



Air & Water Discharge Strategies

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Napier Works Manager



Thanks everyone for attending. Understand that it's going to be an interesting morning over Zoom, but we will do the best we can. It's important that we share this with you, and I'm looking forward to your feedback on this topic.

This presentation is intended to give an overview of the strategy documents we shared in draft, and provide a bit more context around some things.

The Discharge Strategies are cornerstone documents, underpinning a complete review of emission management on the Site looking forward to the replacement of the company's resource consent. The documents set out the 'what' and 'why' for our consent application.

Agenda

- Project Objective
- Background
- Discharges to Air
- Discharges to Water
- HARP

Objective of the project overall – important because this is what we want the strategies to achieve.

A bit of background on how the strategies were developed.

Specifics on contaminants that are being discharged to Air and Water.

Finish with discussing Ravensdown's intentions for a restoration project.

Overall Project Objective

“To establish the most sustainable long-term solution for treatment and discharges from the Ravensdown Napier Works to enable the continued operation of the site”



The objective lays the basis for what the strategy needs to achieve.

Project objective sets the direction, but also needs to be balanced and sustainable. Can't rob Peter to pay Paul.

The project objective reflects Ravensdown's want to:

- reflect stakeholder expectations in improvement of Ravensdown's environmental impact.
- achieve a long term consent with appropriate conditions.
- complete projects that balance environmental and business sustainability.
- renew and enhance Ravensdown's position in the **community** through meaningful and transparent engagement.

Determination of Quality Targets

- Discharge and receiving environment information from subject matter experts
- Benchmarking against International Best Practice
- New Zealand Guidelines and Standards in a range of planning documents including the HBRC science position on the TANK Plan Change
- Listening and responding to community opinion and expectation, including the TFG

In order to achieve the objective we set for ourselves, we need to set targets for our discharges.

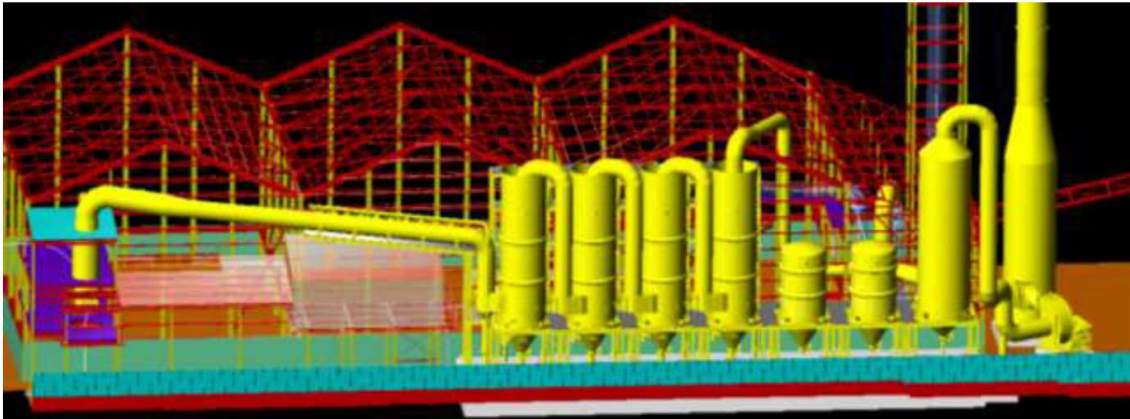
Baseline studies – what effects are we currently having on the surrounding environments? Completed by subject matter experts – estuary, public health, plant health – and reports shared on the webpage. Predominantly assessed as minor impact.

International Best Practice – what are other similar sites achieving around the world, and how? Part of studies completed by Chemetics and JESA – international companies with a lot of relevant experience.

Legislative requirements – what is the “bottom line”? Things like national standards and the proposed TANK plan change.

Community expectations – TFG guidance and feedback.

Air - Fluoride



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Fluoride gases are released during the fertiliser manufacturing process

Best practice is defined as 5mg F per cubic m of air flow. Agreed number from International Fertiliser Association and the World Bank.

Ravensdown's current fluoride emissions are in line with IBP, and the new scrubbing system design will achieve similar F removal. Number of 'transfer units', or ability to capture fluoride, is the same.

Better and more robust scrubber design means we are confident in being able to reduce our limit to 1.0kg F per hr. This represents a 33% reduction in the mass limit for F discharges.

Taller stack will generate lower ground level concentrations through better dispersion – lower public exposure.

Air – SO₂



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Sulphur dioxide mainly comes from the acid manufacturing process.

IBP is based on a double absorption plant, which is the design we have. Within that SO₂ discharge rate is a sliding scale based on rate of acid production.

