

30th April 2020

Ravensdown Limited
C/- Helen Hurring
Private Bag 6012
Napier 4142

Reference: **AUTH-115256-03**

Attention: Helen Hurring, Helen.hurring@ravensdown.co.nz

Dear Helen

COMPLIANCE MONITORING REPORT

Consent number:	AUTH-115256-03 (Please note this number replaces your historic number)
Historic number:	DP050561Ab

Hawke's Bay Regional Council has completed the Compliance Monitoring Report for above Resource Consent.

THIS REPORT APPLIES TO THE PERIOD: 1st July 2018 to 30th June 2019

YOUR CURRENT COMPLIANCE GRADE IS: Moderate Non-Compliance

THE FOLLOWING ACTION MUST BE TAKEN BY YOU:

Action:	Timeframe:
Provide further details confirming the second location of ambient SO2 monitoring	28-04-2020 - 30-05-2020

Under Section 36 of the Resource Management Act 1991 you will be charged for the actual and reasonable costs involved in monitoring the resource consent. The account will be sent to you in due course.

Please contact me should you have any questions.

Yours sincerely



Jack Blunden
Environmental Officer Compliance
Regulation Group
Phone (06) 833 8030
Email: jack.blunden@hbrc.govt.nz

HAWKES BAY REGIONAL COUNCIL: STATEMENT OF COMPLIANCE AND OVERALL GRADE

CONSENT HOLDER	Ravensdown Limited	CONSENT NUMBER	AUTH-115256-03
CLIENT ADDRESS	C/- Helen Hurring Private Bag 6012 Napier 4142	SITE ADDRESS	90 Waitangi Road, Awatoto, Napier,
JOB CODE	456007	CONSENT TYPE	Resource Consent

ACTIVITY DESCRIPTION

To discharge contaminants into the air from the operation of the company's fertiliser manufacturing plant at Awatoto, including the following processes:

- The manufacture of sulphuric acid,
- The manufacture of superphosphate fertiliser,
- The storage, blending and dispatch of bulk and bagged fertilisers and sulphuric acid,
- The receipt and storage (inside and outside) of raw materials and imported fertiliser,
- General site operations

OVERALL COMMENT

This compliance report covers the period 01/07/2018 to 30/06/2019.

A site visit was made on the 24/09/2018.

This report highlights some moderate and low risk non-compliance with the conditions of this consent as detailed below

- Condition 3 is graded moderately non-compliant due to two exceedances of the PM10 NES limit.
- Condition 37 is graded moderately non-compliant for three exceedances of the hygiene stack condensate pH limit during September, October and November 2018.
- Condition 44 is graded low risk non-compliant due to the external audit identifying issues with some analyses completed by the consent holder. These have since been addressed according to the agreed action plan.
- Condition 49 is graded low-risk non-compliant as soluble fluoride instead of total is being measured in the manufacture stacks monitoring.
- Condition 58 is graded low risk non-compliance as the PM10 exceedances are not reported to Council as soon as they are known but instead submitted with the monthly data.

The Council acknowledges the improvements made by the consent holder during the 2018/2019 compliance period which is reflected in the improved compliance grading for the consent. The identified non-compliance relates to discrete events during the compliance period and the non-compliance from previous periods has been addressed. However, Council has particular concern with the elevated PM10 readings relating to the consent holders operation. Further mitigation measures need to be put in place to minimise the particulate emissions from site.

Consent Conditions and Compliance Assessment

NO:	CONSENT CONDITION:	COMPLIANCE GRADE:	COMMENTS:
1.	All works and structures relating to this resource consent shall be designed and constructed to conform to the best engineering practices and at all times maintained to a safe and serviceable standard.	Full Compliance	All works and structures onsite appeared to be well maintained. During the 2019 shutdown period repairs were undertaken to extend the boiler stack to the required height, install an automatic deluge system in the manufacturing plant. Additional upgrades to the scrubber system is expected over the next few years to combine the hygiene and manufacture stacks into one.

