr Lang related this to the 'good start' as emphasised by several DoC witnesses. Mr Lang then focused on the potential for a further s128 review in 2023 as provided for in condition 14 of the current consent, if there is a failure to meet the target⁴. Mr Lang questions the claims from several DoC witnesses of the efficiency of sediment removal from devices suggested (e.g., floating wetlands) but does not dispute that these options warrant further consideration in any investigation of further options⁵. Mr Lang also disputes the benefits to sediment reduction of imposing a maximum water level requirement (Scenario B) at Ropeway Water Level Recorder⁶. Mr Lang closed with a comment on the conditions imposed in the current consent given the complexities revealed through this S128 review process. In his closing submission, Mr Lang emphasises that ICM has a strong commitment to advancing the state of technical knowledge and applying it to produce an effective reduction in sediment deposition and its effects, and states that there is no compelling case to impose a suite of compliance requirements.

9 EVALUATION OF THE PROPOSAL

9.1 The principal issues of agreement

Based on the mediation report, the evidence we have heard and the submissions received, we acknowledge the following key areas of agreement by all parties:

- a) The Whangamarino Wetland is nationally and internationally recognised under the Ramsar Convention for its natural heritage values.
- b) The LWWFCS represents infrastructure of national significance.
- c) The Whangamarino Wetland is being adversely affected by the deposition of sediment.

² Para 28, Submissions in reply, Mr Lang

³ Para31, Submissions in reply, Mr Lang

⁴ Section E(d), Submissions in reply, Mr Lang

⁵ Para66(b) Page 25, Submissions in reply, Mr Lang

⁶ Para 69, Page 29, Submissions in reply, Mr Lang

- d) The Lake Waikare discharge is contributing to sedimentation.
- e) That changes to conditions 6-11 of Consent 101727 should be more effective than existing conditions.

9.2 The principal Issues of contention

Section 113 of the Act directs us to consider the principal issues of contention. Based on the application documents, submissions, evidence presented at the hearing, our consideration of them, and not least the scope of the S128 review, we find that the key matters in contention are:

- a) The relative degree that the Lake Waikare discharge via the operation of the NCOG is contributing to sedimentation.
- b) The imposition of targets or limits to reduce the amount of sedimentation in the Whangamarino Wetland.
- c) The level of information that is required to inform future management decisions.
- d) The types of consent conditions that are able to be imposed.
- e) The establishment of maximum water levels in the Whangamarino wetland to avoid sedimentation in sensitive areas of the Whangamarino Wetland.

9.3 Statutory Provisions Considered

Section 104 Assessment

In considering the application, we are obliged, subject to Part 2, to have regard to those matters set out in sections 131 and 104 of the RMA, before exercising our overall judgement when reviewing the conditions of the resource consent.

S104(1)(a) any actual and potential effects on the environment.

The conditions proposed will assist in establishing an improved process for evidence based decision making about the management of the NCOG. Our analysis of the evidence shows that there is currently significant uncertainty about the nature and significance of effects occurring from the deposition of sediment discharged from the NCOG.

The monitoring regime and assessment of options proposed will greatly assist in enabling better decisions to be made as part of integrated catchment approaches that are being developed beyond this review process.

Despite the current uncertainties and lack of data we are of the view that the consent holder must be required to demonstrate a reduction in sedimentation through the operation of NCOG and avoid sedimentation in sensitive areas of the Whangamarino Wetland.

S104(1)(b) any relevant provisions of plans, regulations and policy statements

We are required to have regard to any relevant provisions of the statutory planning instruments set out in Section 104 (1)b. The relevant instruments are discussed below.

Vision and Strategy for the Waikato River

The Waikato River Authority's Vision and Strategy Document – Te Ture Whaimana was developed in accordance with the Waikato-Tainui Raupatu Claims (Waikato River) Settlement Act 2010. Te Ture Whaimana is the primary direction setting document for the Waikato River and takes priority over National Policy Statements as confirmed in case law⁷

Section 17(3) of the Act requires persons “carrying out functions or exercising powers” in relation to activities in the Waikato River, to have particular regard to the Vision and Strategy.

The vision for the Waikato River is:

Tooku awa koiora me oona pikonga he kura tangihia o te maataamuri

“The river of life, each curve more beautiful than the last”

Our vision is for a future where a healthy Waikato River sustains abundant life and prosperous communities who, in turn, are all responsible for restoring and protecting the health and wellbeing of the Waikato River, and all it embraces, for generations to come.

The Vision and Strategies document outlines Objectives and Strategies that emphasise restoration and protection of the health and well-being of the Waikato River and its tributaries and waterways as follows:

Objectives:

In order to realise the vision, the following objectives will be pursued:

- a) The restoration and protection of the health and wellbeing of the Waikato River.
- b) The restoration and protection of the relationship of Waikato-Tainui with the Waikato River, including their economic, social, cultural and spiritual relationships.
- c) The restoration and protection of the relationship of Waikato River iwi according to their tikanga and kawa with the Waikato River, including their economic, social, cultural and spiritual relationships.
- d) The restoration and protection of relationships of the Waikato Region's communities with the Waikato River, including their economic, social, cultural and spiritual relationships.
- e) The integrated, holistic and co-ordinated approach to management of the natural, physical, cultural and historic resources of the Waikato River.
- f) The adoption of a precautionary approach towards decisions that may result in significant adverse effects on the Waikato River and in particular those effects that threaten serious or irreversible damage to the Waikato River.
- g) The recognition and avoidance of adverse cumulative effects, and potential cumulative effects, of activities undertaken both on the Waikato River and within its catchments on the health and wellbeing of the Waikato River.
- h) The recognition that the Waikato River is degraded and should not be required to absorb further degradation as a result of human activities.
- i) The protection and enhancement of significant sites, fisheries, flora and fauna.
- j) The recognition that the strategic importance of the Waikato River to New Zealand's social, cultural, environmental and economic wellbeing requires the restoration and protection of health and wellbeing of the Waikato River.

⁷ Puke Coal Ltd V Waikato Regional Council [2014] NZEnvC 223.

- k) The restoration of the water quality within the Waikato River so that it is safe for people to swim in and take food from over its entire length.
- l) The promotion of improved access to the Waikato River to better enable sporting, recreational and cultural opportunities.
- m) The application to the above of both maatauranga Maaori and latest available scientific methods.

Strategies

To achieve the objectives, the following strategies will be followed:

1. Ensure that the highest level of recognition is given to the restoration and protection of the Waikato River.
2. Establish what the current health status of the Waikato River is by utilising maatauranga Maaori and latest available scientific methods.
3. Develop targets for improving the health and wellbeing of the Waikato River by utilising maatauranga Maaori and latest available scientific methods.
4. Develop and implement a programme of action to achieve the targets for improving the health and wellbeing of the Waikato River.
5. Develop and share local, national and international expertise, including indigenous expertise, on rivers and activities within their catchments that may be applied to the restoration and protection of the health and wellbeing of the Waikato River.
6. Recognise and protect waahi tapu and sites of significance to Waikato-Tainui and other river iwi (where they so decide) to promote their cultural, spiritual and historic relationship with the Waikato River.
7. Recognise and protect appropriate sites associated with the Waikato River that are of significance to the Waikato regional community.
8. Actively promote and foster public knowledge of the health and wellbeing of the Waikato River among all sectors of the Waikato regional community.
9. Encourage and foster a whole-of-river approach to the restoration and protection of the Waikato River, including the development, recognition and promotion of best practice methods for restoring and protecting the health and wellbeing of the Waikato River.
10. Establish new, and enhance existing, relationships between Waikato-Tainui, other Waikato River iwi (where they so decide) and stakeholders with an interest in advancing, restoring and protecting the health and wellbeing of the Waikato River.
11. Ensure that cumulative adverse effects on the Waikato River of activities are appropriately managed in statutory planning documents at the time of their review.
12. Ensure appropriate public access to the Waikato River while protecting and enhancing the health and wellbeing of the Waikato River.

We have concluded that while our powers are limited to the scope of the review, the conditions are consistent with Te Ture Whaimana as they seek to establish a process for monitoring and reporting that will reduce uncertainty around adverse effects and inform decision making for future options. The outcomes of these processes will contribute to the protection and restoration of the River and its tributaries within a reasonable period of time.