Ravensdown are replacing the converter as part of an ongoing project. As part of that a decision has been made to increase the size of the converter. Increasing the volume of catalyst will bring us in line with best practice.

This means Ravensdown can confidently lower the SO₂ rate limit to 40kg per hour, which again represents a 33% reduction in the mass limit against the current conditions.

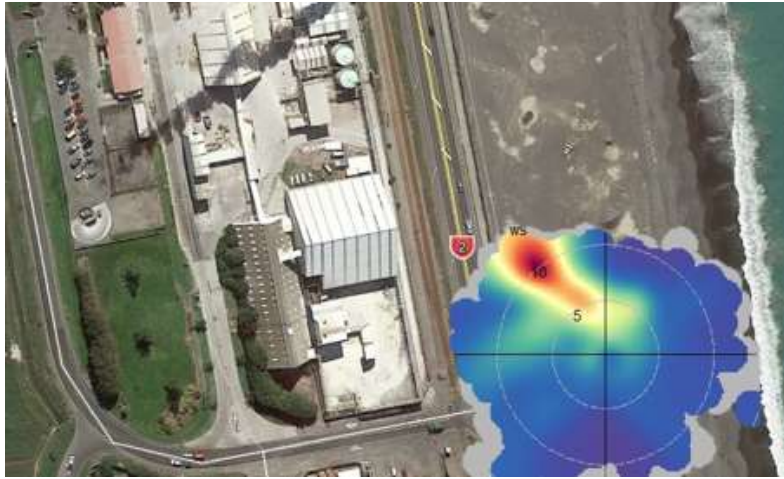
Installing a larger converter will lower the day-to-day mass of SO₂ emitted.

Ravensdown have completed an investigative stack test and confirmed that SO₂ is emitted from the manufacture stack.

It is a very small dataset, and Ravensdown can't be sure that we fully understand it. At the moment we believe it is influenced by rock type. All rocks contribute, but some more than others.

We are propose we include in the consent with a “starting point” of 10kg per hour while we learn more.

Air – Particulate



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Particulate – PM 10 – is measured in the stacks from the four grinding mills. Best practice for this type of discharge is 50mg per m³. Ravensdown’s current consent conditions are in line with best practice, and we are achieving in line with the conditions.

Advice has been provided on how we could improve the stack design to get better dispersion, and therefore reduce effects. Ravensdown are considering this advice.

Dust, including PM10 is also a fugitive issue for site. We are doing a lot of work with our recorded PM10 monitoring and wind data to see whether we can determine contributors to this.

This will be a key “work-on” for Ravensdown in the Source Control Management Plan.

Air – H₂S



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Hydrogen Sulphide is released from the imported S during the melting process. Can create a 'rotten egg' smell in larger quantities.

Ministry for Environment health based guideline is set at 7µg per cubic m. As a condition of our current consent Ravensdown periodically monitor against this.

Ravensdown are completing sampling from our stacks and some modelling to learn, and determine how best to deal with it. Currently there is no "forced extraction" from the vessels, just chimneys on top of the tanks.

A better solution could look like installing a fan and taller stack to get some dispersion, or a simple scrubbing system.

Ravensdown already specify "degassed" sulphur when we are buying, meaning we are minimising any potential issue.

Water - Overview



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As mentioned previously, the baseline effects report from Steamlined Environmental showed “minor” effects to estuary from our current discharges. It is a complicated analysis due to the multiple discharges in the area.

Ravensdown have considered the results of the Multi Criteria Decision Analysis, and the feedback we received from the community and mana whenua groups.

Ravensdown are proposing to progress on an “adaptive management” basis. What this means in practice is we will improve water quality over time towards a stated end goal. Improvements are based on increasing knowledge of the system and testing results.

We will also continue monitoring of the estuary environment to gauge what effect the improvements are having, and how the ecosystem is changing.

Water – Treatment Schematic



This represents an idea of what the treatment and discharge solution may look like.

It starts with treating issues in the areas they arise. This is obviously more effective and economic. Specific treatment for nitrogen at despatch, maybe a bioretention device. Treating phosphorus and fluoride coming from manufacture and rock storage using a precipitation clarifier.

After feedback from the group, Discharge to Land is Ravensdown's preferred option. We have engaged a team of experts to help us understand how we can achieve this with precision irrigation to the farm land we own.

There is a dotted line to the estuary discharge still. Ravensdown need to retain a "plan B" for discharges during wet periods or high volume rainfall events that could potentially overwhelm the system.

When we do discharge to the estuary, we will time it with a falling tide to maximise the available dilution.

