

24 December 2021

Gleeson Group
17 Aerovista Place
Wiri
P.O. Box 97034
MANUKAU CITY, AUCKLAND 2241

Attention: Mark Pelan
Chief Financial Officer

Dear Mark,

Huntly Managed Fill: Wetland Peer Review

1.0 Introduction

Gleeson Group are proposing to operate a managed fill facility at the Gleeson Quarries site located at 310 Riverview Road, Huntly. There are five gullies and four potential fill areas that have been identified on farmland to the north of the active quarry (Figure 1-1). Fill Area 2 and Fill Area 4 have been assessed as “natural inland wetlands” under the National Policy Statement for Freshwater Management (NPS-FM) and the Resource Management (National Environmental Standards for Freshwater) Regulations 2020 (NES-F). Gleeson Group have requested a peer review of this assessment to inform the next steps of the resource consent process.



Figure 1-1: Site location showing identified wetlands (blue polygons) (BML, 2019)

2.0 Aim and Methodology

Stantec was requested to provide a peer review of Fill Areas 2 and 4 to inform the resource consent process for the proposed managed fill facility. The purpose of the assessment is to determine the likely presence and impacts on wetlands, streams and riparian areas. The methodology involved:

- Desktop assessment of existing information on the wetlands and streams on site:
 - Previous technical reports that have been prepared for the site including:
 - Ecological Impact Assessment completed by Boffa Miskell (2019)
 - Technical Memo prepared by Paua Planning (2020)
 - Aerial photographs
 - Site photographs (if available)
 - Publicly available databases and technical reports
- Wetland assessment to describe:
 - Identification of any “natural inland wetlands” as defined in the National Environmental Standards for Freshwater (NES-F) and National Policy Statement for Freshwater Management 2020 (NPS-FM).
 - Updated assessment based on the Guidance Document on the wetland regulations released by the Ministry for the Environment in September 2021.
 - Comment on the Discussion Document and proposed amendments to the wetland regulations released by the Ministry for the Environment (MfE) in September 2021.
- Site visit on 15 December 2021 to view Fill Areas 2 and 4. The purpose of the site visit was to verify the information provided and to assess the likely presence of wetlands that have formed as a result of natural processes, induced by human activity, and/or constructed for a specific purpose.
- Preparation of a brief letter report summarising the findings of the assessment.

Note that the initial desktop assessment was based on information provided by Gleeson Group and third parties. Stantec has made no independent verification of the accuracy of this information. A brief site visit was undertaken to determine whether the areas were natural, constructed or induced. No wetland delineation, vegetation surveys, or other assessments were undertaken as this had previously been completed by others.

3.0 Results

3.1 Wetland Definitions

Wetlands are among the most threatened ecosystems in New Zealand and have been reduced significantly from their former extent. Only 10 percent of the original wetlands of New Zealand now remain (Dymond, 2021).

Wetlands are defined in the Resource Management Act (1991) as follows:

Wetland includes permanently or intermittently wet areas, shallow water, and land water margins that support a natural ecosystem of plants and animals that are adapted to wet conditions.

The National Policy Statement for Freshwater Management (NPS-FM) 2020 defines natural wetlands as follows:

Natural wetland means a wetland (as defined in the Act) that is not:

- (a) a wetland constructed by artificial means (unless it was constructed to offset impacts on, or restore, an existing or former natural wetland); or
- (b) a geothermal wetland; or
- (c) any area of improved pasture that, at the commencement date, is dominated by (that is more than 50% of) exotic pasture species and is subject to temporary rain derived water pooling.

Natural inland wetland means a natural wetland that is not in the coastal marine area.

The National Environmental Standards for Freshwater (NES-F) 2020 place very strict rules on development in or near wetlands.

- If any earthworks are occurring in a wetland, resulting or likely to result in complete or partial drainage, then this would be prohibited under regulation 53 of the NES-F.
- Any earthworks outside, but within 100m from a natural wetland resulting or likely to result in complete or partial drainage is a non-complying activity under regulation 52 of the NES-F.

There are special rules for the construction and maintenance of specified infrastructure, which includes public services and flood control,¹ so long as certain conditions are met. There are also proposed amendments to the regulations that will provide a consenting pathway for landfills, cleanfills and managed fills (MfE, 2021). However, in the absence of enacted legislation, this assessment has been conducted based on the existing regulations and Ministry for the Environment (MfE) guidance provided to date (MfE, 2021).

3.2 Regional and District Context

There are 28,226 hectares of identified wetlands (greater than 0.5 ha in size) remaining in the Waikato Region (Ausseil, 2008). This has been reduced from an original 356,516 hectares through clearance and land drainage to enable agricultural land use. This is a loss of approximately 92.1%. The Waikato retains a smaller proportion of its historic extent than the national average (7.9% versus 10.1% nationally). Of note is the large proportion of bog wetland habitat in the Waikato, with 80% of this habitat type in the region located in just two sites: the Whangamarino wetland and Kopuatai peat dome. Importantly, the Kopuatai site is the largest wetland in New Zealand.

The Waikato Regional Plan (WRP) defers to the Resource Management Act (1991) definition of wetlands. The WRP has an objective to manage waterbodies to ensure "*an increase in the extent and quality of the Region's wetlands*" (s3.1.2). Under rule 3.7.4.6 the creation of deepening of drains within 200 metres of listed wetlands are discretionary activities requiring resource consent, and under rule 3.7.4.7, the drainage of any wetland is a discretionary activity if it is "*a wetland that is an area of significant indigenous vegetation and/or significant habitat of indigenous fauna*".

On 30 June 2021 the WRP was amended to insert clauses related to the NPS-FM. This resulted in the inclusion of Policy 3.A.2:

Policy 3.A.2: Natural Inland Wetlands. The loss of extent of natural inland wetlands is avoided, their values are protected, and their restoration is promoted, except where:

a) the loss of extent or values arises from any of the following:

- (i) the customary harvest of food or resources undertaken in accordance with tikanga Māori
- (ii) restoration activities
- (iii) scientific research
- (iv) the sustainable harvest of sphagnum moss
- (v) the construction or maintenance of wetland utility structures (as defined in the Resource Management (National Environmental Standards for Freshwater) Regulations 2020)
- (vi) the maintenance or operation of specified infrastructure, or other infrastructure (as defined in the Resource Management (National Environmental Standards for Freshwater) Regulations 2020)
- (vii) natural hazard works (as defined in the Resource Management (National Environmental Standards for Freshwater) Regulations 2020); or

b) the Regional Council is satisfied that:

- (i) the activity is necessary for the construction or upgrade of specified infrastructure; and

¹ As per the definition of "specified infrastructure" in section 3.21 of the NPS-FM (2020)

- (ii) the specified infrastructure will provide significant national or regional benefits; and
- (iii) there is a functional need for the specified infrastructure in that location; and
- (iv) the effects of the activity are managed through applying the effects management hierarchy.

In the case of the Gleeson Quarry site, the exemptions listed under Policy 3.A.2 do not apply.

In the Waikato District Plan, 310 Riverview Road, Huntly is zoned Rural land. It is listed as an Aggregate Extraction Policy Area, Aggregate Resource Policy Area, is subject to a Transmission Line easement, and is located within the Waikato River Catchment. The 40-metre-wide riparian strip adjacent to the Waikato River is listed as a Landscape Policy Area. Approximately 10 metres of this width falls within the boundary of the Gleeson Quarries site. Otherwise, there are no areas of ecological significance or other Natural Resource restrictions identified on site in the District Plan.

3.3 Previous Assessments

A summary of previous studies related to Fill Areas 2 and 4 is provided in Table 3-1. Selected site photographs and graphics are reproduced in Appendices A and B. Two letters written by the son of a former landowner to describe the history of the site are provided in Appendix C.

Two wetland ecological assessments have been undertaken on the site to date. Additional work has been undertaken by planners and geology experts.