The National Policy Statement for Freshwater Management (NPSFM) 2001 & 2014 Waikato

The National Policy Statement for Freshwater Management 2014 (NPS-FM 2014) sets out the objectives and policies for freshwater management under the Resource Management Act 1991. While the NPSFM provides guidance for regional plan documents, there are a number of provisions that are relevant to this review as outlined below:

Objective A1:

To safeguard:

- a) the life-supporting capacity, ecosystem processes and indigenous species including their associated ecosystems, of fresh water and*
- b) the health of people and communities, at least as affected by secondary contact with fresh water;*

in sustainably managing the use and development of land, and of discharges of contaminants.

Objective A2:

The overall quality of fresh water within a region is maintained or improved while:

- a) protecting the significant values of outstanding freshwater bodies;*
- b) protecting the significant values of wetlands; and*
- c) improving the quality of fresh water in water bodies that have been degraded by human activities to the point of being over-allocated.*

Objective B4:

To protect significant values of wetlands and of outstanding freshwater bodies

Objective D1:

To provide for the involvement of iwi and hapū, and to ensure that tāngata whenua values and interests are identified and reflected in the management of fresh water including associated ecosystems, and decision-making regarding freshwater planning.

The conditions set out a process to address effects that are already occurring. The development of future management options is considered consistent with the objectives of the NPSFW.

The involvement of iwi and hapū is provided for by inclusion in the consultative group as set out in the conditions. At a strategic level we note the active participation of Iwi and Hapū as part of the Healthy Rivers Plan Change and the ongoing framework set out in relevant settlement legislation that established the River Iwi Forum.

Waikato Regional Policy Statement (WRPS)

The policies of the operative Regional Policy Statement and the proposed Regional Policy Statement relevant to this application have been considered including matters relating to maintenance or enhancement of the environment through objectives 3.3,

3.7, 3.15 and 3.21 and the recognition of the values and relationship tangata whenua have with water bodies under 3.8. We note the provisions of Te Ture Whaimana are deemed in their entirety to form part of the WRPS as previously discussed.

We are satisfied that the conditions are consistent with the provisions of the WRPS.

Waikato Regional Plan (WRP)

The purpose of the WRP is to give effect to the RPS. We consider that the conditions are not inconsistent with the WRP and note that future alternative options requiring resource consent will be considered as part of a separate consenting process.

S104(1)(c) any other matter considered relevant

Waikato-Tainui Environmental Plan (WTEP)

The WTEP is an Iwi management plan and is considered relevant to this review. The purpose of the plan is to “to provide a map or pathway that will return the Waikato-Tainui rohe to the modern day equivalent of the environmental state that it was in when Kiingi Taawhiao composed his maimai aroha” (section 1.3). The significance of wetlands is described in chapter 20 and Objective 20.3.1 states that “existing wetlands are protected and enhanced”.

The WTEP states that a precautionary approach is encouraged with respect to consent terms. It also noted (page 61) that Waikato-Tainui understands that the biggest improvements in consent conditions are through consent renewals and not consent reviews.

We are of the view that the conditions are consistent with the WTEP as they will result in improved understanding about the effects of the NCOG and may be subject to review in five years' time.

Part 2 of the Resource Management Act 1991 – Purpose and Principles

The Section 104 assessment is subject to Part 2, Purpose and Principles of the RMA:

Section 5: Purpose

- (1) The purpose of this Act is to promote the sustainable management of natural and physical resources.
- (2) In this Act, sustainable management means managing the use, development, and protection of natural and physical resources in a way, or at a rate, which enables people and communities to provide for their social, economic, and cultural well-being and for their health and safety while—
 - (a) sustaining the potential of natural and physical resources (excluding minerals) to meet the reasonably foreseeable needs of future generations; and
 - (b) safeguarding the life-supporting capacity of air, water, soil, and ecosystems; and
 - (c) avoiding, remedying, or mitigating any adverse effects of activities on the environment.

Section 6 Matters of National Importance

The relevant matters include (a) the preservation of the natural character of wetlands, and lakes and rivers and their margins, and the protection of them from inappropriate use, and development, (b) the protection of outstanding natural features and landscapes from inappropriate use, and development, (c) the protection of areas of significant indigenous vegetation and significant habitats of indigenous fauna and (e) the relationship of Maori and their culture and traditions with their ancestral lands, water, sites, waahi tapu, and other taonga.

Section 7 Other Matters

The relevant s.7 matters to have particular regard to are (a) kaitiakitanga: (aa) the ethic of stewardship: (b) the efficient use and development of natural and physical resources: (d) intrinsic values of ecosystems: (f) maintenance and enhancement of the quality of the environment (g) any finite characteristics of natural and physical resources:

Section 8

We are required to take into account the Principles of the Treaty of Waitangi.

9.4 Synopsis

In effect, we are required to make a broad overall judgement as to whether the conditions of review are consistent with the Purpose of the Act. We consider that this is the case and note particularly that:

- The conditions relate to a consent that broadly contributes to people and communities their health and safety by allowing the effective protection of land as part of the LWWFCS.
- The conditions will not compromise the reasonable needs of future generations.
- On balance, the proposed activities will not have significant adverse effects on the life supporting capacity of water or ecosystems and;
- Any adverse effects can be adequately mitigated through the revised conditions

In terms of Section 6 and 7, we are satisfied that the conditions are not inconsistent with these matters.

In our view the conditions are not inconsistent with the Principles of the Treaty of Waitangi and note that the conditions set out a process for participation in the consultative process with hapū submitters. Waikato-Tainui, as the Iwi Authority, were involved in the review process but did not submit.

We are of the view that at the very least, the outcome of this review should be that any adverse effects arising from the operation of the NCOG are better managed so as to achieve a reduction in sedimentation from what is currently occurring as well as improved monitoring and reporting regimes. This process will also lead to the identification of viable future management options.

Our ability to impose conditions are constrained by the following limitations:

- a) The scope of the review is limited to conditions 6-11 of the resource consent - RC101727. This consent is one of twelve related to the LWWFCS. The

- Committee in its deliberations must ensure that the operation of the scheme remains viable within the context of the amended consent conditions;
- b) The amended conditions must be limited to matters that are within the consent holders ability to control; and
 - c) The contribution of the effects of this consent to the overall sedimentation of Whangamarino Wetland relative to other causes and factors is unclear and requires further investigation as part of the consent monitoring regime outlined in the amended conditions.

Notwithstanding these limitations, we have carefully reviewed and refined the consent conditions and consider that they are consistent with the sustainable management purpose, and Sections 5, 6, 7 and 8, of the RMA.

10 REVIEW OF CONSENT CONDITION

10.1 Objectives

In presenting the revised conditions proposed by ICM, Mr Ridley introduced the concept of including 'objectives' for the purpose of clarifying what is intended from the consent conditions. Mr Ridley pointed to some substantial operations that have had such objectives included in resource consents. Mr Ridley pointed out that any 'objectives' would be by way of advice rather than consent conditions for action. We favour this approach and have included a modified suite of objectives that we expect to be included at the forefront of our revised consent conditions as follows:

Overall Sediment Deposition Management Objectives

- A. The consent holder acknowledges that Waikato-Tainui are recognised as the Treaty Partner with the Crown and are therefore regarded as having a specific role and function in relation to the management of the Waikato River which includes Lake Waikare and the Whangamarino Wetland as described in the Waikato-Tainui Raupatu Claims (Waikato River) Settlement Act 2010 and the subsequent Joint Management Agreement. The provisions of the Settlement, the Waikato River Vision and Strategy and the Waikato-Tainui Environmental Plan will be considered when assessing future options and solutions to address sediment deposition from the NOCG and Canal.
- B. The priority for reduction of sediment deposition shall be based on the Southern Wetland environment of the Whangamarino Wetland complex. Consideration will also be provided to the northern and central wetland environments.
- C. Within the Whangamarino Wetland complex wetland environments there shall be priority placed on the avoidance of effects and the protection and enhancement of the "wetland bog" environments followed in priority by the "wetland fen" environments.
- D. The consent holder shall progressively reduce sediment discharge through the Northern Outlet Control Gate in the short, medium and long term on a prioritised basis, including 'early interventions' as specified in conditions 24 to 27 below.
- E. The consent holder shall ensure that any actions and options implementation, associated with conditions 16 - 51, support and are integrated with catchment-wide initiatives and approach for the Lake Waikare and Whangamarino

catchments including the development of the Catchment Management Plan and the Healthy Rivers Plan Change.