We would be able to add treatment "building blocks" over time. Ravensdown would commit to Step One, and the endpoint. We would then be able to monitor the improvements, and determine what further treatment steps will look like when we understand what they need to achieve. Long term targets for water quality remain throughout.

Water Quality Targets

PARAMETER	CURRENTLY MEASURED	EXISTING CONSENT CONDITIONS	PROPOSED QUALITY CONDITIONS ⁶⁷	RATIONALE
Total P	Yes Weekly discharge composite sample	95% - 17 mg/L 99% - 22 mg/L	Discharge concentration of 0.196 mg/L	Proposed condition aligns with community expectations as outlined in the relevant national and regional planning documents.
Soluble Reactive P	Yes Weekly discharge composite sample	95% - 15 mg/L 99% - 20 mg/L	Discharge concentration of 0.074 mg/L	Proposed condition aligns with community expectations as outlined in the relevant national and regional planning documents.
Fluoride	Yes Weekly discharge composite sample	Maximum 30 mg/L	Discharge concentration of 24.5 mg/L	Proposed condition aligns with community expectations as outlined in the relevant national and regional planning documents.
Total Nitrogen	Yes One week composite per month	Not considered	Discharge concentration of 0.539 mg/L	Proposed condition aligns with community expectations as outlined in the relevant national and regional planning documents.

Water quality targets have largely been developed from the notified TANK schedule for Waitangi Estuary. Ravensdown have included dilution from Streamlined Environmental's dye study to determine what our discharge quality would need to be. This is a much lower factor than previous studies had allowed for.

Ravensdown are proactively adding nitrogen into routine analytes. Believe this is in line with Ravensdown's values and the project objectives.

Water Quality Targets

PARAMETER	CURRENTLY MEASURED	EXISTING CONSENT CONDITIONS	PROPOSED QUALITY CONDITIONS ⁶⁷	RATIONALE
Ammoniacal Nitrogen	Yes One week composite per month	Not considered	Discharge concentration of 0.49 mg/L	Proposed condition aligns with community expectations as outlined in the relevant national and regional planning documents.
Nitrate-Nitrogen	Yes One week composite per month	Not considered	Discharge concentration of 0.245 mg/L	Proposed condition aligns with community expectations as outlined in the relevant national and regional planning documents.
pH	Yes Weekly discharge composite sample	6.5-8.5	7.0-8.5	Proposed condition aligns with community expectations as outlined in the relevant national and regional planning documents.
Suspended Solids	Yes Weekly discharge composite sample	Maximum 100 mg/L	Discharge concentration of 100 mg/L	Existing conditions are already in line with TANK requirements.

pH range changes slightly and suspended solids cap remains the same. These conditions were already in line with the expectations of TANK.

Ravensdown are still investigating what water quality would be required for discharge to land. It may be the same, or slightly different.

Source Control Plan



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Ravensdown will be submitting a Source Control Management Plan as part of their application. The plan will relate to both fugitive air emissions, and will influence how much nutrient loading enters the site water.

Ravensdown will write a comprehensive plan with our technical experts. It will contain specific actions, and timeframes for completing them.

Habitat Abundance Restoration Project




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Further to Ravensdown's strategies to improve our discharges, we are looking to partner in the improvement of Waitangi Regional Park. Ravensdown have listened to the concerns about a lack of abundance in the ecosystem, and want to be part of that restoration.

This will be a long term commitment to a project. We have approached HBRC to try and define what the project would look like, and will include the details in our application.



Thank you again for listening.

Ravensdown welcomes any questions, comments and feedback on the proposed strategies.



RESOURCE CONSENT RENEWAL PROJECT

TECHNICAL FOCUS GROUP

Meeting 4
27 Aug 2021



Draft Scopes of Assessment Reports

Short Title	Author (s)	Organisation	Scope
Planning Assessment	Philip McKay Mason Jackson	Mitchell Daysh Mitchell Daysh	<ul style="list-style-type: none"> Assessment of national, regional and district planning documents to ascertain key policies and activity status for the project as set out in the Discharge Strategies and Project Description.
DSI HAIL Report(s)	Nikki Mather Emma Lewis	Beca Beca	<ul style="list-style-type: none"> Detailed assessment of any contaminated land under the NES (Assessing and Managing Contaminants in Soil to Protect Human Health) where treatment infrastructure is proposed.
Air Quality Effects	Richard Chilton	Tonkin + Taylor	<ul style="list-style-type: none"> Assessment of site point source air discharges and fugitive emissions based on air dispersion modelling and other techniques. Comparison of discharges to relevant air quality guidelines and standards with the modelling results and proposed consent conditions.
Human Health Effects	Francesca Kelly	Environmental Medicine Ltd	<ul style="list-style-type: none"> Assessment of public health risks associated with site air and water discharges based on the Discharge Strategies. Advice on public health risks of fluoride in mahinga kai (traditional food resources) (see Vegetation Effects).
Vegetation Effects	Stephen Trolove	Plant & Food	<ul style="list-style-type: none"> Develop and undertake a study of selected mahinga kai (traditional food resources) to advise the public health risk assessment of fluoride in conjunction with Mana Whenua. Assessment of effects on sensitive vegetation and crops within the modelled air dispersion area based on the Air Discharge Strategy.