2.	The consent holder shall undertake all operations in accordance with any drawings, specifications, statements of intent and other information supplied as part of the application for this resource consent. If a conflict arises between any conditions of this consent and the application, the conditions of this consent will prevail.	Full Compliance	During the site visit all operations were seen to have been undertaken in general accordance with the conditions of this resource consent. Any major changes to processes have been done with prior approval of Council.
3.	There shall be no discharge of particulate matter (including dust) that causes an offensive or objectionable effect beyond the boundary of the site. Compliance with Conditions 6 to 13 does not automatically result in compliance with this condition.	Moderate Non-Compliance	<p>During the site visit there was evidence of particulate matter discharge beyond the boundary of the site. During the compliance period there have been multiple exceedances of the NES Air quality limit of 50ug/m³ 24 hour average.</p> <p>Two particular exceedances on the 3/12/2018 and 11/02/2019 were also recorded at the HBRC air quality monitoring station. The December 2018 exceedance contained a high proportion of calcium sulphate and the February 2019 exceedance was predominantly phosphorus. Both of these have been attributed to the Ravensdown operation. The exceedance of PM₁₀ in the Awatoto airshed is of particular concern to Council as it is the only airshed in Hawkes Bay that breaches the NES standards. Extra efforts need to be taken to reduce dust and particulate emissions from the site.</p> <p>There have been no complaints received regarding operations during this compliance period.</p>
4.	There shall be no discharge of odour that causes an offensive or objectionable effect beyond the boundary of the site.	Full Compliance	There have been no odour complaints received regarding the operations of this consent during this compliance period.
5.	Notwithstanding any other condition of this consent, there shall be no noxious or dangerous levels of gases, airborne liquid or other airborne contaminants beyond the legal boundary of the site, that are likely to cause adverse effects on human health, ecosystems or property. [Note: for the purpose of this condition the term 'property' shall mean 'land and all assets on it'].	Full Compliance	During the compliance period there have been no complaints regarding noxious or dangerous gases beyond the boundary of the site. Ambient air quality monitoring has not indicated any exceedances of the consented limits beyond the boundary of the site.
6.	All bulk raw materials stored on site shall be kept in enclosed buildings, with the exception of phosphate rock which must otherwise be securely contained to minimise particulate being discharged into air.	Full Compliance	All bulk raw materials are stored within covered and contained buildings. There has not been any outdoor storage of phosphate rock during the compliance period.
7.	The consent holder shall use its best endeavours to avoid outside storage of phosphate rock. Any outside storage shall be undertaken in accordance with the Investigation and Management Plan, as required by Condition 67 of this consent. Outside storage, excluding the management of spills, shall only be undertaken in the area to the south of the Acid Plant.	Full Compliance	During the compliance period there has not been any outdoor storage of phosphate rock.
8.	<p>At least 10 working days prior to the use of outside product storage the Consent Holder shall notify the Council that product shipments will be arriving which cannot be stored inside. Notification shall include the following:</p> <p>a. A summary of why alternative covered storage is not possible and</p> <p>b. The product type to be stored outside and</p>	Full Compliance	During the compliance period there has not been any outdoor storage of phosphate rock.