10.2 Peer review

The sets of consent conditions submitted by ICM, DoC and Waikato Regional Council respectively, all proposed a peer review process for the purpose of providing independent advice to ICM over the likely success and suitability of any options proposed to reduce sedimentation in the Whangamarino Wetland. We had some disquiet with regard to the peer review processes put forward by all parties. For the most part we found them either overly complex or offering too much authority over the progress of the requirements of the consent.

Our disquiet on this matter was in part a function of terminology with peer review being seen as essentially an approval process versus an advisory group of technical experts. Accordingly, we have modified the terminology in our decision to better reflect our expectations of any independent advice or review. We propose a condition to establish a 'Peer Review Panel' to better reflect our expectations of the role of peer review of offering independent advice and guidance, and its establishment occurs only once for the course of the consent. We have included specific conditions to establish the panel and list the functions of the panel as being to:

"critically assess the relevant work, report or plan submitted by the consent holder for its review, and shall advise the consent holder in writing whether:

- a) the work, report or plan addresses all the matters required;
- b) the work, report or plan addresses all matters to an adequate standard; and
- c) any assessment, or methods or options to be implemented are supported by the technical analysis and available monitoring data."

We consider that there is unlikely to be a single individual who would have the complete technical expertise to act as a peer reviewer of the range of option outcomes and data analysis that we would anticipate from the proposed consent conditions. Accordingly, our expectation is that the Peer Review Panel will comprise of a number of individuals who between them comprise a panel that has recognised qualifications and experience in, but not limited to:

- a) Sediment transport and deposition processes;
- b) Hydrological and hydraulic analysis and monitoring;
- c) Water quality; and
- d) Wetland ecology.

Our expectation is that the same individuals would comprise the Peer Review Panel and would sit at least until the final approval of the option(s) selected to reduce sediment deposition in the Whangamarino Wetland by 2020 is made. Nevertheless we have added a condition of consent that would allow the appointment of an individual to replace a panel member who was no longer able or placed to act on the panel.

10.3 Extent of contribution of sediment from the operation of the NCOG

The Northern Outlet Control Gate (alternatively referred to as the Lake Waikare Gate) controls the discharge of water from Lake Waikare into the Pungarehu Canal. This

discharge then flows into the Pungarehu Stream and then combines with the Whangamarino River and exits to the Waikato River. The water carries with it varying loads of suspended sediment.

We heard a significant amount of evidence from experts including Drs Robertson, Clarkson, Campbell and Baber regarding the effects of the discharge of sediment-laden water from Lake Waikare on the Whangamarino Wetland. These effects relate to both the deposition of sediment on different parts of the wetland, some as a consequence of elevated water levels attributable to the discharge. We deal with water level below. The issue that sediment deposition is occurring within the Whangamarino Wetland is not disputed by the parties.

We understand that the discharge carries with it varying concentrations of suspended sediment some of which remains in suspension and is eventually discharged into the Waikato River. The balance of the suspended sediment is deposited on the bed of the canal, the stream, the river or the adjacent floodplain (including the mineralised swamp or marsh).

Evidence has been provided that the rate of deposition varies within these water ways and on the flood plain⁸. We have also been told by Mr Cochrane¹⁰ that the Whangamarino River upstream of its confluence with the Pungarehu Stream, is a source of sediment to the wetland. Evidence from Mr Pennington⁹ states there are periods when “significant backflow (or flow from the Whangamarino River into the Pungarehu Stream and the associated flood plain) was shown to occur”. From the evidence before us, we concluded that sediment deposition adjacent to the Pungarehu Stream is not solely attributable to the Lake Waikare discharge and this is confirmed by the analysis presented by Dr Gibbs. Various studies have been undertaken to try and quantify the source and the extent of the sedimentation in the mineralised swamp and in other areas of the wetland. The analysis of Dr Gibbs suggests that on average approximately one third of the deposited sediment within the mineralised swamp was derived from Lake Waikare via the operation of the NCOG; and that this can rise to as much as 83% contribution from the lake at times of high flood flows¹⁰.

We heard evidence from Dr Robertson that the consent conditions proposed by DoC would “control and reduce the direct impacts of consent 101727”¹¹. He recommended conditions around (a) sediment deposition in the wetland, (b) sediment (mass) load in the discharge, (d) total suspended sediment concentration in the discharge.

The sediment deposition standards (a) were based on an assessment of sediment deposition rates that occurred prior to the Waikare Gate discharge¹². Dr Robertson advised that prior to the Pungarehu Canal the percentage contribution of Lake Waikare to sediment build-up was essentially zero.

The proposal to reduce sediment loads (b) were based on what was seen as being “feasible and viable”¹³. Miss Sands stated¹⁴ that constructed wetlands and floating wetlands could reduce the sediment loads discharged from Lake Waikare. She referred to modelling by Jacobs which “indicates that a reduction of 20% of TSS by 2037 is a realistic water quality target for TSS (load and concentration)”.

⁸ Para 8, Statement of Evidence of Peter Cochrane

¹⁰ Table 3 Statement of Evidence of Peter Cochrane

⁹ Para 40 Statement of Evidence of Mr Mark Pennington

¹⁰ Para 4.44 Statement of Evidence Dr Max Gibbs

¹¹ Para 6.15 Second Statement of Evidence of Dr Hugh Robertson 29 April 2015

¹² Table 6, Sediment deposition - Basis for Standard, Second Statement of Evidence in Chief of Hugh Robertson, 29 April 2015

¹³ Table 6, Sediment Load - Basis for Standard, Second Statement of Evidence in Chief of Hugh Robertson, 29 April 2015

¹⁴ Para 10.9 Statement of Evidence of Ms Michelle Sands, 30 April 2014

The total suspended sediment concentration (d) was linked to the 30% reduction in sediment load sought and was seen as consistent with the “WRC standard for permitted activities”¹⁵. Mr Ridley tabled a set of proposed conditions¹⁶ that include one quantitative standard in condition 10 that provided for a target reduction in sediment concentration (TSS / NTU). In his statement of evidence¹⁷ he notes that that DOC provided a summary table that gave some explanation of how the proposed conditions were developed, but goes on to highlight how there is no specific data that relates to the performance standards proposed by DoC.

In Table 3.3 of his review of resource consent 101727 (Lake Waikare) sedimentation¹⁸ Mr Levy notes that with a sediment trap in the Lake or Canal “much of the suspended sediment would be too fine to be effectively removed in smaller basins or traps in the Lake of Canal”.

In his subsequent memorandum¹⁹ presented at the hearing, Mr Levy analyses the sedimentation standards proposed by DoC. In Attachment 3 of his memorandum Mr Levy concluded that based on his Table 1, the average reduction required in the deposition attributable to the Lake Waikare discharge, across the proposed wetland monitoring sites, is likely to be in excess of 60%. We were struck by the magnitude of these figures when re-cast in this manner. Mr Levy considers that these targets are unlikely to be achievable²⁰. We accepted verbal clarification from Dr Robertson on Mr Levy’s calculation of average reduction in sediment deposition. We acknowledge that Dr Robertson’s interpretation of the same calculation was less than that put forward by Mr Levy but was still a substantive figure. Earlier evidence from Ms Sands referred to sediment reduction rates of 20% were achievable²¹. Mr Levy questioned the analysis carried out by Ms Sands²², commenting on the limited use of data to provide accurate estimates of flows from the lake.

We have accepted this evidence and that of Mr Levy regarding the reduction in the level of sedimentation in the marsh area required as a consequence of DoC’s proposed condition 14 and conclude that the inclusion of limits regarding sediment deposition would be impractical and unlikely to be achievable. Several witnesses offered options for reducing the sediment load but further investigation would be required to ascertain the likelihood of success of any one of them. We are of the view that the reductions of sedimentation in the fen areas are also likely to be impractical given the proposed condition that limits the contribution to less than 5% compared with the marsh requirement of from <20% to <10%.