Boffa Miskell Limited prepared an Ecological Impact Assessment (EclA) in support of the managed fill application in November 2019 (BML, 2019). Field work including terrestrial and freshwater ecological surveys were conducted from 25 to 29 June 2019. As this was winter, targeted surveys for lizards, bats and wetland birds were not undertaken. Four wetland areas were identified across the five gullies:

- **Site 1:** 200 m² wetland. Not proposed for fill.
- **Fill Area 2:** 450 m² wetland. (Currently withdrawn from the consent application due to uncertainty regarding wetland status.)
- **Fill Area 3:** 700 m² wetland. Former mine tailings disposal site.
- **Fill Area 4:** 380 m² wetland. (Currently withdrawn from the consent application due to uncertainty regarding wetland status.)
- **Fill Area 5:** No wetland identified. Consent was granted in 2021 for use as an area for quarry overburden.

All five sites met the Resource Management Act (1991) definition of wetland. They were found to be significant under Regional Council criteria based on the “reasonable likelihood that threatened native fauna may inhabit or use” the areas (BML, 2019, p. 40). The creation of 1,530 m² of wetland was proposed to offset the loss of 1530 m² of wetland habitat in fill areas 2, 3, and 4. This is an offset ration of 1:1 (wetland loss to wetland creation).

A draft letter report was prepared by Wildlands in October 2020. A site visit was carried out on 7 October 2020 to delineate the wetland boundaries in Fill Areas 2, 3 and 4 based on the vegetation delineation tool (Clarkson, 2013). Areas defined as wetland were then assessed against the NES-F criteria. Three wetland areas were assessed and two were found to meet the definition of a “natural inland wetland”:

- **Fill Area 2:** 570 m² natural inland wetland.
- **Fill Area 3:** 815 m² wetland. A former pond and associated wetland is no longer present (it has been drained). Not considered to be a natural inland wetland.
- **Fill Area 4:** 484 m² natural inland wetland.

Fill Areas 2 or 4 were considered to be modified by human activity, namely a farm crossing and dam, but were not considered to be constructed by artificial means.

Table 3-1: Summary of information reviewed

Date	Description	Fill Area 2	Fill Area 4
12-Nov-2019	Letter from Wildlands to client c/o Paua Planning re. Offset Location Assessment	The works will result in the loss of approximately 1,530 m ² of wetland habitat in Fill Areas 2-4.	The works will result in the loss of approximately 1,530 m ² of wetland habitat in Fill Areas 2-4.
14-Nov-2019	Ecological Impact Assessment prepared by Boffa Miskell Limited. Four wetland areas were identified on site as per the RMA definition. All sites were assessed to be low ecological value but may provide habitat for wetland birds. The sites were all considered "significant" under criteria 4 and 6 of the WRC Regional Policy Statement.	450 m ² wetland within Fill Area 2 in former pine area: <i>"A small patch of wetland and open water is situated approximately two thirds up the gully (Figure 1). Forestry tracks about the wetland immediately upstream and downstream and have probably modified its size and depth. Vegetation is a mosaic of native and exotic sedges and herbs, including Carex virgata, common water milfoil, water pepper, Gahnia xanthocarpa, soft rush, buttercup, spearwort, kikuyu and various other herbaceous weeds and grasses."</i> Impacted upstream and downstream from two forestry tracks; loss of upstream extent due to forestry track; lack of connectivity to the downstream catchment due to bunding and absence of defined stream channel.	380 m ² wetland within Fill Area 4 in former pine area: <i>"A small wetland is located in the downstream section of the middle reach, and appears to have been artificially induced through the bunding of the watercourse to create a forestry track. Mature Carex secta grades into a thin strip of native scrub vegetation including mamaku, ponga, wheki ponga, kawakawa, and mahoe which is bounded by the planted redwoods. A few mature native trees are interspersed through the redwoods, including pukatea, tawa and rimu (with epiphytes including kiekie and Astelia)."</i> Impacted downstream from a forestry track; lack of connectivity to the downstream catchment due to a culvert and absence of defined stream channel.
28-Nov-2019	Lodgement of resource consent application	As above.	As above.
18-Dec-2019	Section 92 Request for Further Information issued by WRC. Sought clarification on restoration activities.	No specific requests on wetland ecology or classification. Requested more information on Fill Area 2 geology.	No specific requests on wetland ecology or classification. No specific requests on Fill Area 4.
23-Jan-2020	Section 92 Response issued by Paua Planning	No specific information on wetland ecology or classification.	No specific information on wetland ecology or classification.
03-Feb-2020	Additional section 92 Response by Paua Planning	As above.	As above.
17-Feb-2020	Additional section 92 Response by Paua Planning	As above.	As above.
Oct-2020	Delineation of Wetland Areas (draft letter report from Wildlands)	The area supports 570 m ² of natural inland wetland : <i>"The wetland within Fill Area 2 is located across flat ground within a steep gully, upstream of a farm track...A small pond has formed upstream of the crossing, with the wetland extending beyond the pond to the base of the surrounding slopes".</i> <i>"Although the form of the wetland is likely to have been altered by the farm crossing, there is no</i>	The area supports 484 m ² of natural inland wetland : <i>"The wetland within Fill Area 4 is located across a gully floor upstream of a dam created to facilitate the construction of a farm track. The presence of a small indigenous wetland dominated by Carex spp. sedgeland downstream of the dam suggests there may have been a wetland across at least part of this area prior to the dam construction."</i>

Date	Description	Fill Area 2	Fill Area 4
		<i>evidence to suggest the wetland itself was constructed by artificial means".</i>	<i>"Although the form of the wetland is likely to have been altered by the dam, there is no evidence to suggest the wetland itself was constructed by artificial means."</i>
23-Nov-2020	Memo from Kate Madsen (Paua Planning) to WRC, as well as various appendices.	<p>The wetland in Fill Area 2 is constructed by artificial means:</p> <p><i>"...the wetlands are not 'natural' but were...created as a result of human interference with seasonal watercourses and overland flow paths within existing gullies".</i></p> <p>According to a letter written by Mike Or'Reilly (son of former landowner) dated 13-Nov-2021:</p> <p><i>"there were several ponds 'constructed' along the way to give water for stock"</i></p> <p>The ponds in Fill Area 2 and 4 were made when farm access tracks were put in approximately the 1950s. The ponds were maintained by being dug out periodically. The ponds were also used for duck shooting.</p>	<p>The wetland in Fill Area 4 is constructed by artificial means:</p> <p><i>"...the wetlands are not 'natural' but were...created as a result of human interference with seasonal watercourses and overland flow paths within existing gullies".</i></p> <p><i>"A larger farm dam of approximately 6 metres height is present near the base of the gully which has created an area of ponded water. A smaller dam structure comprised forestry slash and clay fill has been created approximately 100m upstream of the larger farm dam".</i></p> <p>According to a letter written by Mike Or'Reilly (son of former landowner) dated 13-Nov-2021:</p> <p><i>"there were several ponds 'constructed' along the way to give water for stock"</i></p> <p>The ponds in Fill Area 2 and 4 were made when farm access tracks were put in approximately the 1950s. The ponds were maintained by being dug out periodically. The ponds were also used for duck shooting.</p>
22-Jan-2021	Email from Emma Cowan of WRC to Kate Madsen of Paua Planning	<p>Wetland classification is unclear:</p> <p><i>" With regard to Fill Areas 2 and 4, it has not been determined whether the wetlands are natural or artificial. I consider that the evidence provided is not strong enough to support the applicant's position that the wetlands are artificial"</i></p>	<p>Wetland classification is unclear:</p> <p><i>" With regard to Fill Areas 2 and 4, it has not been determined whether the wetlands are natural or artificial. I consider that the evidence provided is not strong enough to support the applicant's position that the wetlands are artificial"</i></p>
02-Feb-2021	Memo from Michael Parsonson (Sothern Skies) to Kate Madsen (Paua Planning). The wetland in Fill Area 4 is considered to be formed by forestry road construction	N/A	<p>Result of site visit to Fill Area 4 to inspect geology:</p> <p><i>" A pond within the Fill 4 gully is clearly formed by a relatively high (circa 4m) constructed bund which also provides access across the gully. The pond and upstream catchment discharge through the bund via a pipe... The pond extends up the gully and is surrounded by redwoods... I have little doubt that the pond and wetted area immediately upstream of the pond is a result of the formation of the pond."</i></p>