	<p>c. The likely volume of product to be stored outside and</p> <p>d. The estimated date of arrival and the time it will take to place product at the outside location and</p> <p>e. Estimated duration that the product will be stored outside.</p>		
9.	No outside unloading, pile forming or loading shall occur when average hourly wind speed exceeds 5 metres per second (m/s). The wind speed shall be determined by an onsite meteorological station in accordance with Condition 42 of this consent.	Full Compliance	Unloading takes place within a covered unloading area. During the compliance period there has not been any outdoor storage of phosphate rock.
10.	The consent holder shall carry out the suppression of dust with use of water through various methods that include, but are not limited to, spraying with water cart or sprinkler system to minimise the discharge of all visible dust beyond the site boundary, particularly during the loading, transfer and stockpiling of product. The control of dust discharges from stockpile areas shall include night-time and weekend hours.	Full Compliance	<p>Dust suppression on site is used when necessary and regular sweeping of the yard is undertaken as needed to reduce dust emissions. At the time of the site visit, the yard area was well maintained and little dust was evident.</p> <p>During the compliance period there have been several exceedances in PM10, additional dust suppression should be employed during loading/unloading and during periods of high wind in order to reduce potential dust emissions from site.</p>
11.	Notwithstanding Condition 10 the consent holder shall establish and maintain an automated dust suppression sprinkler system that covers all outside storage piles, except for the working face while being worked, which will activate and remain operational for the duration of outside product pile storage, including unloading and loading. The sprinkler system shall have a capacity in terms of volume and layout that will ensure adequate dampening down of the stockpile in all possible wind conditions.	Full Compliance	During the compliance period there has not been any outdoor storage of phosphate rock requiring a sprinkler system.
12.	The consent holder shall ensure regular sweeping of yard and road areas using mechanical cleaning to minimise dust emissions.	Full Compliance	Weekly sweeping of the site is undertaken and additionally when required to minimise dust build up.
13.	The consent holder shall ensure that the product storage pile does not exceed 4 metres in height.	Full Compliance	During the compliance period there has not been any outdoor storage of phosphate rock.
14.	Except for discharges from the auxiliary boiler, furnace stack, economiser stacks and other minor vents, all discharges from the acid plant shall be via an emission stack with a height no less than 55 metres above ground level.	Full Compliance	Discharges from the acid plant are via an emission stack no less than 55m above ground level as required by this condition.
15.	The emission rate of Sulphur Dioxide (SO ₂) measured by continuous monitoring in the acid plant stack shall not exceed 1.5 kilograms (kg) per minute (two minute average) and 60 kg/hour (one-hour average) at any time.	Full Compliance	The emission rate of sulphur from the acid plant stack is continuously measured and has not exceeded the 1.5kg/min or the 60kg/hour limit for the compliance period.
16.	Notwithstanding Condition 15, the combined discharge rate of SO ₂ , Sulphur Trioxide (SO ₃) and Sulphuric Acid (H ₂ SO ₄) from the sulphuric acid production process shall not exceed 60 kg/hr, expressed as SO ₂ .	Full Compliance	Both monthly data, and data submitted with the annual report shows that the combined discharge rate for SO ₂ , SO ₃ and H ₂ SO ₄ has been less than 60kg/hour during the compliance period.
17.	<p>An Acid Plant cold start up sulphur ignition shall not occur:</p> <p>a. between the hours of 1:00 am and 10:00 am on clear still mornings when the wind speed is less than 2 m/s and there is no cloud and</p> <p>b. when the wind direction is between 030 and 155 degrees (onshore winds).</p>	Full Compliance	An acid plant cold start occurred in August 2018. The acid plant start up report provided shows compliance with the conditions listed.

	<p>Note: For the purposes of this consent, an acid plant cold start refers to starting the acid plant from cold, this occurs following a complete shutdown when the acid plant is starting from ambient temperatures and diesel is used to pre-heat the plant. An acid plant warm start refers to starting the acid plant when the plant is already warm, this occurs following a short plant stop, usually less than 8 hours, when the temperature in the acid plant has been maintained above a critical limit.</p>		
18.	<p>Subject to condition 21, the combined discharge rate of SO₃ and H₂SO₄ (expressed as SO₃) from the sulphuric acid production process shall not exceed:</p> <p>a. 2 kg/hr as a 1-hour average at any time</p> <p>b. 0.5 kg/hr for at least 50% of fixed 1-hour averages in any 3 month period.</p>	Full Compliance	During the compliance period continuous measurement of combined SO ₃ and H ₂ SO ₄ emissions from the acid plant has not exceeded the 1 hour average or the 3 month average.
19.	<p>The existing final acid plant absorbing tower shall be replaced with a new tower containing a high efficiency distribution system, high efficiency packing and high efficiency mist eliminators that reduces the acidity of emissions from the acid plant to ensure compliance with the conditions of this consent at all times. The new tower shall be installed and commissioned by 30th October 2012. A suitably qualified independent person approved by Council shall certify in writing that the new absorbing tower, as installed and operated, is capable of meeting the conditions of this consent. This certification shall be provided to the Council by 30th November 2012.</p>	Not Applicable	This condition is historical.
20.	<p>The discharge from the acid plant stack shall be clear at all times, except that a visible white plume may occur within four hours of igniting sulphur in the case of a cold start up and within one hour in the case of a warm start up.</p>	Full Compliance	Council has received no complaints regarding vapor emissions from the activities of this consent. A method for monitoring opacity is currently in place and further developments are planned to increase its usefulness. No visible plume was observed during the August 2018 cold start up.
21.	<p>The discharge from the acid plant may contain up to 150 milligrams per cubic metre (mg/m³) at NTP SO₃ / H₂SO₄ expressed as SO₃ for not more than 4 hours after igniting sulphur in the case of a cold start and not more than 1 hour in the case of a warm start up. This shall be measured in accordance with USEPA method 8 or another method as approved by Council.</p>	Full Compliance	Acid plant cold starts and regular operation of the acid plant show SO ₃ /H ₂ SO ₄ concentrations well within the consented limits for the compliance period.
22.	<p>The discharge from the acid plant shall not occur during wind directions between 030 and 155 (onshore winds) between the months of September to May inclusive, when either of the following meteorological conditions occur</p> <p>a. The relative humidity measured on-site at 10 metres above ground level is 92% or greater, wind speed at 10 metres above ground level is 3 m/s or less and it is not raining or</p> <p>b. The relative humidity measured on-site at 10 metres above ground level is 95% or greater, wind speed at 10 metres above ground is greater than 3 m/s and it is not raining.</p> <p>Acid plant discharge shall cease within 30 minutes of the above meteorological conditions being detected and shall not recommence until these conditions have not occurred for a period of at least 30 minutes. Plant operators shall be alerted when the measured relative humidity at 10 metres above ground during onshore winds (030-155 degrees) exceeds 90%, and careful observation of meteorological conditions and the visible plume discharge shall occur during such conditions. A record shall be kept of the dates, time periods and meteorological conditions</p>	Full Compliance	Meteorological conditions are constantly monitored by operators and automatically alarm when the wind and humidity conditions described occur. Records of meteorological conditions and time periods for shutdown are recorded and submitted to Council with the monthly data report. A full record is supplied with the annual report in October.