However, we were persuaded by the performance target proposed by the consent holder that a 5% reduction in sediment concentration discharge through the operation of the NCOG was achievable in the timeframe put forward (i.e., in year 2020). In response to questions, Mr Ridley made it clear that this was a performance target to be achieved in 2020 but nonetheless was to be maintained thereafter. We were persuaded by the evidence from DoC and Fish and Game, that any target should in fact be an enforceable limit.

¹⁵ Table 6, TSS Concentration - Basis for Standard, Second Statement of Evidence in Chief of Hugh Allister Robertson, 29 April 2015

¹⁶ Condition 5 ICM Resource Consent Conditions 101727 Proposed Conditions 19 May 2015

¹⁷ Para 60 Statement of Evidence Mr Graeme Ridley

¹⁸ Review of Resource Consent 101727(Lake Waikare) Sedimentation Beca Ltd 18 November 2014

¹⁹ Memorandum to Diane Palmer – Environment Waikato, Review of Resource Consent 101727(Lake Waikare) Sedimentation Supplementary comments Mr Graham Levy, Beca Ltd 18 May 2015.

²⁰ Page 11, Memorandum to Diane Palmer – Environment Waikato, Review of Resource Consent 101727(Lake Waikare) Sedimentation Supplementary comments Mr Graham Levy, Beca Ltd 18 May 2015.

²¹ Section 7 Statement of Evidence Ms Michelle Sands, 30 April 2015

²² Page 12, Memorandum to Diane Palmer – Environment Waikato, Review of Resource Consent 101727(Lake Waikare) Sedimentation Supplementary comments Mr Graham Levy, Beca Ltd 18 May 2015.

The terms of the S128 review requires that the consented operation remains viable, and there is no desire by any party to prevent the discharge from occurring within the legal requirements as set out in consent 101725. However, we held the view, which is consistent with the evidence presented by all parties, that although the discharge cannot be stopped, there can be continued efforts to keep working at reducing the impacts of its operation on the Whangamarino Wetland. We favoured the approach proposed by DoC of a stepwise reduction in sediment concentration occurring as a result of the operation of the NCOG. Accordingly, based on the balance of evidence before us, we consider that an additional limit requiring an overall 10% reduction in TSS/NTU concentrations by the year 2030 (or earlier) and maintained thereafter is appropriate and achievable. The interim period provides opportunity for the variety of catchment-wide initiatives to commence and herald some results, as well as appropriate actions to be implemented.

10.4 The establishment of maximum water levels in the Whangamarino wetland

The proposed DoC consent conditions include a condition that requires the closure of the NCOG when water levels reach 4.0 m RL at Ropeway Water Level Recorder. Dr Robertson concluded that the water level control was “based on the physical location of the sensitive wetland types (bog and fen) in the Whangamarino Wetland. The 4.0m RL (Ropeway) water level target was selected to limit inundation of peatlands (bogs/fens) with poor quality water from the Lake Waikare discharge”²³.

In her evidence, Dr Clarkson was clear that preventing the increase in water level above 4.0 m RL at Ropeway Water Level Recorder was extremely important for minimising impacts from sediments (and associated nutrients) on the sensitive bog and fen wetland types²⁴, a view also supported by Dr Campbell²⁵. Mr Hopkins also commented on the need to avoid or reduce adverse impacts of sediment-laden water on bogs and fens²⁶. We were persuaded by Mr Fountain whose evidence of the current operations of the NCOG and consequences of modelling of alternative scenarios was compelling in showing that closure of the gate at 4.0 m RL at Ropeway Water Level Recorder had negligible impact on flooding around Lake Waikare²⁷. This was further emphasised by his analysis of the actual operating range of the NCOG under the current conditions whereby the water level within Lake Waikare has been largely retained at the lower level of its consented operational range. Mr Fountain recommended the adoption of his Scenario B which also included the provision “except for the extent that the consent holder is legally required to open the NCOG under RC101725”, thus satisfying s131(1)(a) that the review will have regard to the continued viability of the activity authorised by the consent.

Furthermore, in her evidence, Ms Sands finds from her analysis that if the NCOG is closed when water levels are at 4.0 m RL (at Ropeway Water Level Recorder) whenever possible and still meeting the condition 5 of consent 101725 (i.e., within the required operating regime of the LWWFCS) then approximately 6% of the annual sediment load could be prevented from being discharged during this period²⁸. Mr Fountain acknowledges that the overall reduction in annual load appears minimal but it is the reduction of load when the wetland has high water levels that is significant for reducing the impact of sediment-laden water on the more sensitive ecological areas in the wetland.

²³ Table 6, Water level - Basis for Standard, Second Statement of Evidence of Dr Hugh Robertson, 29 April 2015

²⁴ Para 5.2 Statement of Evidence of Dr Beverley Clarkson, 22 April 2015

²⁵ Para 3.9 Statement of Evidence of Dr David Campbell, 21 April 2015

²⁶ Section 7 Statement of Evidence Mr Hopkins, 14 May 2015

²⁷ Paras 5.4 to 5.9 Statement of Evidence of Mr Ben Fountain,

²⁸ Para 3.17 Statement of Evidence of Ms Michelle Sands, 30 April 2015

In his evidence, Mr Giberson Jr. presented a preliminary assessment of implementing this proposed consent condition (choosing 2007 for his assessment) and as a result of his assessment concludes that ICM would not comply with the relevant LWWFCS consent conditions. Mr Giberson Jr. reaches the same conclusion for his analysis of 2008 data but we understood that the relevant provision of the proposed consent condition would enable ICM to meet operating consent requirements. Likewise, we accept the concerns expressed by Mr Munro that if the capacity and functionality of the NCOG were to be reduced or decommissioned entirely, this would have significant implications on high flow management²⁹. We do not accept however that including a requirement to close the NCOG when water levels reach 4 m RL at Ropeway Water Level Recorder (except if closing the NCOG would result in the Lake Waikare water levels exceeding the consented operating range) will reduce the capacity and functionality of the LWWFCS. Our view is that inclusion of this consent condition, neither reduces, nor decommissions the capacity or functionality of LWWFCS as provided for in respective resource consents.

We acknowledge the concerns expressed by Mr Lumsden regarding alterations to water levels but are confident that the legally consented operating regime of the NCOG as permitted will not change and the anticipated levels of flood storage and release will continue to be achieved under the LWWFCS. We anticipate that at these times flood storage within Lake Waikare may be at its upper operational limit as permitted under the resource consents. We accept the evidence of Dr Giberson Jr that adopting Scenario B would mean that the NCOG would need to be opened on occasions under this scenario to prevent exceedance of the Lake Waikare water levels³⁰. It is our understanding that this is anticipated by Mr Fountain as the level is not expected to be maintained where the legal requirements for the NCOG operation have to be met.

Mr Giberson Jr³¹ and Mr Pennington³² both suggested that from an ecological perspective it may be more appropriate to base the suggested NCOG operational restriction on water levels at the Falls Road Water Level Recorder rather than Ropeway Water Level Recorder (as this station would be more representative of water levels within the southern portion of the Whangamarino Wetland). This may indeed be the case, but we were not presented with any evidence of a relationship of water levels with the Falls Road site and the NCOG that was meaningful to the avoidance of effects sediment-laden water inundating the southern bog and fen. We encourage further investigation of this possibility as one of the future options for consideration.

We accepted the evidence of Mr Fountain, Ms Sands, Dr Clarkson and Dr Campbell and the recommendation of Dr Robertson to include a condition of consent that requires the NCOG be closed when water levels within the wetland reach 4.0 m RL as recorded at Ropeway Water Level Recorder, except to the extent that the consent holder is legally required to open the NCOG under RC101725. Our decision to include this as condition of consent satisfies Part 2 of the RMA to avoid inundation of sediment-laden water and to avoid impacts of sedimentation on the more sensitive bog areas, especially of the southern bog. The estimated 6% decrease in annual sediment load discharged to the Whangamarino Wetland from the operation of NCOG was also seen by the Commissioners as an equally valid 'immediate action' that could be implemented promptly³³.