Date	Description	Fill Area 2	Fill Area 4
16-Feb-2021	Response to WRC regarding decreasing the scope of the application to Fill Area 3 Only by Paua Planning	N/A	N/A
Mar-2021	Report prepared by Wildlands: <i>Revised Ecological Management Plan for Fill Area 3 Compensation Site</i>	N/A	N/A
Sep-2021	Guidance document released by MfE including additional information regarding induced and constructed wetlands: <i>'Induced wetlands' are wetlands that have resulted from any human activity, except the deliberate construction of a wetland or waterbody by artificial means... They are considered 'natural wetlands'.</i>	N/A	N/A
16-Dec-2021	Updated letter from Mike O'Reilly (son of former landowner) regarding the history of the site	Fill Area 2 and 4 were <i>"built...specifically to create a pond for stock to have water to drink"</i> .	Fill Area 2 and 4 were <i>"built...specifically to create a pond for stock to have water to drink"</i> . <i>"My Uncle Phil made the pond in gully 4 sufficiently large so that he could shoot ducks in it. Duck shooting was the secondary reason he built the dam and pond in gully 4."</i>

The Boffa Miskell assessment was undertaken prior to the enactment of the NPS-FM and NES-F. The Wildlands assessment was undertaken after the policy was released but before guidance was issued by the Ministry for the Environment in September 2021. This justifies undertaking a third-party peer review to determine if anything has changed.

4.0 Independent Assessment

4.1 Review of Policy Requirements

The rules in the NES-F are very stringent. Any activity that causes drainage of natural wetland extent is only available as a last resort under limited circumstances. The wetland policies in the NPS-FM are intended to protect the extent and values of *all* remaining natural inland wetlands regardless of their size or condition (MfE, 2021). This is to prevent fragmentation of remaining wetland habitat.

In September 2021, MfE released a guidance document which provided additional information on the definitions of constructed wetlands and introduced a new term of induced wetlands (MfE, 2021). This confirmed that the NPS-FM rules do not apply to constructed wetlands but do apply to wetlands induced by human activity. Note that the advice on induced wetlands is counter to previous guidance issued from the MfE to Auckland Council, which has since been retracted (MfE, 2021).

Excerpts from the MfE (2021) guidance:

- The NPS-FM applies regardless of wetland condition. Natural wetlands include degraded wetlands.
- There is no minimum size for a natural wetland.

Wetlands constructed by artificial means:

“‘Wetlands constructed by artificial means’ includes wetlands and waterbodies that have been **deliberately constructed for a specific purpose** and that **may require maintenance** over time (for example, vegetation or silt removal) to continue to fulfil that purpose. This includes areas of wetland habitat that have formed in or around any deliberately constructed waterbody.”

Examples of constructed wetlands:

- nutrient attenuation
- effluent treatment and disposal systems, including pond or barrier ditch systems, and areas installed for sediment control
- stormwater management
- reservoirs for firefighting
- hydroelectric power generation
- irrigation
- stock watering
- domestic and community water supply
- water storage ponds
- landscaping to create a wetland or waterbody
- other artificial water-storage facilities, including artificial watercourses under the RMA and engineered soil conservation structures, including sediment ponds and sediment traps
- hunting.

Induced wetlands

“‘Induced wetlands’ are wetlands that have **resulted from any human activity**, except the deliberate construction of a wetland or waterbody by artificial means... They are considered ‘natural wetlands’.”

Examples of induced wetlands:

- wetland induced through an overflowing culvert

- wetland induced as an unintentional result of forestry
- remnant wetland habitats, eg, those associated with drainage channels and other works installed to drain a natural wetland
- wetland induced through stock pugging
- wetland induced through roading works.

Improved pasture

The NPS-FM defines improved pasture as: “An area of land where exotic pasture species have been **deliberately sown or maintained** for the purpose of pasture production, and species composition and growth has been modified and is being **managed for livestock grazing**.”

“To be excluded from the definition of a ‘natural wetland’, the area must also have ground cover of **more than 50 per cent exotic pasture** species, and the presence of temporary **rain-derived pooling**...using the hydrology tool to assess the presence of permanent wetland hydrology.”

In September 2021, the MfE also released a discussed document on proposed amendments to the wetland regulations (MfE, 2021). If enacted, the changes would introduce consenting pathways for the following industries, in addition to the existing consenting pathway for specified infrastructure:

- Quarrying
- Landfills, cleanfills and managed fills
- Mining (minerals)
- Urban development

There is a proposed change to the ‘improved pasture’ exemption to make the definition clearer, separate native and exotic groundcover species, and remove the requirement for rain derived pooling. It also removes the requirement for the pasture to have existed prior to the NES-F commencement date. The third change to the policy is to allow wetland maintenance activities to occur as part of restoration activities. The proposed consenting pathway for landfills, cleanfills and managed fills apply in this instance. The definition to be applied is consistent with the proposed activities at the Gleeson’s site:

Landfills: receive contaminated material and are a necessary part of expanding urban areas.

Cleanfills: receive natural materials, such as clay, gravel, rock and soil, from areas that are not contaminated with chemicals.

Managed fills: are designed for material with low-grade contamination, such as demolition material received from existing infrastructure.

The proposed consenting pathway would create a new discretionary activity² status for the activities and operation of fills within, or within 100 metres of, a ‘natural wetland’. It is noted that consents for this type of activity would require an assessment of environmental effect and be determined by councils on a case-by-case basis.

² Discretionary activities: resource consents are required and local and/or regional councils may decline or grant the consent depending on their assessment of effects of the proposal on the environment. If granted, the activity must comply with the conditions set out in the NES-F and any additional conditions imposed by the council.

4.2 Fill Area 2

Review of Existing Information

The wetland within Fill Area 2 is located upstream of a farm track. According to the son of the former landowner, the pond in Fill Area 2 was made for stock watering purposes when farm tracks were put in in the 1950s (O'Reilly M. , 2020; O'Reilly M. P., 2021). Evidence from aerial photography suggests that the pond was formed later than this (below and Appendix B).

In 1973, Fill Area 2 comprised of a vegetated gully with grassy upper slopes. The vegetation appears to be regenerating native bush such as immature kanuka or similar, with a flow path or watercourse evident through the centre of the valley. Sometime between 1973 and 1979 this vegetation was cleared.

A site photograph taken in 1979 (Figure 4-3) shows fresh earthworks in the vicinity of the Fill Area 2 wetland. This shows an excavated pond with dam and access track, presumably constructed for stock watering purposes. Importantly, the pond is a standalone structure and did not establish as a consequence of the farm track or similar. This indicates that it was constructed for a specific purpose and not induced.

What cannot be verified is whether there was a natural wetland present prior to the formation of the pond. However, the steep topography, limited catchment size and original vegetation type indicates that it may have been an ephemeral stream.