	when the acid plant operation ceases according to this condition. This record shall be provided to the Council on request and otherwise annually.		
23.	A system shall be installed that automatically shuts off the sulphur feed to the burner so that the discharge to air rate of SO ₂ , SO ₃ and H ₂ SO ₄ from the sulphuric acid production process does not exceed Conditions 15 and 16.	Full Compliance	A system is in place to automatically shutdown the sulphur feed if discharge limits are neared to ensure compliance. This is especially important during cold starts which are closely monitored and reported on. There have been no exceedances during the compliance period.
24.	<p>a. The consent holder shall install and operate at least two ambient SO₂ monitors around the acid plant in order to detect fugitive SO₂ emissions. The monitoring sites shall be located at or about the southern boundary of the "Winstones" site, as described in Condition 57, and at or about the engineering store compound, to the western side of the acid plant. The concentration of SO₂ in ambient air shall be monitored continuously (at least every minute) by UV fluorescence analysis or an alternative method agreed to in writing by the Council and</p> <p>b. In the event that ambient concentrations of SO₂ measured at either the monitoring sites described by Condition 24(a) or the monitoring site described by Condition 57 exceed 350 µg/m³ as a 10-minute average, immediate action shall be taken to ensure that measured SO₂ concentrations are reduced to less than 350 µg/m³ as a 10 minute average. A record shall be kept of all occurrences when measured SO₂ concentrations exceed this limit and the corrective action taken. This record shall be provided to the Council on request and otherwise annually.</p>	Full Compliance	Two ambient SO ₂ monitors are operated on behalf of the consent holder by Water Care Laboratories at the Archimedes and Winstones monitoring sites. There have been no exceedances of the ambient SO ₂ during the compliance period.
25.	Discharge from the Auxiliary Boiler shall be via an emission stack of 15.8 metres above ground level.	Full Compliance	Works were undertaken during the period to increase the stack height to the required 15.8m. As built plans and a producer statement have been received confirming the height.
26.	The diesel oil burning rate in the auxiliary boiler shall not exceed 580 litres per hour.	Full Compliance	The diesel fired burner is only capable of combusting a maximum of 430l/hour as stated in the manufacturers specifications.
27.	The auxiliary boiler and the pre-heater shall only burn diesel oil having a maximum sulphur content of 0.005% by weight. Documents showing fuel analysis shall be provided to the Council on request.	Full Compliance	Diesel fuel used has a maximum sulphur content of less than 0.005% by weight. This is an industry standard for diesel fuels and testing is undertaken by the provider. Please ensure that fuel analysis detailing sulphur content is kept and reported in the annual report.
28.	The opacity of emissions from the auxiliary boiler and pre-heater stacks shall not be darker than Ringelmann Shade 1 as determined in accordance with the New Zealand Standard 5201:1973, except for a period not exceeding 2 minutes in each hour of operation.	Full Compliance	The consent holders laboratory staff have completed Ringelmann tests at the time of each cold start. Cold start reports supplied indicate that the opacity of the discharge was not darker than Ringelmann Shade 1.
29.	The concentration of hydrogen sulphide (H ₂ S) shall be measured in accordance with Condition 50 and shall not exceed 7 µg/m ³ (with a 1 hour averaging time) in the ambient air at or beyond the boundary of the premises as a result of emissions from the consent holder's property.	Full Compliance	<p>H₂S monitoring was carried out in June and July 2019 by the consent holder using monitoring stations set up by Watercare Services Limited.</p> <p>H₂S monitoring was previously undertaken by the Council but is now completed by an IANZ accredited</p>