²⁹ Para 16 of Statement of Evidence of Mr Adam Munro, undated

³⁰ Para 168 and 169, Statement of Evidence of Mr Kenneth Giberson Jr., 23 April 2015

³¹ Para 168f, Statement of Evidence of Mr Kenneth Giberson Jr., 23 April 2015

³² Para 66, Statement of Evidence of Mr Mark Pennington, undated

³³ Proposed Consent Condition 9-13 tabled by Mr Graeme Ridley, 19 May 2015

10.5 Investigations and monitoring

Investigations

While there seems little doubt that sedimentation is occurring within the mineralised swamp of the Whangamarino Wetland, and all parties agree that there is a case to answer, there is no clear or agreed method that can, with certainty, result in the reduction of sediment deposition. Miss Sands stated³⁴ that constructed wetlands and floating wetlands could reduce the sediment loads discharged from Lake Waikare. She referred to modelling by Jacobs which “indicates that a reduction of 20% of TSS by 2037 is a realistic water quality target for TSS (load and concentration)”. Mr Fountain pointed to the construction of artificial wetlands as a means of reducing the total solids entering Whangamarino Wetland from Lake Waikare by up to 21%³⁵. On the other hand, Mr Cochrane questions some of the aspects of the concepts put forward by Ms Sands and Mr Fountain and emphasises his reservations about proposing methods without a significant investigation and design effort to confirm whether any method (or combination of methods) to manage sediment loads represents the Best Practicable Option³⁶.

All parties are in agreement that further investigations are required to better refine the option(s) that would best meet the needs of reducing sediment deposition in the Whangamarino Wetland. We consider that the approach suggested by ICM is sufficiently robust with peer review requirements (with an established Peer Review Panel) and information sharing with stakeholders to best meet the needs of investigating options.

Monitoring

While there appears to be considerable data available, Mr Levy summarised the situation as “much of it is quite localised and the data for estimating sediment load is sparse and highly variable.”³⁷ He goes on to consider that it will be necessary to obtain more reliable data specifically targeted at documenting and understanding the mechanism by which the sedimentation occurs, and to test options for mitigation (both through field testing and through theoretical modelling specifically targeted at realistic solutions, based on the evidence), before measures can be confirmed and performance targets set. He considers that the modelling and options testing to date, by both the consent holder and DoC, are not sufficiently comprehensive or robust technically to permit conclusions on feasibility or outcomes to be drawn. This is a view shared by Mr Cochrane who supports the development of a programme to monitor the nature and extent of sediment deposition, the rate of deposition and the potential source of sediment, based on methods acceptable to the peer review (panel)³⁸.

We acknowledge that DoC in particular, have collated a substantial amount of new data, some of which has involved innovative new techniques. Despite the fact that some of these methods (i.e., CSSI³⁹) remain to be further developed we were convinced by the evidence of Dr Gibbs that this method offers the best known opportunity to quantify the source contribution of sediments depositing in the Whangamarino Wetland; and that over time offers a realistic method for ascertaining the overall success of objectives to reduce sediment deposition in the Whangamarino Wetland resulting from the operation of the NCOG.

³⁴ Para 10.9 Statement of Evidence of Ms Michelle Sands, 30 April 2014

³⁵ Section 4, Statement of Evidence of Mr Ben Fountain, 30 April 2015

³⁶ Paras 25-28, Rebuttal evidence of Mr Peter Cochrane, 23 April 2015

³⁷ Page 1, Memorandum to Diane Palmer – Environment Waikato, Review of Resource Consent 101727(Lake Waikare) Sedimentation Supplementary comments, Mr Graham Levy, Beca Ltd., 18 May 2015

³⁸ Para 117, Statement of evidence of Mr Peter Cochrane, 23 April 2015

³⁹ Statement of Evidence of Dr Max Gibbs, 29 April 2015

We are mindful of ensuring that any monitoring is relevant to the requirements of the consent and to provide for the avoidance, remedy or mitigation of adverse effects. We have therefore included consent conditions that require the following monitoring:

- Continues to measure whether and at what rate sediment deposition is continuing in the mineralised swamp of Whangamarino Wetland
- Measures the contribution of sediment deposition in the mineralised swamp of Whangamarino Wetland that is derived from Lake Waikare.
- Continuously measures the NTU of water discharged from Lake Waikare on a continuous basis.
- Measures total suspended sediment concentrations and volume of water discharging from Lake Waikare.
- Measures a suite of water quality parameters from Lake Waikare, the Matahuru Stream, and the Waikare Canal once every two months

In addition to the monitoring outlined above, the collection of additional data may be initiated as part of the options analysis.

11 DECISION

The revised consent conditions will assist in establishing an improved process for evidence based decision making about the management of the NCOG. Our analysis of the evidence is that there is little doubt that the NCOG is contributing to the deposition of sediment in the Whangamarino Wetland and that there is potential and actual adverse effects to arise from the continuation of consent 101727 with its current conditions. From the evidence presented to us and their proposed consent condition we came to the conclusion that a new and enlarged suite of consent conditions should replace conditions 6 to 11 of consent 101727 in their entirety.

We acknowledge that there are some uncertainties over the extent of influence of sediment deposited sediment that arises from the operation of the NCOG, and we have proposed conditions of consent that a) allow for continued monitoring of a suite of parameters that will continue to measure sediment deposition within the Whangamarino Wetland; and b) a process for specific investigations including as necessary any further monitoring, to clarify which option or options are best implemented to reduce the influence of the NCOG discharge on sediment deposition in the wetland.

Despite the current uncertainties we are of the view that the consent holder must be required to demonstrate a reduction in sedimentation through the operation of the NCOG. We have therefore established a limit of 5% reduction in sediment concentration, in mean annual TSS/NTU, of 5% to be achieved at or prior to 31 December 2020. We agreed with the stepwise approach put forward by DoC that would result in further reductions in sediment concentrations at a later date and we have added a consent condition to require further reductions in mean annual TSS/NTU over the following ten years (i.e. to 2030) and that these levels be maintained thereafter. From the evidence heard, we consider that these limits are achievable and we have allowed sufficient time for the necessary investigations to take place.

We also saw a need for some immediate actions and we were encouraged by the consent holder's willingness to include conditions that require some immediate responses, including investigations that are expected to occur within six months of this decision. We were persuaded by submitters that, except to the extent that the consent holder is legally required to open the NCOG under Resource Consent 101725, a maximum water level of 4 m RL recorded at Ropeway Water Level Recorder would be significant in avoiding adverse effects to the more sensitive bogs and fens of the Whangamarino Wetland.

We are satisfied that the proposed conditions under this S128 review provides for the continued viability of the LWWFCS and for sufficient time for necessary investigations and options to be implemented that will result in a measureable reduction in sediment deposition over time and will avoid adverse effects to the more sensitive areas of bog and fen of the Whangamarino Wetland.

We are confident that this S128 review of conditions 6 to 11 of resource consent 101727 is not contrary to any relevant plans or policies, and that the review is consistent with the purpose and principles of the Resource Management Act 1991

DATED this 3rd day of August 2015



Ian Boothroyd Chairperson



Fraser Campbell



Dayle Hunia

(if the decision is to grant the consent/s applied for then the full schedule of each consent granted including conditions to be detailed here)

SCHEDULE OF CONSENTS GRANTED

Resource Consent No. 101727

Resource Consent 101727 s128 Review Conditions

Please note that original conditions 1 to 5 and 12 to 15 remain as per current consent 101727. The conditions are included in the existing consent as conditions 16 onwards (with original conditions 6-11 being deleted).

Definitions

- “Southern Wetland” environment is shown on Whangamarino Wetland Type Map included as Attachment A of this consent
- “Wetland Bog” is shown on Whangamarino Wetland Type Map included as Attachment A of this consent
- “Wetland Fen” is shown on Whangamarino Wetland Type Map included as Attachment A of this consent
- “Pungarehu Canal Farm Bridge” location is included in Attachment B (as discharge monitoring site) of this consent
- “Lake Waikare outlet control gate” is referred to as the Northern Outlet Control Gate (NOCG).