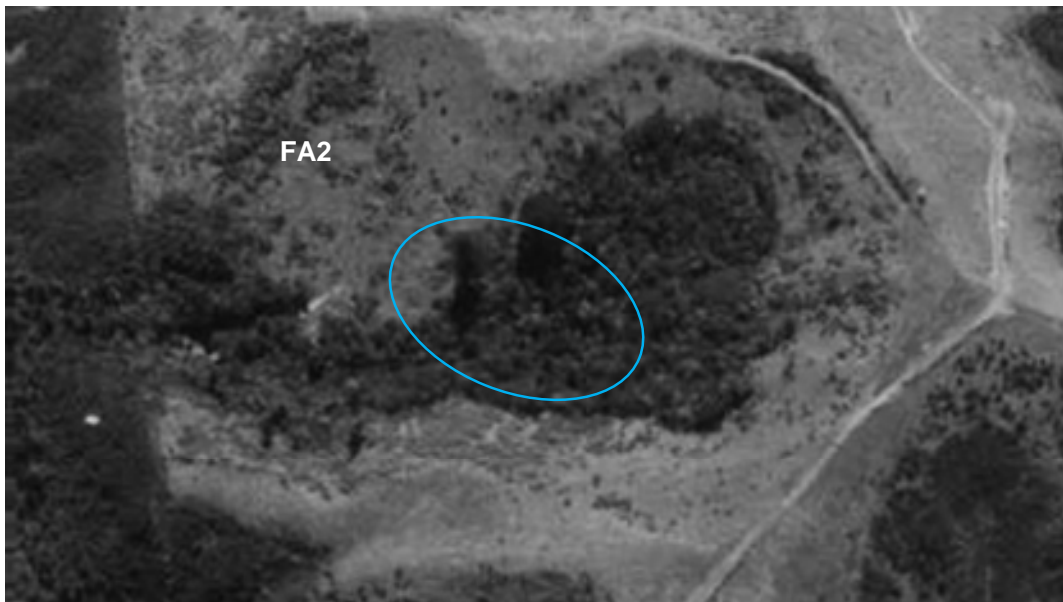


Figure 4-2: Fill Area 2 in 1973 (Source: Retrolens)

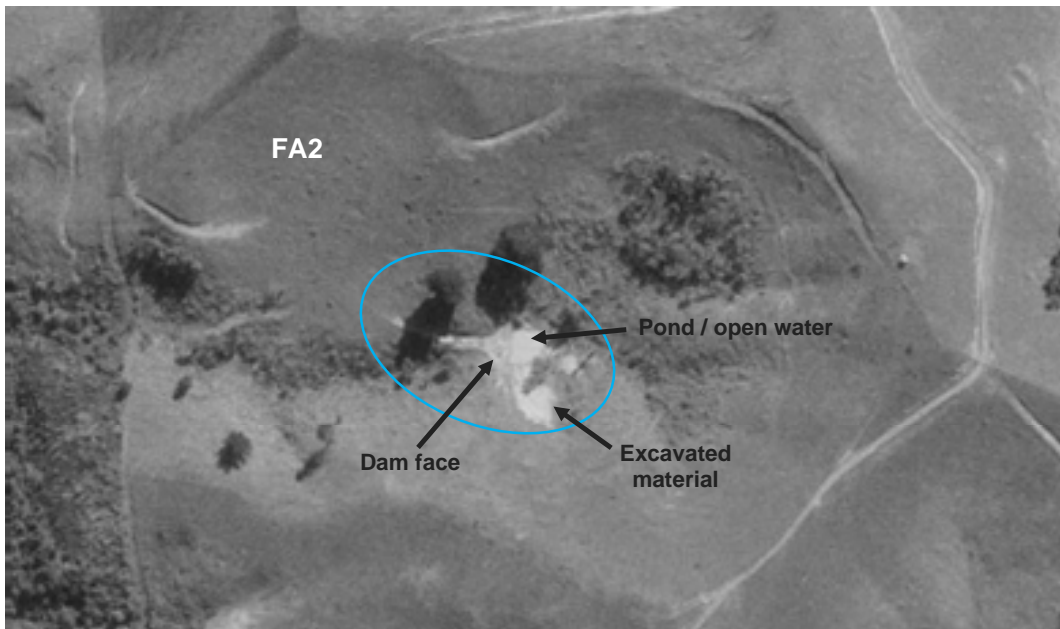


Figure 4-3: Fill Area 2 in 1979 showing excavated farm pond (Source: Retrolens)

Site Visit

The site visit confirmed the presence of an open water wetland with marginal wetland vegetation in Fill Area 2. The wetland has been formed behind an earthen dam which has become overgrown with gorse since the pines were felled in 2017 and grazing ceased in 2018 (when the land was purchased by Gleeson and Cox). The outlet to the pond flows overland via the dam and no outlet pipe was visible. The client indicated that there may be a pipe, however it is either buried beneath vegetation and/or blocked. It was clear that the dam was previously constructed using earthmoving equipment. The track down to the dam was clearly visible and the earthen dam showed an obvious elevation change to the natural stream bed below.

The pond itself had high turbidity due to recent heavy rain. On the edge of the open water, plant species are dominated by facultative wetland species including rautahi (*Carex geminata*), other native sedges and rushes (*Carex flagellifera* and *Juncus* sp.) with occasional native water pepper (*Persicaria decipiens*) and giant rush (*Juncus pallidus*). On the drier edges, plants include exotic marsh bedstraw (*Galium palustre*) and lesser spearwort (*Ranunculus flammula*) growing amongst cocksfoot (*Dactylis glomerata*) and Yorkshire fog (*Holcus lanatus*), with occasional yellow umbrella sedge (*Cyperus eragrostis*), kikuyu (*Cenchrus clandestinus*), pampas (*Cortaderia* sp.) and grey willow (*Salix cinerea*) saplings.



Plate 4-1: Wetland in Fill Area 2 (looking U/S)



Plate 4-2: Pond outlet flowing overland (looking D/S)



Plate 4-3: Gorse has colonised the top of the dam (looking U/S towards the pond)



Plate 4-4: Access track constructed when the pond was dug (wetland situated behind photographer)



Plate 4-5: Wetland located within Fill Area 2



Plate 4-6: Wetland looking down the gully

4.2 Fill Area 4

Review of Existing Information

The wetland within Fill Area 4 is located upstream of a farm track. According to the former landowner, the pond in Fill Area 4 was made for stock watering and duck shooting purposes when farm tracks were established in the 1950s (O'Reilly M. , 2020; O'Reilly M. P., 2021). This is consistent with evidence from aerial photography (below and Appendix B).



Figure 4-4: Fill Area 4 in 1973 with open water wetland (Source: Retrolens)

The wetland that comprises Fill Area 4 was present in 1973, the earliest site photograph. This shows an area of open water immediately upstream of a farm track (Figure 4-4). The farm track and wetland are still present in the present day, although now a second access track occurs at the upstream extent. This was constructed in 2017 when the pine forest was harvested.

A report prepared by Wildlands (Reaburn, 2020) states that there is a small wetland downstream of the farm track which indicates that there may have been a wetland across at least part of this area prior to the road construction. Various reports describe the farm track as a road and a dam (Table 3-1). There is conflicting information as to the height of the road, which forms a dam. It is between 4-6 metres high.

What could not be verified from the desktop review is whether the pond was constructed separately to, or has formed as a consequence of, farm track construction. This is important as it is part of the definition in the NPS-FW and associated guidance. This was verified by way of the site visit.

Site Visit

The site visit confirmed the presence of an open-water wetland pond surrounded by mature redwood trees (*Sequoia sempervirens*). Wetland vegetation is dominated by mature pukio (*Carex secta*) with rautahi, kiekie (*Freycinetia banksii*), kiokio (*Parablechnum novae-zelandiae*) and occasional swamp sedge (*Carex virgata*).

Macrophytes water pepper, duckweed (*Lemna minor*) and azolla fern (*Azolla pinata*) occupy the open water. Species on the drier edges include wheki (*Dicksonia squarrosa*), mahoe (*Meliclytus ramiflorus*), silver fern (*Cyathea dealbata*), with exotic pampas and Chinese privet (*Ligustrum sinense*). The species composition is different to Fill Area 2 due to the larger area of standing water and higher degree of shading.