Draft Scopes of Assessment Reports

Short Title	Author (s)	Organisation	Scope
Cultural Values Effects (x2)	Chad Tareha Tania Eden	Ngāti Pārau Te Taiwhenua o Te Whanganui ā Orotu	<ul style="list-style-type: none"> • Provide an overview of the cultural values in the area around the site (including the Tutaekuri River, Waitangi Estuary, Coast, and land). • Prepare a cultural values assessment in relation to the Ravensdown resource consent renewal project in terms of the outcomes of the Water and Air Discharge Strategies. • Provide input to and comment on Waitangi Estuary Habitat Abundance Restoration Project (HARP).
Economic Assessment	Sean Bevin	Economic Solutions	<ul style="list-style-type: none"> • Prepare an economic assessment of the Ravensdown Napier operation in a regional and national context and the associated economic impact / benefits of the site operations.
Estuarine Ecology Assessment	Ngairie Phillips Mike Stewart Sharon DeLuca	Streamlined Environmental Ltd	<ul style="list-style-type: none"> • Assessment of effects of site stormwater and process water discharge(s) on the estuarine environment based on the staging set out in Table 1 of the Water Discharge Strategy. • Consideration of adaptive management plan and associated discharge targets in relation to the proposed implementation timeframe. • Provide advice on the Waitangi Estuary Habitat Abundance Restoration Project (HARP) in collaboration with the TFG members.

Draft Scopes of Assessment Reports

Short Title	Author (s)	Organisation	Scope
Land Discharge Effects and Management	Alexandra Johansen	Bay Geology	<ul style="list-style-type: none">• Assessment of hydrogeology in the area of the proposed discharge and the Napier Source Protection Zone.• Provide advice regarding risks of a land discharge in relation to the groundwater quality and the Napier Source Protection Zone.
	Ant Roberts Mike Wright	Ravensdown Ravensdown	<ul style="list-style-type: none">• Assessment of soil chemistry and plant uptake of discharge water on Ravensdown land.
	Ian Milner	Land Vision	<ul style="list-style-type: none">• Provide advice on the irrigation requirements and cropping to ensure maximum uptake of the water into crops.

Draft Scopes of Management Plans

Short Title	Author (s)	Organisation	Scope
Source Control Management Plan	Helen Caley Richard Chilton Andrew Torrens	Aurecon Tonkin + Taylor Ravensdown	<ul style="list-style-type: none"> Implementation plan to control fugitive emissions and discharges (air and water) including site housekeeping measures and structural modifications.
Adaptive Management Plan	Helen Caley Andrew Torrens	Aurecon Ravensdown	<ul style="list-style-type: none"> Outlining the processes over time for implementing the discharge conditions set out in the Table 2 of the Water Discharge Strategy using appropriate monitoring and trigger points following the measures outlined in Table 1 of the Water Discharge Strategy.
Waitangi Estuary Habitat Abundance Restoration Plan (HARP)	Anita Anderson Andrew Torrens TFG Working Group Members HBRC	Mitchell Daysh Ravensdown	<ul style="list-style-type: none"> Development of an abundance restoration management plan for a defined area of the Waitangi Regional Park next to Ravensdown owned land. It is envisaged that this will require a working group to be set up involving HBRC Regional Parks personnel, relevant ecological experts and interested members of the TFG.

Timeline to Lodgement of Application

Task	Due Date
<i>TFG MEETING 4</i>	27 Aug 21
Final Key Reference Reports (Baseline Reports, Discharge Strategies)	3 Sept 21
Draft Assessment Reports	24 Sept 21
Draft Management Plans	1 Oct 21
<i>TFG MEETING 5</i>	1 Oct 21
Final Assessment Reports	8 Oct 21
Final Management Plans	15 Oct 21
Draft Resource Consent Applications and AEE	29 Oct 21
Final Resource Consent Applications and AEE (for Ravensdown approval)	12 Nov 21
FINAL DATE FOR LODGEMENT	30 Nov 21