			contractor on behalf of the consent holder.
30.	Discharges from each den scrubber shall be via stacks with a height of no less than 38 metres above ground level.	Full Compliance	No changes have been made to the scrubber stack during the compliance period. The stack is of the required height.
31.	Discharges from the hygiene scrubber shall be via a stack with a height of no less than 36 metres above ground level.	Full Compliance	No changes have been made to the hygiene stack during the compliance period. The stack is of the required height.
32.	All emissions from the superphosphate manufacturing process shall be discharged through either the den stacks or the hygiene stack. Within 12 months of the commencement of this consent a report shall be provided by an independent suitably qualified person (approved by the Council) that certifies that all necessary remedial work to the ventilation and extraction system has been undertaken such that fugitive contaminant emissions from the manufacturing plant building have been eliminated as far as practicably possible. This ventilation and extraction system shall be maintained and operated at all times during the manufacturing of superphosphate.	Full Compliance	All emissions from the manufacturing process are discharged through the den or hygiene stacks as per this condition.
33.	The 7-day average concentration of fluoride measured at the RFC SW monitoring site (location as detailed in Condition 54), shall not exceed 1.7 µg/m ³ .	Full Compliance	During the compliance period, the ambient fluoride measured at the RFC SW site has been below the 1.7µg/m ³ limit.
34.	The 7-day average concentration of fluoride measured at the RFC NW monitoring site (location as detailed in Condition 54), shall not exceed 5.5 µg/m ³ .	Full Compliance	During the compliance period, the ambient fluoride measured at the RFC NW site has been below the 5.5µg/m ³ limit.
35.	The rate of particulate matter discharged from any Bradley mill shall not exceed 1 kg/hr per mill, and 2 kg/hr in total when two or more mills are in operation.	Full Compliance	The rate of particulate matter discharged from any single mill reached a maximum of 0.191kg/hr during the compliance period. The maximum combined discharge from all three operational mills was 0.2kg/hr. Mill 5 has not been used during the compliance period as it has been decommissioned for repairs.
36.	The sum of the fluoride compounds discharged from the den stacks and the hygiene stack measured in the samples taken in accordance with Condition 49 expressed as fluoride on a one hour average basis, shall not exceed: a. a maximum discharge rate of 1.5 kg/hr and b. 1 kg/hr in more than 50% of samples taken in any 12-month period	Full Compliance	The sum of fluoride compounds discharged from the den and hygiene stacks did not exceed the 1.5kg/hr or 1kg/hr 12 month average limits for the compliance period. All testing was done in accordance with the requirements of condition 49.
37.	A treatment system that reduces the acidity of emissions from the manufacturing plant shall be installed such that after 3 months from the commencement of this consent the pH of the condensate from the den and hygiene stacks shall be no lower than 2.7. The method by which the condensate is to be measured shall be approved in writing by the Council.	Moderate Non-Compliance	Emission tests undertaken in September, October and November 2018 on the hygiene stack returned pH readings of 2.66, 2.57 and 2.66 respectively. These are all below the 2.7 pH limit and is graded moderately non-complaint. The consent holder increased the dosage in the hygiene stack and no further exceedances have been reported. All emission tests from the den stack and other tests from the hygiene stack were within the require limits.