The downstream extent of the wetland is formed by a very tall, 8 to 10 metre high, earth dam. The site visit determined that the dam was taller than the 4-6 metres estimated previously. The outlet from the dam is a culvert (circa. 25-30cm diameter) beneath the farm track which discharges via a near-vertical corrugated half-round pipe. The outlet of this pipe is perched, creating a barrier to fish passage. The dam is of such a large size that it is considered that the pond has been deliberately constructed i.e. the dam was built specifically to create a pond for stock watering and duck shooting. It is too large to have been formed solely for the purposes of a stream crossing.

The Wildlands report noted a small area of wetland vegetation downstream of the dam as evidence that there may have been a natural wetland present before the pond was constructed.³ This current assessment considers this unlikely, given the steep topography and defined stream channel above the dam.



Plate 4-7: Wetland in Fill Area 4 (looking U/S)



Plate 4-8: Wetland in Fill Area 4 (looking D/S)



Plate 4-9: Upstream of the pond there is a stream



Plate 4-10: The top of the dam colonised by gorse

³ The gully downstream of the dam is outside of the scope of this assessment and, according to Wildlands maps, is outside of Fill Area 4 (refer Appendix A).



Plate 4-11: Top portion of the dam face



Plate 4-12: Dam face from across the valley



Plate 4-13a,b,c: The outlet from the pond is a culvert and half-round corrugated pipe

5.0 Discussion

5.1 Fill Area 2

On the basis of historical aerial photographs, evidence from the son of a former landowner, and the site visit, it is considered that the wetland in Fill Area 2 was originally a farm pond constructed for stock watering purposes. The date of construction was approximately 1979 (or slightly earlier). The pond was dug out and an earthen dam formed to retain water. A culvert outlet may or may not be present, but if it is, it is currently either blocked or overgrown. Over the years, with the conversion from grazing to pine forest, and then back again, the pond has gradually become vegetated and (no doubt) partially filled with sediment. Stock watering troughs were also installed to provide alternative water supplies. Therefore, the site has not been used for stock watering for some time, allowing wetland vegetation to establish.

It is therefore considered that the wetland within Fill Area 2 classifies as a "wetland constructed by artificial means". This is because it has formed due to the presence of a waterbody that was deliberately constructed for a specific purpose, namely, a pond for stock watering. According to the former landowner, it was also maintained for this purpose, at least initially. There is no timeframe in the NPS-FM definition for the consideration of wetlands constructed by artificial means. This means that the exclusion applies no matter when the wetland was constructed. Therefore, even though the pond was constructed in 1979, the exclusion can still apply.

5.2 Fill Area 4

On the basis of evidence from the son of a former landowner, and the site visit, it is considered that the wetland in Fill Area 4 was a farm pond constructed for stock watering and hunting (duck shooting). The date of construction was the 1950s. The downstream extent of the pond is a very large dam (8 to 10 metres in height) that is far too big to have been built solely for a stock crossing. The outlet of the pond is a culvert and corrugated half-round pipe which constitutes a barrier to fish passage. Over the years, the pond has become vegetated and partially filled with sediment. This process was likely accelerated in 2018 when the pine forest was felled. Stock watering troughs were also installed to provide alternative water supplies. Therefore, the site has not been used for stock watering for some time. It is unknown when the site was last for duck shooting. No maimai is present.

It is therefore considered that the wetland within Fill Area 4 classifies as a "wetland constructed by artificial means". This is because it has formed due to the presence of a waterbody that was deliberately constructed for a specific purpose, namely, a pond for stock watering and duck shooting. According to the former landowner, it was also maintained for this purpose, at least initially. There is no timeframe in the NPS-FM definition for the consideration of wetlands constructed by artificial means. This means that the exclusion applies no matter when the wetland was constructed. Therefore, even though the pond was constructed in the 1950s, the exclusion can still apply.

6.0 Conclusion

The peer review has found that the ponds within Fill Area 2 and Fill Area 4 have been constructed directly as a result of human activity. Fill Areas 2 and 4 are considered to be "wetlands constructed by artificial means" as there is photographic, written and physical evidence that they were originally constructed as a farm ponds for stock watering and hunting.

Should the consenting pathway proposed in the amendments to the NPS-FM be enacted, this would create a new discretionary activity status for the operation of fills within, or within 100 metres of, a 'natural wetland'. This would likely apply to both of these fill sites. However, the timeframe for these changes is currently unknown.

Yours sincerely



Kristy Harrison
Senior Principal Environmental Scientist
Stantec New Zealand



Reviewed By: **Dr Bram Mulling,**
Principal Environmental Scientist
Stantec New Zealand

Encl.: Appendix A: Images and Site Photographs
Appendix B: Retrolens and Google Earth Pro Aerial Images

Copy to: Kate Madsen, Paua Planning

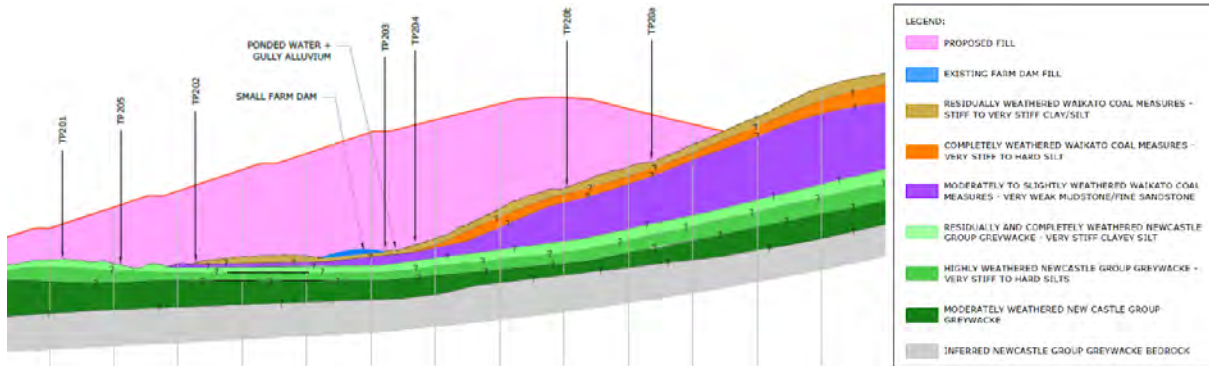
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Appendix A: Images and Site Photographs

Fill Area 2



Fill Area 2 - Dark blue shows existing farm dam fill (Gaia, 2019 in Madsen, 2020)



Fill Area 2 showing wetland extent (Reaburn, 2020)



Fill Area 2 wetland from the true left bank (BML, 2019)



Fill Area 2 wetland looking U/S (BML, 2019)

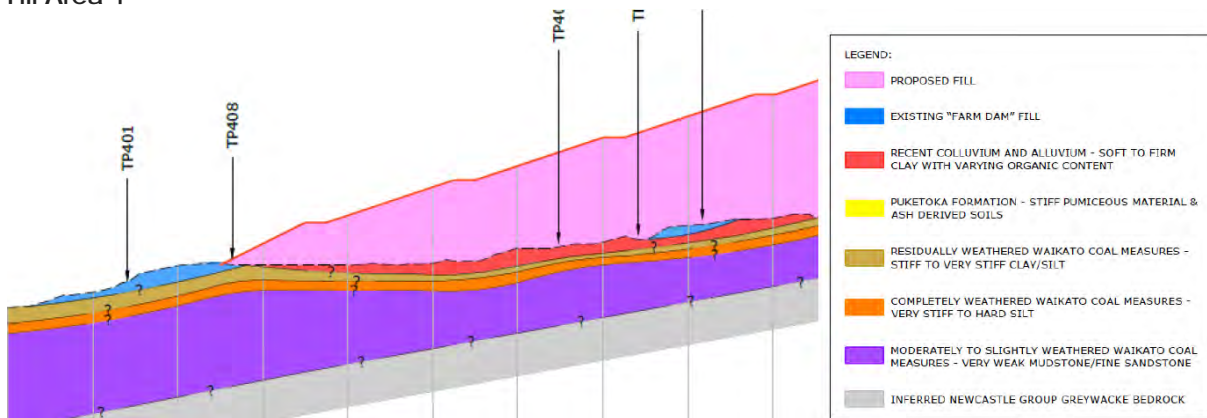


Pond, Carex sedgeland, and soft rush rushland in Fill Area 2 (Reaburn, 2020)