Advisory Notes:

Overall Sediment Deposition Management Objectives

- A. The consent holder acknowledges that Waikato-Tainui are recognised as the Treaty Partner with the Crown and are therefore regarded as having a specific role and function in relation to the management of the Waikato River which includes Lake Waikare and the Whangamarino Wetland as described in the Waikato-Tainui Raupatu Claims (Waikato River) Settlement Act 2010 and the subsequent Joint Management Agreement. The provisions of the Settlement, the Waikato River Vision and Strategy and the Waikato-Tainui Environmental Plan will be considered when assessing future options and solutions to address sediment deposition from the NOCG and Canal.
 - B. The priority for reduction of sediment deposition shall be based on the Southern Wetland environment of the Whangamarino Wetland complex. Consideration will also be provided to the northern and central wetland environments.
 - C. Within the Whangamarino Wetland complex wetland environments there shall be priority placed on the avoidance of effects and the protection and enhancement of the "wetland bog" environments followed in priority by the "wetland fen" environments.
 - D. The consent holder shall progressively reduce sediment discharge through the Northern Outlet Control Gate in the short, medium and long term on a prioritised
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basis, including 'early interventions' as specified in conditions 24 to 27 below.

- E. The consent holder shall ensure that any actions and options implementation, associated with conditions 16 - 50, support and are integrated with catchment-wide initiatives and approach for the Lake Waikare and Whangamarino catchments including the development of the Catchment Management Plan and the Healthy Rivers Plan Change.

CONDITIONS OF CONSENT

Liaison Group

16. Within 6 months from the date this condition commences the consent holder shall invite the following parties to form a Liaison Group:
- a. Waikato-Tainui;
 - b. Department of Conservation;
 - c. Fish and Game New Zealand, Auckland/Waikato Region;
 - d. Ngaa Muka Development Trust;
 - e. Waahi Whaanui Trust;
 - f. Malcolm Lumsden;
 - g. Euan Williamson;
 - h. Waikato Regional Council and
 - i. Any other party with a known interest
17. The purpose of the Liaison Group shall be to meet to discuss progress with the requirements of conditions of this consent. The consent holder shall provide updates of progress of conditions 24 to 40 as available to inform the Liaison Group and seek feedback as required.
18. The opportunity for meetings shall continue at least at 6 monthly intervals thereafter, unless all of the listed parties agree otherwise. The invitation for any meeting shall be provided to the parties with no less than 14 days written notice.

Advice Note: The consent holder shall be deemed to have complied with this condition if the opportunity to meet with the parties is provided and the required notice is given.

Peer Review Panel

19. Within 6 months from the date this condition commences the consent holder shall nominate a Peer Review Panel. The Peer Review Panel shall be independent of the consent holder and will collectively have recognised qualifications and experience in, but not limited to:
 - a) Sediment transport and deposition processes;
 - b) Hydrological and hydraulic analysis and monitoring;
 - c) Water quality; and
 - d) Wetland ecology.

20. Where an appointed member of the Peer Review Panel resigns or is unable to continue on the panel, the consent holder shall nominate a replacement panel member who shall have similar or complementary skills to continue the recognised qualifications and experience listed condition 19.

21. The Peer Review Panel shall be approved in writing by the Waikato Regional Council. In offering approval to the establishment and personnel make-up of the Peer Review Panel, the Waikato Regional Council shall be limited to an assessment of whether or not the Peer Reviewer(s) meet the requirements of condition 19 above.

22. The Peer Review Panel shall be independent from the planning, analysis, data collection and writing of the reports referred to in conditions 30 and 35;

23. In undertaking its functions, the Peer Review Panel shall in each case critically assess the relevant work, report or plan submitted by the consent holder for its review, and shall advise the consent holder in writing whether:
 - a) the work, report or plan addresses all the matters required;
 - b) the work, report or plan addresses all matters to an adequate standard;
 - c) any assessment, or methods or options to be implemented are supported by the technical analysis and available monitoring data; and
 - d) Any other comment the Peer Review Panel wishes to make.

Immediate Investigation and Actions

24. The consent holder shall undertake the monitoring programme detailed in conditions 47 and 48 below (including continuous turbidity data collection) to determine sediment concentrations from the Northern Outlet Control Gate and Pungarehu Canal. The sediment concentration reduction requirement is detailed within Conditions 41 and 42 below.

 25. Within 6 months from the date this condition commences, the consent holder shall fully investigate, including flood model analysis, the operation of the Northern Outlet
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Control Gate, in particular during high Lake Waikare levels. The purpose of this condition is to establish the most effective range of operating conditions for the NCOG. The results of this investigation shall be reported to Waikato Regional Council within a further 2 month period. The report shall include results of the investigation, the methods used, any assumptions made or verifications carried out, and any further investigations or options leading to a reduction in the discharge of sediment concentrations resulting from the operation of the NCOG. As part of the investigation and reporting in this condition the consent holder shall seek feedback from the Liaison Group established in Condition 16 above.

26. The consent holder shall, within 6 months from the date this condition commences, complete a Pungarehu Canal bank stabilisation programme, inclusive of any erosion remediation, immediately downstream of the Northern Outlet Control Gate. The programme shall include removal of areas of identified instability and sediment source and the prevention of future erosion. These areas shall be stabilised, with vegetation or otherwise, within this period or as soon possible thereafter. If any further consents are required to allow these works the 6 month period for completion is extended by the period to obtain such consents. The stabilisation programme shall include the retirement of the banks of the canal to prevent stock access. All works under this condition must be completed to the satisfaction of the the Waikato Regional Council is consent authority.
27. If any other immediate actions to reduce wetland sediment deposition, associated with the Northern Outlet Control Gate and Pungarehu Canal are identified over a two year period from the date this condition commences, the consent holder shall discuss directly with Waikato Regional Council to determine the appropriate course of action to allow such an action to be implemented as soon as is practicable. To minimise delay in implementation, such actions will not be subject to the Peer Review Process as identified within the conditions of this consent or may be the subject of informal discussions with the Peer Review panel.

Preliminary investigation and reporting

28. The consent holder shall analyse the available information, and collect and assess additional data as outlined below, for the purpose of identifying a possible solution or solutions to reduce the sediment discharged through the Northern Outlet Control Gate with the intention of reducing the amount of deposition of sediment in the Whangamarino Wetland and the Pungarehu Canal.
 29. The data collection and/or analysis shall as a minimum include (but not limited to):
 - a) Water levels in the Waikato River, (at the existing recorder sites at Rangiriri and the Whangamarino Gates), Lake Waikare and Whangamarino Wetland;
 - b) Water flows and discharge volumes for Lake Waikare and Whangamarino Wetland;
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- c) Collection of continuous turbidity data and correlation of turbidity with total suspended solids (TSS) to assist in modelling of sediment loads;
- d) Field sampling and particle size analysis of the sediments discharged through the Northern Outlet Control Gate;
- e) Update the sediment balance assessment using modelling of flows and TSS concentration;
- f) Investigate the Northern Outlet Control Gate operation and its effects on the wetland hydrology;
- g) Hydraulic modelling to simulate flow regime and frequency of overflow into the mineralised wetland with and without other known influences including flows from the Whangamarino River and the Whangamarino Weir (as authorised under resource consent 890227) in place;
- h) Modelling to assess the benefits of various mitigation options proposed;
- i) Reassess likely sediment deposition under various operating regimes; and
- j) Interaction with other activities within the catchment.

30. Within 12 months from the date this condition commences, the consent holder shall prepare a written report the purpose of which is to:

- a) Report the findings of the data analysis and collection as required in condition 29 above;
 - b) Comment on the likely success of the options available to reduce total suspended sediment concentration required by conditions 38 and 39 below, including but not limited to the following options:
 - Construction of settlement areas within the outlet canal environment;
 - Construction of artificial wetlands alongside the outlet canal;
 - Installation of a weir upstream from the Northern Outlet Control Gate within Lake Waikare to capture sediment in Lake Waikare;
 - Removal of settled sediment from the wetland;
 - Changes to the Northern Outlet Control Gate operation including the details within condition 25 above and those outcomes;
 - Placement of further flood internal stopbanks within the wetland; and
 - Other options that are identified as a result of the actions required by condition 27 above.
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- c) Include any comments/feedback obtained from the Liaison Group established as part of condition 16;
 - d) Provide recommendations on a possible option or options to minimise the amount and/or adverse effects of sediment discharged through the Northern Outlet Control Gate that deposits in the Whangamarino Wetland that merit further detailed investigation. Note any option does not need to be limited to the list in 30b).
31. The Peer Review Panel shall within 2 months of receipt of the report outlined in Condition 30, provide a critical assessment of the report in accordance with the provisions of condition 23.
32. Within two weeks of receiving the Peer Review Panel assessment, the consent holder shall forward a copy of the Peer Reviewed report to the Waikato Regional Council and to the Liaison Group established in condition 16 for information purposes. A separate report shall be submitted to the Waikato Regional Council which shall include documentation of the Peer Review Panel assessment, recommendations and include commentary on adoption of recommendations of the Panel, and explanation of any departure from the recommendations made.
33. Within one month of receiving the Peer Review Panel assessment the consent holder shall continue with a detailed assessment of option(s), as detailed in condition 34 below.