38.	<p>An automated water deluge system for the manufacturing den mixer shall be installed and maintained such that contaminant discharges are prevented in the event of failure of the mixing process.</p>	<p>Full Compliance</p>	<p>An automated water deluge system is installed at the den mixer as required. Photos of the automated system have been provided.</p> <p>The valve is programmed to trigger when the opacity meter is greater than 80% for more than 5 seconds or if the temperature difference between the hood and the room is greater than 10% for more than 3 seconds.</p> <p>If these conditions are exceeded then this will trigger a major alarm, initiate a powder flush of the mixer and trigger the automated valve to open for 40 seconds.</p>
39.	<p>Until such time as the pH of the discharge from the manufacturing plant is consistently above 2.7, as required by Condition 37, when the wind speed at the site is no more than 3 m/s and the wind direction is between 030-155 degrees (i.e. on-shore) the manufacture of fertiliser shall only occur when either:</p> <p>a. the temperature at the site is less than 22 C and</p> <p>b. the manufacturing stack plume is "OK" as indicated in the chart attached as Appendix "A".</p> <p>OR</p> <p>c. the temperature at the site is 22 C or more and</p> <p>d. it is daylight and</p> <p>e. the relative humidity at the site is less than 70% and</p> <p>f. there is no fog and</p> <p>g. the manufacturing stack plume is 'OK' as indicated in the chart attached as Appendix "A".</p> <p>The time and duration of manufacturing plant stoppages due to meteorological conditions shall be recorded. These records shall be provided to the Council on request.</p>	<p>Full Compliance</p>	<p>The pH of the manufacturing plant is managed effectively through an automated dosing system. The consent holder has a program to manage the process should the listed conditions occur while the dosing system is offline.</p>
40.	<p>The concentration of fluoride in ambient air measured in accordance with Condition 54 shall not exceed 0.8 µg/m³ (7 day average) at areas used for horticultural production (including Brookfields Orchard and Plumpton Park (locations as detailed in Condition 54)).</p>	<p>Full Compliance</p>	<p>The fluoride levels in ambient air are measured in Brookfields Orchard and Plumpton Park. The reported samples have not exceeded 0.13ug/m³ during the compliance period.</p>
41.	<p>The evaporative cooling towers shall be regularly dosed with micro-biocides to maintain the concentration of the micro-biocide in the cooling water at the level recommended by the supplier that prevents the establishment of Legionella bacteria. Records shall be kept to demonstrate compliance with this condition and shall be provided to the Council on request.</p>	<p>Full Compliance</p>	<p>The evaporative cooling towers are regularly dosed with micro-biocides to prevent Legionella establishment. Records of Legionella and heterotrophic plate counts are provided in the monthly reports. The samples do not indicate any Legionella presence during the compliance period.</p>
42.	<p>The consent holder shall operate a meteorological data collection station in a location that reasonably represents meteorological conditions on the site. The station shall continuously record, wind speed, wind direction, temperature and relative humidity, and display them in real time in the manufacturing control room and the acid plant control room. The site location and the resolution, accuracy and averaging time of monitoring equipment shall be</p>	<p>Full Compliance</p>	<p>The consent holder operates a meteorological data collection station at the Winstones monitoring site as well as at the acid control tower. Wind speed, direction, temperature and relative humidity are recorded and displayed in both the manufacture and acid plant control rooms. This information is</p>

	agreed in writing by the Council. All processed data shall be archived and made available to the Council on request.		reported monthly to Council and summarised in the annual report.
43.	All sampling and surveys shall be carried out by an independent suitably qualified person, or by the consent holder or its representative where the Council has agreed to this in writing. Where the consent holder or its representative carries out testing or monitoring, an independent suitably qualified person shall audit the monitoring and testing methodology at least once per year, unless otherwise agreed in writing by the Council, and shall provide a written report describing the extent of compliance with the required protocol. A copy of this report shall be provided to the Council.	Full Compliance	<p>The audit was undertaken by K2 Environmental in May 2019 for the processes that Ravensdown carry out themselves. A copy of the report was provided to Council. This report has not been undertaken since 2017 and highlights some issues as detailed below. Ravensdown have addressed the major issues raised and have an action plan in place to bring all processes up to the required standards. The report details the compliance and non-compliances in the required protocols. The main non-compliances are</p> <ul style="list-style-type: none"> - Manufacture stacks are only sampled for soluble fluoride due to the equipment and methods, total is required (page 9). - SO2 analysis may be compromised because of incorrect leak check procedures (page 11). - No calibrations of the lab glassware (page 4). - No staff training records (page 2). - Potentially miscalculated results (page 2). - Gas flow analysis SOPs are not fit for purpose (page 6). - pH results of the manufacture stack may be affected by the use of a metal probe (page 12). It may also be measured incorrectly in the lab (page 15). - Ambient Fluoride analysis is not undertaken correctly (page 13). - Ambient Fluoride sampling is not undertaken correctly due to methodology and equipment limitations in measuring flow, leaks and temperature (page 14). - During the audit the samples became mixed up and analysis had to be rerun (page 15). <p>The consent holder should ensure that all processes are brought up to the required standard prior to the 2020 audit of Ravensdown monitoring.</p>
44.	All analyses in accordance with conditions on the consent shall be carried out by an independently accredited laboratory to ISO/IEC Guide 25, or to the satisfaction of the Council.	Low Risk Non-Compliance	<p>Most analyses associated with the consent are undertaken by independent and ISO accredited contractors. All other analyses undertaken by the consent holder are subject to external review by an ISO accredited auditor. In May 2019,</p>