Upstream extent with gorse and inkweed (Reaburn, 2020)

Fill Area 4



Fill Area 4 - Blue shows existing farm dam fill (Gaia, 2019 in Madsen, 2020)



Fill Area 4 showing wetland extent (Reaburn, 2020)



Aerial taken after 2016 forest harvesting (Parsonson, 2021)



Fill Area 4 wetland with exotic redwoods (BML, 2019)



Fill Area 4 wetland (BML, 2019)

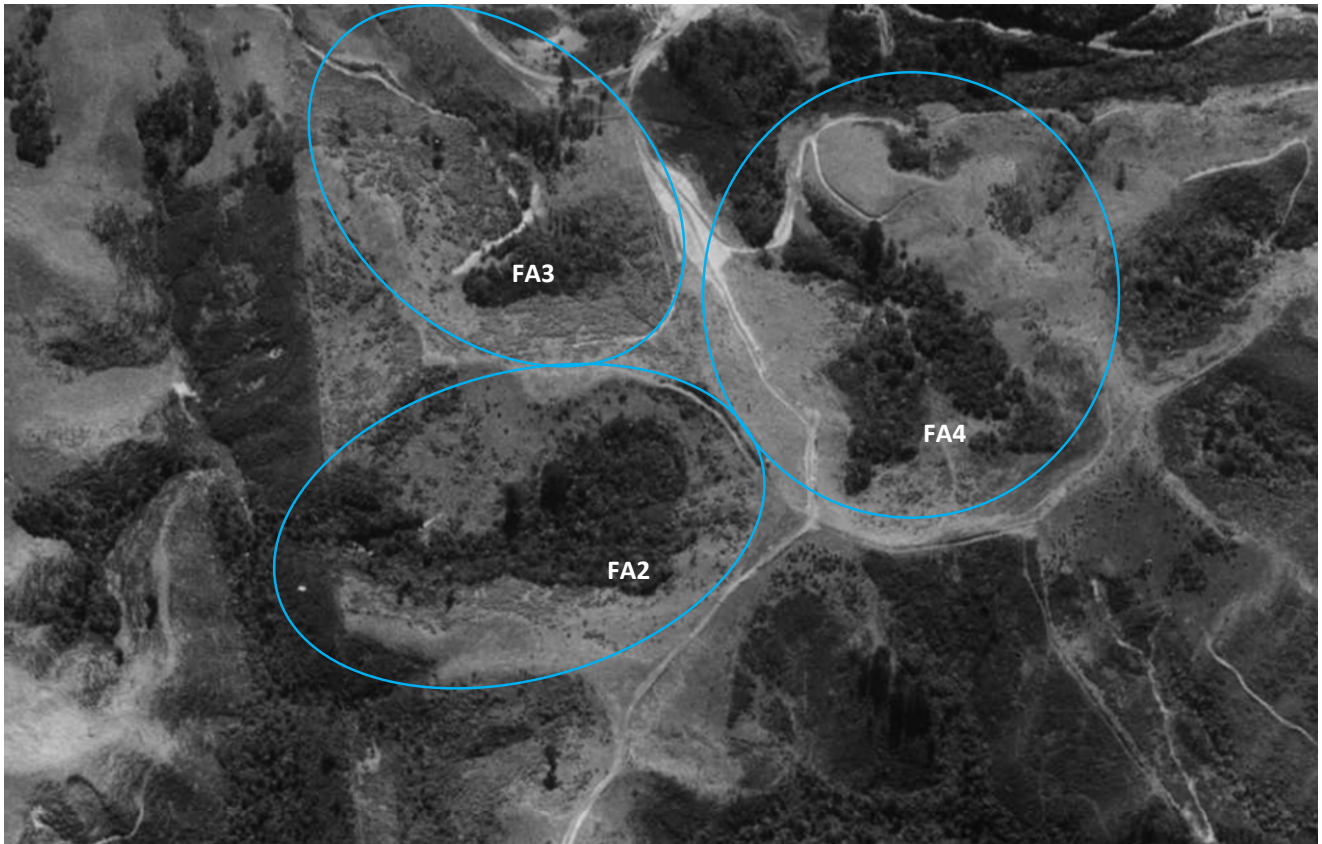


Carex secta sedgeland and open water within the wetland in Fill Area 4 (Reaburn, 2020)

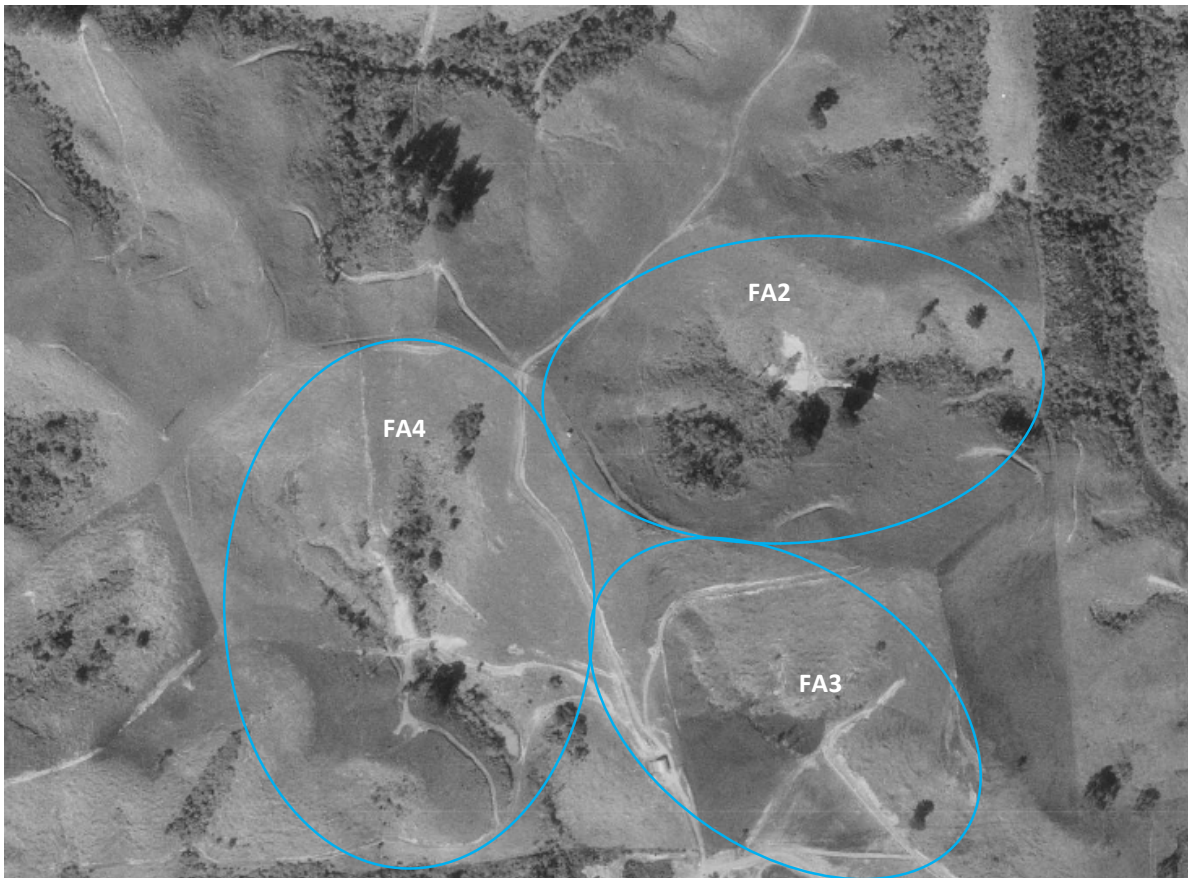


Fill Area 4 wetland boundary with *Carex secta*, kikuyu and gorse (Reaburn, 2020)