Detailed investigations and report

34. The consent holder shall undertake a detailed investigation of the options recommended in the report required by condition 30 once the Peer Review Panel agrees that the requirements of condition 30 have been met. The detailed investigation shall include as a minimum;
- a) A detailed consideration of the technical feasibility, cost and likely success in achieving the sediment concentration reduction limit detailed in conditions 41 and 42 below and to minimise the amount and/or adverse effects of sediment discharged through the Northern Outlet Control Gate that deposits in the Whangamarino Wetland.
 - b) Detailed investigation of the benefits and any likely adverse effects of the preferred option(s).
35. Within 12 months from the completion of the report as required by Condition 30 above, the consent holder shall prepare a written report the purpose of which is to:
- a) Report the findings of the detailed investigation as required in condition 34a) above, especially the benefits expected from each option;
 - b) Include any comments/feedback obtained from the Liaison Group established in condition 16;
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- c) Identify the preferred option(s) that is/are to be implemented, the rationale for selection and how it will achieve the suspended sediment reduction limits detailed in conditions 41 and 42 and how it will reduce the amount of sediment discharged through the Northern Outlet Control Gate and the associated adverse on the Whangamarino Wetland.
 - d) Include a monitoring plan to demonstrate the effectiveness of the preferred option(s) including data collection to demonstrate the achievement of the suspended sediment reduction limits established in conditions 41 and 42 below. The plan shall specify the timing and frequency of this monitoring. The monitoring plan may include the monitoring required in condition 47 below and any additional monitoring necessary to achieve the purpose of this condition.
 - e) Include an implementation plan that details the process and timeline for implementing the selected option(s), including applying for any additional authorisations required.
36. The Peer Review Panel shall within 2 months of receipt of the report outlined in Condition 35 above, provide a critical assessment of the report in accordance with the provisions of condition 23.
37. Within two weeks of receiving the Peer Review Panel assessment, the consent holder shall forward a copy of the Peer Reviewed report to the Waikato Regional Council and to the Liaison Group established in condition 16 for information purposes. The consent holder shall submit a separate report to the Waikato Regional Council which shall include documentation of the Peer Review Panel assessment and recommendations, commentary on adoption of recommendations of the Panel, and explanation of any departure from the recommendations made.

Implementation of option(s)

38. Within one month of receiving the Peer Review Panel assessment the consent holder shall commence the implementation of the preferred option(s) detailed in condition 35c).
39. The consent holder shall outline the implementation programme to the Liaison Group as established in condition 16 and identify key milestones of the programme. The consent holder shall as a minimum provide updates on the achievements of key milestones at the regular meetings of the Liaison Group.
40. The consent holder shall provide an annual report by 30 June each year the consent is current up to 2020 detailing:
- a) Actions carried out during the previous 12 months up to 30 June.
 - b) Adherence to the implementation programme as required by condition 35e.
 - c) Achievements of milestones as identified in condition 39.
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The annual implementation report shall be provided to the Liaison Group as established in condition 16.

Sediment concentration reduction limit

41. A 5% reduction (or greater) in the mean annual total suspended sediment (TSS) concentration and NTU measured at the Pungarehu Canal Farm Bridge shall be achieved before 31 December 2020 and maintained thereafter. The 5% reduction will be assessed against the baseline TSS/NTU data determined by the results of the first 12 months of monitoring as detailed within Condition 47 below.
42. A 10% (or greater) reduction in the mean annual total suspended sediment (TSS) concentration and NTU measured at the Pungarehu Canal Farm Bridge shall be achieved before 31 December 2030 and maintained thereafter. The 10% reduction will be assessed against the baseline TSS/NTU data determined by the results of the first 12 months of monitoring as detailed within Condition 47 below.

Water levels

43. Except to the extent that the consent holder is legally required to open the Northern Outlet Control Gate under Resource Consent 101725, the consent holder shall cease any discharge of water under this consent when the water level in Whangamarino Wetland (recorded at Ropeway Water Level Recorder) meets or exceeds 4.0 m RL.
 44. Where discharge of water has ceased under condition 43, the consent holder may recommence discharging under this consent when the water level in Whangamarino Wetland (recorded at Ropeway Water Level Recorder) has reduced to below 4.0 m RL and is static or falling, or under circumstances where the consent holder is legally required to open the Northern Outlet Control Gate under RC 101725.
 45. Any discharge of water through the Northern Outlet Control Gate when the water level in the Whangamarino Wetland meets or exceeds 4.0 m RL (recorded at Ropeway Water Level Recorder) shall be recorded by the consent holder, specifying:
 - a) the time and date that the discharge commenced and ceased; and
 - b) the water levels (at recorded at Ropeway Water Level Recorder) during the period of discharge; and
 - c) the volumes of water and estimated sediment loads discharged during the period of discharge; and
 - d) if applicable, the reasons why the consent holder considered it was legally required to open the Northern Outlet Control Gate under RC 101725, and the duration of the circumstances in which those reasons applied; and
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- e) if applicable, the nature of any emergency which prompted the discharge while the water level in Whangamarino Wetland was at or above 4.0 m RL.
46. The record of any discharge of water through the Northern Outlet Control Gate required to be kept under condition 45 shall be provided, on a six monthly basis, to the Waikato Regional Council, with a copy to be provided to the Peer Review Panel and the Liaison Group.

Advice Note: This condition does not prevent management actions in an emergency situation, in accordance with s 330, 330A or 330B of the RMA.

Monitoring

47. Within six months of this condition commencing, the consent holder shall carry out the following monitoring:
- a) Surveys of the level and rate (mm/yr) of sediment deposition and the proportional (%) contribution of the Waikare discharge to sediment deposition at six transects as indicated in Attachment B of this consent. The methods for monitoring sediment deposition shall be:
- i. Surveys of ground level of sediment position within the mineralised swamp area between Falls Road and the Pungarehu Canal Farm Bridge at six transects as indicated in Attachment B of this consent. Surveys shall be conducted in 2016 and 2017 and then every two years thereafter for the purposes of determining the level and rate of sediment build-up. The survey shall consist of six transects at fixed locations at least 200 m apart. Spot heights shall be taken at 10 m intervals. The ground level survey shall employ methods that enable accurate assessment of sediment deposition rate (mm/yr) including the use of fixed survey poles.
 - ii. The proportional (%) contribution of sediment deposited from the Lake Waikare Discharge shall be assessed at 24 sites (Sites M1 to M12 and Sites F1 to F12) located as shown on the six transects as indicated in Attachment B. Surveys shall be conducted in 2016 and 2017 and then every two years thereafter. The methods utilised shall include the Compound-Specific Stable Isotope (CSSI) technique as detailed in the protocols produced by Dr. Gibbs in NIWA Client Report HAM2010-129. The methods of sampling shall be documented and made available to the Waikato Regional Council and the Liaison Group established in condition 16 on request.
 - iii. The monitoring and analysis of sediment deposition shall be undertaken by a suitably qualified and experienced person (or persons) who demonstrates that they understand the methods to use for sampling and analysis including preservation of samples.
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- b) Monitor and record the total volume of water discharged into Lake Waikare via the Matahuru Stream on a daily basis.
- c) Monitor and record the total volume of water and maximum rate of discharge into the Pungarehu canal via the Northern Outlet Control Gate on a daily basis.
- d) Continuously monitor and record the turbidity of the water discharged into the Pungarehu canal via the Northern Outlet Control Gate.
- e) Continuously monitor and record the turbidity of the water in the Pungarehu Canal at the Pungarehu Canal Farm Bridge site. The total suspended sediment concentrations are to be recorded monthly at the same site.
- f) Water quality of Lake Waikare, the Matahuru Stream, and the Pungarehu Canal once every two months. To this end monitoring shall include the parameters and locations as set out below (locations are NZMS 260 map references):