			K2 Environmental undertook an audit of these processes which identified several areas for improvement. The audit report and the plan to address the shortcomings was provided to Council and the consent holder has completed the major improvements needed. The low-risk non-compliance remains for the initial areas of concern identified.
45.	The consent holder shall continuously (i.e. at intervals not exceeding 1 minute) measure the rate of SO ₂ discharge in the emissions from the acid plant stack. The method of measurement shall be in accordance with ISO7935:1992 (E) (Stationary source emissions – Determination of the mass concentration of sulphur dioxide – performance characteristics of automated measuring methods) or an alternative method, approved in writing by the Council. Testing results shall be reported as a mass emission rate in units of kg/hr as both 1-minute and 1-hour averages.	Full Compliance	Continuous measurement of SO ₂ in the acid plant stack is undertaken in accordance with ISO10396:2007 as approved by Council. Watercare Services Ltd are responsible for the monitoring and analysis. Testing results are provided in the required mass emission rates in the monthly data submission.
46.	All options for a continuous in-stack SO ₃ /H ₂ SO ₄ monitoring system shall be reviewed and analysed every 18 months by a suitably qualified independent person. The independent reviewer shall prepare a written report detailing the viability and estimated cost of all monitoring options internationally available. This information shall be provided to the Council no later than one month after the time of review. a. From 1st November 2012 continuous opacity measurements shall be undertaken in the acid plant stack at all times to provide an indication of acid mist emissions for operational purposes. Records of these measurements shall be kept and made available to Council on request.	Full Compliance	The required report was completed by WSP Opus in September 2018. The review found that the only suitable commercially available SO ₃ monitoring system was the pentol, as in the previous review it was deemed not suitable as the lower limit of detection was higher than the Ravensdown emissions for the majority of the time. The report was provided within the required timeframe. Continuous opacity measurements are recorded and reported in the monthly data submissions.
47.	The consent holder shall measure the rate of discharge of the SO ₂ , SO ₃ and H ₂ SO ₄ in the emissions from the acid plant stack, at least twice per week. This monitoring shall be undertaken in accordance with USEPA Method 8 ("Determination of sulphuric acid mist and sulphur dioxide emissions from stationary sources") or an alternative method that is approved, in writing, by the Council.	Full Compliance	During the compliance period the consent holder undertook twice weekly emissions testing of the acid plant stack. The monitoring was undertaken by an independent contractor in accordance with the USEPA Method 8 ("Determination of sulphuric acid mist and sulphur dioxide emissions from stationary sources").
48.	The discharge rate of the total sulphur compounds obtained in accordance with Condition 47 shall be used in conjunction with the continuous record of sulphur dioxide obtained in accordance with Condition 45 to determine a continuous record of the rate of sulphur compounds discharged, expressed as SO ₂ .	Full Compliance	The total discharge rate of sulphur compounds is continuously measured in accordance with condition 47 and condition 45. The rate of emissions for total sulphur compounds is recorded continuously and reported in the monthly data submissions expressed as SO ₂ .
49.	The consent holder shall measure the discharge rate of fluoride in the emissions from each of the den stacks and the hygiene stack, at least twice per week using wet chemistry methods. The measurement is to be carried out during superphosphate manufacture and no test may commence within one hour of starting acidulation. The method of measurements shall be in accordance with USEPA Method 13B ("Total fluoride specific ion electrode") or an alternative method approved, in writing, by the Council.	Low Risk Non-Compliance	Twice weekly fluoride measurements are taken from the den and hygiene stacks during superphosphate production. The procedure was included as part of the audit completed by K2 Environmental in May 2019 which identified that only soluble fluoride was being measured. Total and soluble fluoride is required to be measured twice a week. Please ensure that total