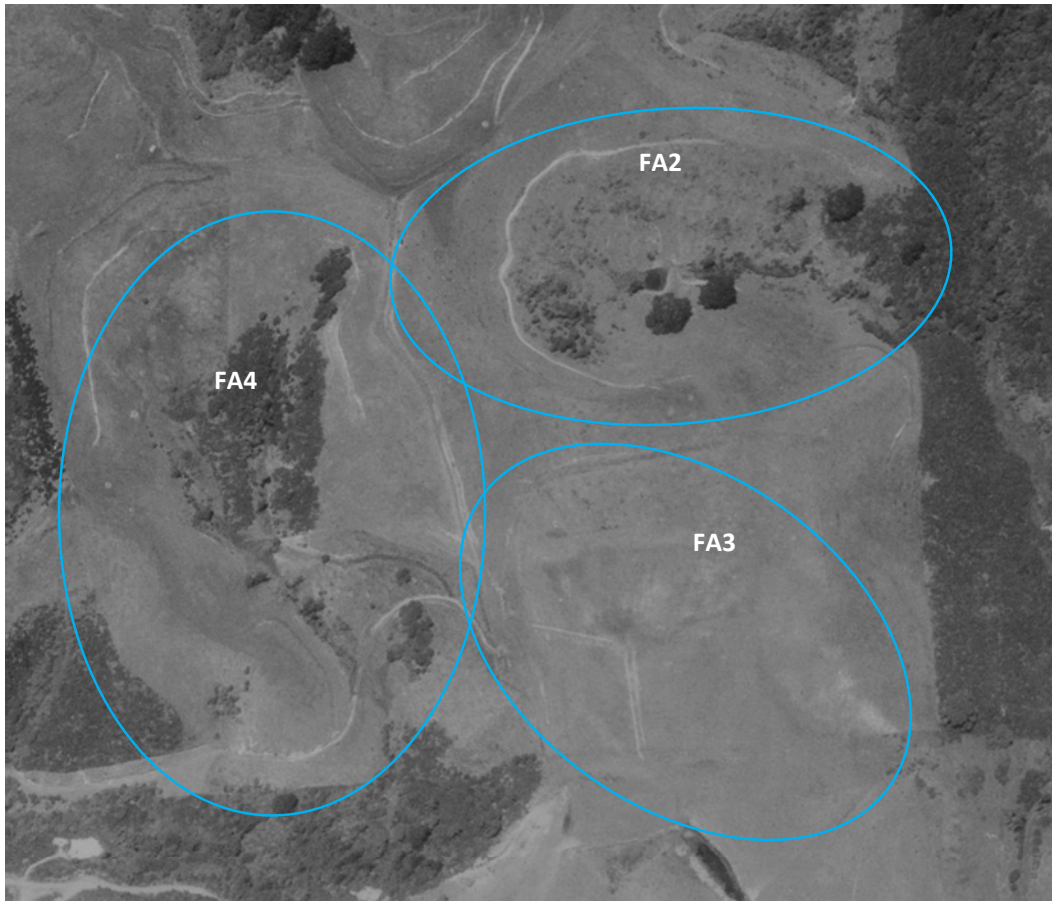
Appendix B: Retrolens and Google Earth Pro Aerial Images (adapted from Madsen, 2020)