Lake Waikare site 1 S13:065-167	Lake Waikare site 2 S13:069-194	Matahuru Stream S13:083-109	Pungarehu Canal S13:053-210
Temperature	Temperature	Suspended sediment	Continuous Turbidity
Dissolved Oxygen	Dissolved Oxygen	Turbidity	Total phosphorus
Chlorophyll a	Chlorophyll a		Suspended Sediment
Secchi depth	Secchi depth		Total Nitrogen
Total phosphorus	Total phosphorus		Ammonia
Total nitrogen	Total nitrogen		Nitrate plus nitrite nitrogen
Dissolved reactive	Dissolved reactive		
Total kjeldahl nitrogen	Total kjeldahl nitrogen		
Ammonia	Ammonia		
Nitrate plus nitrite nitrogen	Nitrate plus nitrite nitrogen		
pH	pH		
Conductivity	Conductivity		
Volatile suspended sediment	Volatile suspended sediment		
Suspended sediment	Suspended sediment		
Turbidity	Turbidity		

48. The results shall be provided to the Liaison Group as established in condition 16 within one month of the completion of each survey.

Reporting

49. The consent holder shall compile an annual monitoring report for the year ending 30 June for each year this consent is current. As a minimum the report shall:
- a) Include a summary of all the data collected as required under the conditions of this consent, including any monitoring developed in condition 35. For any continuously recorded parameters the summary shall include annual and monthly means, and daily maximum and minimum values. The consent holder shall keep all the raw data collected under the conditions of this consent in an electronic and tabulated form for at least the term of the consent and make this data available to the Waikato Regional Council and the Liaison Group on request.
 - b) Critically analyse the information collected in accordance with the conditions of this consent, in terms of compliance and potential for actual adverse environmental effects.
 - c) Critically analyse the information collected under condition 47 and provide a commentary on whether or not the sediment reduction limits as detailed in conditions 41 and 42 respectively have been achieved and maintained;
 - d) Compare data with previously collected and reported results and identify and comment on any emerging trends.
 - e) Critically evaluate the performance of the procedures and physical mechanisms in place to minimise any adverse effects associated with the exercise of this consent, identify any improvements undertaken and make recommendations on any additional improvements needed, with respect to procedures or mechanisms relating to the exercise of this consent.
 - f) Make recommendations on alterations/additions to the monitoring programme if necessary.
 - g) Any other issue considered important by the consent holder including other catchment wide activities and interventions that may apply.

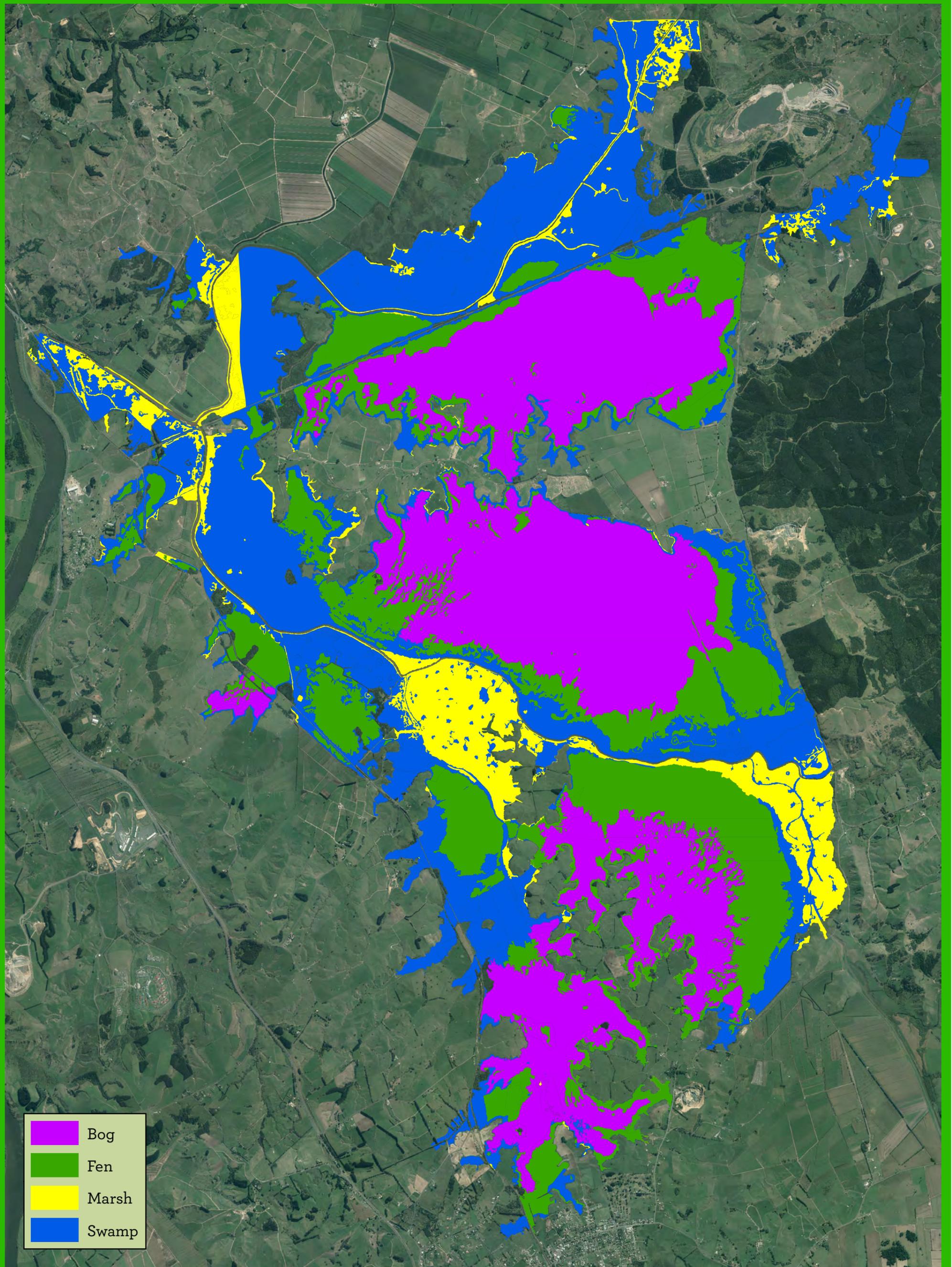
The report shall be forwarded to the Waikato Regional Council by 30 August for each year that the consent is current. The consent holder shall make copies of the report available to the Liaison Group established by condition 16 and any other party who may request it.

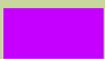
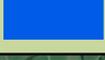
The monitoring report shall be to a standard acceptable to the Waikato Regional Council. In determining if the monitoring report is to an acceptable standard, the Waikato Regional Council shall be limited to an assessment of whether or not the monitoring report adequately addresses the matters identified in the conditions.

50. If the annual monitoring report as detailed in condition 49 above indicates that the sediment reduction limits as detailed in conditions 41 and 42 respectively have not been met by the required dates and maintained, the following process will apply:
- a) The consent holder shall undertake further investigations of additional potential options to manage the effects of the discharge from the Northern Outlet Control Gate. These investigations shall include ongoing gathering of hydrological information regarding the Northern Outlet Control Gate discharge and associated investigation into the impact of downstream sediment deposition.
 - b) The consent holder shall further investigate options to further avoid, remedy or mitigate, the effects of, and amounts of, discharge of sediment and to address any achievement with the sediment concentration reduction limit as specified in Conditions 41 and 42.
 - c) Consult with the Peer Review Panel and obtain feedback from the Liaison Group as established under condition 16 above.
 - d) Prepare and implement a Revised Options Plan that will specify the proposed course of action and associated timeframes to address and achieve the sediment concentration reduction limits as specified in conditions 41 and 42.
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Attachment A





-  Bog
-  Fen
-  Marsh
-  Swamp

Whangamarino Wetland Type Map



Department of Conservation
Te Papa Atawhai
New Zealand Government

Attachment B