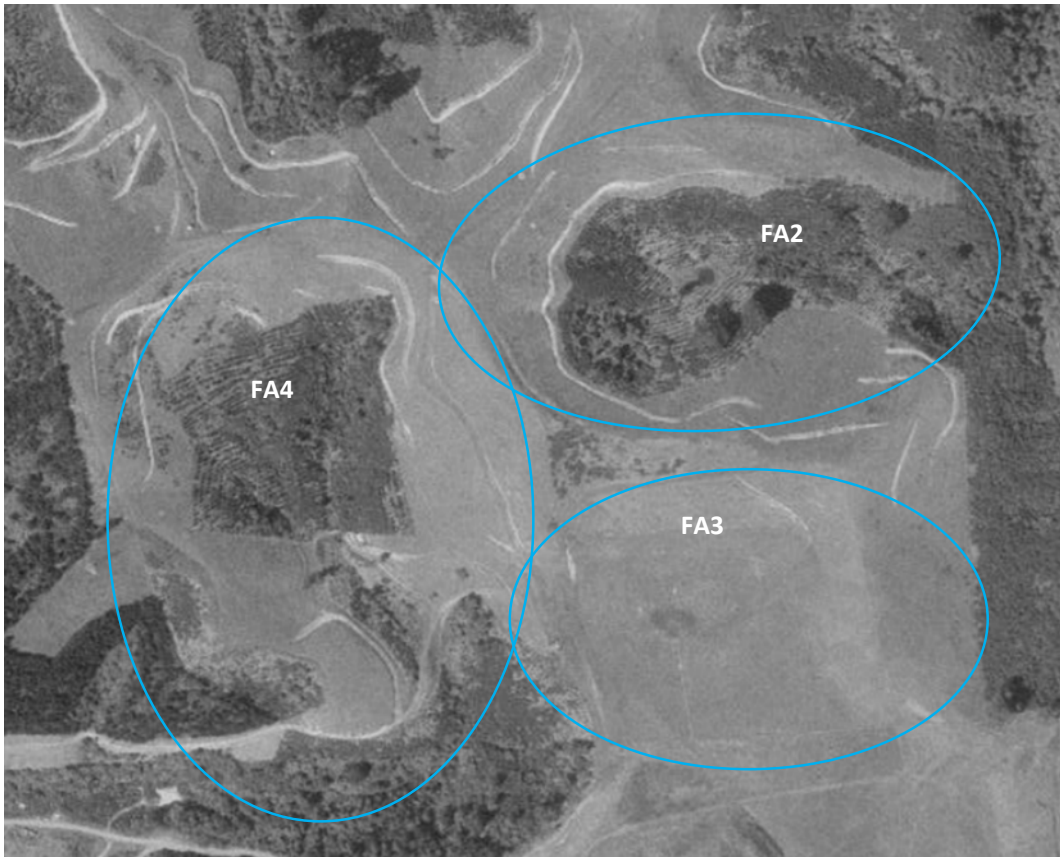
Retrolens 1973 Fill Area 2 Image 1



Retrolens September 1979: Fill Area 2 Image 2



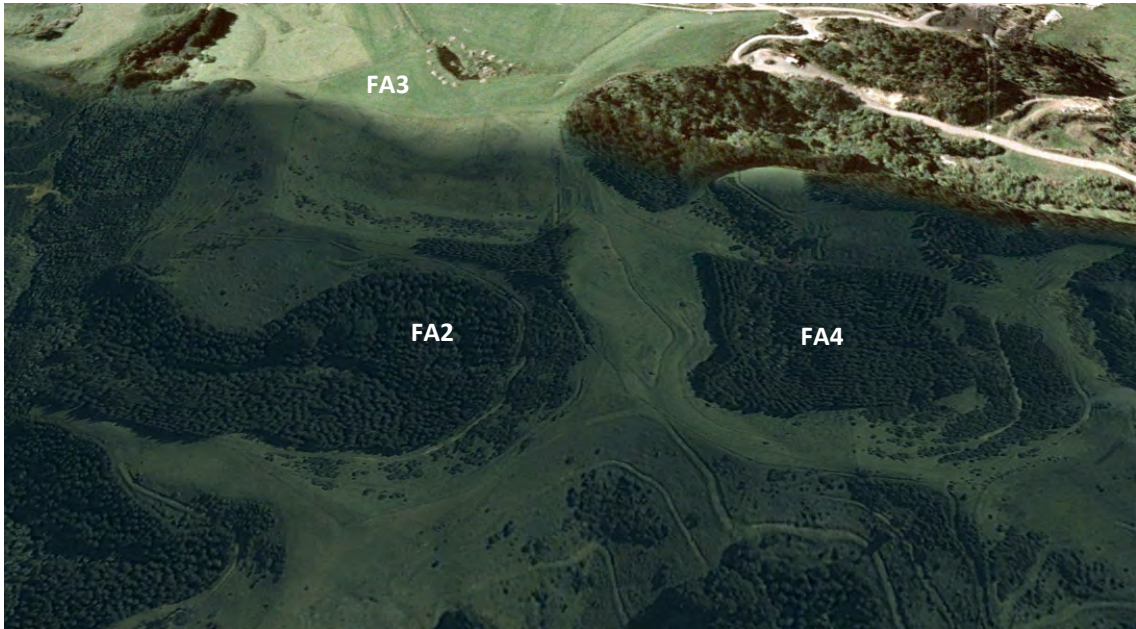
Retrolens August 1991



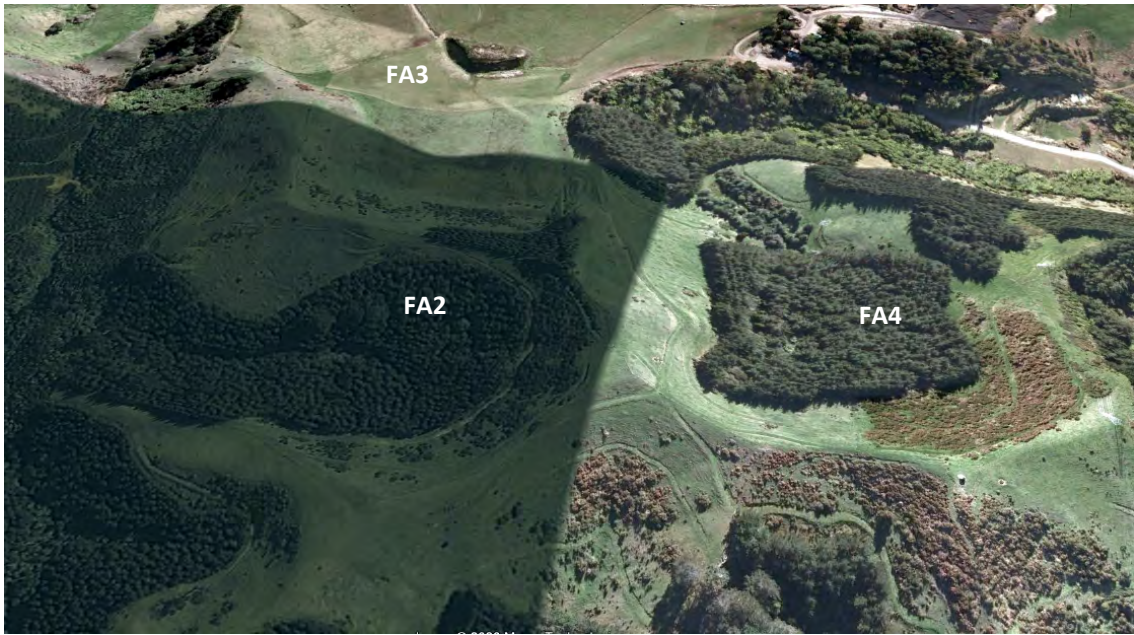
Retrolens February 1995



Google Earth April 2002



Google earth January 2008



Google Earth May 2009



Google Earth May 2010



Google Earth January 2013



Google Earth August 2014



Google Earth Mach 2015



Google Earth September 2015



Google Earth March 2016



Google Earth February 2017



Google Earth February 2018



Google Earth February 2019

Appendix C: Letters from Mike O'Reilly

13 November 2020

To whom it may concern

Re: Farm access tracks on Gleeson property in Huntly

Gleeson's have asked me to provide some history with regards to the 3 ponds on what others sometime refer to as "the Payne block" and what Gleeson's refer to as fill area 2, fill area 3 and fill area 4.

My family have owned land in this area since 1947, and my grandparents and parents have bought and sold land to farm and mine during this period.

The block of land containing fill area 2, fill area 3 and fill area 4 was owned and farmed by my grandparents – Phil and Anna O'Reilly and when they passed the land was transferred to their sons Terry O'Reilly (my father) and Phil O'Reilly (my uncle). This block was used to farm Sheep.

Dad managed the mining operations and uncle Phil managed the farming operations.

The original farm access tracks were cut approximately in the 1950's.

Dad and his brother used a Caterpillar D4 to maintain the tracks up from the shearing sheds near the road on the northern boundary directly west and into the farm. The tracks were for farm management purposes; to bring the sheep in to be drenched, shorn, or sold, and also to spray gorse.

There were several ponds "constructed" along the way, to give water for stock (sheep and beef). This meant they didn't have to pump water for the stock. I remember Dad using his UH04 Hitachi digger to clean them out periodically. Uncle Phil used to go duck shooting on these ponds.

Fill area 3 is an old fill site for mine waste from Weavers pit (now lake Puketurini). State Coal filled several gullies in the area and they were grassed over. They placed topsoil directly on the pug, and this resulted in poor drainage.

From memory, Mr Stroud purchased it, then Mr Payne, then Stevensons. They all ran beefies on it, and pine trees were planted.

The runoff from Fill area 3 was directed into a pond on our farm. Within the last decade a pond was dug (fill area 3) with a small dozer to provide drinking water for the cattle. The other ponds in fill area 2 and 4 were made when the tracks were put in.

Any clarification, please call me on 0274 535 393

Thanks



Mike O'Reilly

16 December 2021

To whom it may concern

Re: Farm access tracks on Gleeson property in Huntly – further explanation

Gleeson's have asked me to provide extra information to my letter dated 13th November 2020 with regards to the purpose of the 3 ponds on what others sometime refer to as "the Payne block" and what Gleeson's refer to as gully 2, gully 3 and gully 4.

It was my uncle Phil who built these dams in gully 2 and gully 4 specifically to create a pond for stock to have water to drink. I believe this was in the 1950's. At this time there was no water pump or troughs.

The land has always been dry and there were no other ponds or wet areas nearby. Sheep could drink from the newly built ponds and my uncle Phil made the pond in gully 4 sufficiently large so that he could shoot ducks on it. Duck shooting was the secondary reason he built the dam and pond in gully 4.

Fill area 3 is an old fill site for mine tailings filled by State Coal, as is well documented. The gully was eventually capped and returned as stock pasture. The pond was created later for the stock to drink from.

All 3 ponds and surrounding wetted areas were man made for stock water for farming, and also for duck shooting which my uncle Phil enjoyed.

Any clarification, please call me on 0274 535 393

Thanks

A handwritten signature in blue ink that reads "M. P. O'Reilly". The signature is written in a cursive style with a period at the end.

Mike O'Reilly

Appendix D: Site Photographs from Stantec Site Visit (16 December 2021)

Fill Area 2



Wetland area in Fill Area 2



Fill Area 2 showing the entire valley and wetland (centre-right of photo)

Fill Area 4



Wetland area in Fill Area 4



Fill area 4 looking across the valley and upstream towards the dam and redwood trees



Fill Area 4 looking down the valley. The wetland cannot be seen as it is within the redwood trees at the centre rear of the photo