			fluoride is measured and reported in accordance with this condition.
50.	Concentrations of hydrogen sulphide in ambient air shall be monitored in accordance with the method of measurement (AS 3580.8.1 1990). The methods for sampling and analysis shall be automatic intermittent sampling - gas chromatographic method, or an alternate method approved in writing by the Council. The monitoring shall be carried out for a period of at least seven complete days at least twice per year. The location of the monitoring shall be agreed upon with the Council at the time of installation of the monitoring equipment. Results shall be reported as 1-hour averages.	Full Compliance	<p>Concentrations of H₂S is measured by Watercare Services Ltd using appropriate methods on behalf of the consent holder. Testing was undertaken continuously during April and May 2019 for the current period but will be in March and September for future periods. Additional H₂S monitoring was undertaken during the plant shutdown to better understand background levels from other sources.</p> <p>The location of the H₂S monitoring stations was agreed with Council prior to monitoring commencing.</p> <p>H₂S monitoring previously undertaken by Council was not completed during the 2018/2019 period. The consent holder is responsible for undertaking the required monitoring as per this consent.</p>
51.	The rate of particulate matter discharged from each mill shall be measured at least once every 3 months. The method of sampling and analysis shall comply with USEPA Method 5 or Method 17, ISO 9096:2003 or ASTM D3685-98, or a similar iso-kinetic method to the satisfaction of the Council. The testing time for each sample shall be 2-hours continuous, and at least three samples shall be collected. Results shall be adjusted to 0 C, 101.3 kilopascals, on a dry gas basis, and as a mass emission from each stack expressed as kg/hr.	Full Compliance	Rate of particulate emissions from the mill are measured quarterly when the plant is operating. The testing is undertaken using appropriate methods and the adjusted results are reported to council in the monthly data submission.
52.	Pressure and particulate in the baghouses serving the Bradley mills shall be continuously monitored and recorded to detect broken bags in the Bradley mills. A central alarm system shall be operated to warn the plant operator of a bag breakage or any change in pressure that may indicate a broken filter bag. The bag filters serving the Bradley mills shall also be manually inspected on a regular basis and shall be replaced where the inspection reveals excessive wear. Records shall be kept of bag filter pressure, Bradley mill shutdowns, manual inspections and filter bag replacements. These records shall be provided to the Council on request.	Full Compliance	A continuous pressure monitoring system for the baghouses is installed as required. Pressure drops trigger alarms and system shutdowns to reduce emissions of particulate matter from the site.
53.	The pH of the condensate from the den scrubbers and the hygiene scrubber stacks shall be measured at least twice each week. The method by which the condensate is to be measured shall be approved in writing by the Council.	Full Compliance	The pH from the den and hygiene scrubber stacks are measured twice per week using appropriate methods.
54.	<p>The consent holder shall continuously measure ambient fluoride, in accordance with the monitoring plan required by Condition 68 and based on 7-day filter exposures and results reported as average concentration (µg/m³) over that 7-day sample period. Measurements shall be taken at no less than five sites, within 4 kilometres (km) of the plant, including those listed in Table 1 below</p> <p>Table 1: Ambient fluoride monitoring sample sites – see table in consent document</p> <p>The location of the sites may be modified with the written approval of the Council.</p> <p>[Note: Approval from property owners/occupiers for the placement and operation of monitors is required.]</p>	Full Compliance	Ambient fluoride has been measured at the five offsite locations during the compliance period.

55.	Ambient fluoride measurement undertaken in accordance with Condition 54 shall occur at a height of 2.4 metres above ground level with no obstruction above 2 metres high in the direction of the RFC plant for 50 metres, unless otherwise approved in writing by the Council.	Full Compliance	Ambient fluoride has been measured in accordance with this condition. The inlet height for the monitoring station has been confirmed at 3.0 m. No obstructions were observed at the time of the site visit.
56.	The consent holder shall ensure ambient fluoride measurement is undertaken in accordance with AS3580.13.2 – 1991 (“Method 13.2: Determination of fluorides – Gaseous and acid soluble particulate fluorides – Manual, double filter paper sampling”) or an alternative method approved, in writing, by the Council.	Full Compliance	It has been confirmed that ambient fluoride, measurements are undertaken in accordance with AS3580.13.2 - 1991. Issues identified with the methodology for ambient fluoride monitoring in the 2019 audit have been addressed by the consent holder as per the submitted action plan.
57.	Concentrations of SO ₂ in ambient air shall be monitored continuously according to the method of measurement AS3580.4.1 – 1990 (“Method 4.1: Determination of sulphur dioxide – direct reading instrumental method”), or an alternative method agreed to in writing by the Council. The monitoring shall begin within 3 months of commencement of this consent. The monitoring site shall be located at or about the southern boundary of the “Winstones” site, to the southeast of the den stacks, and in an area agreed to in writing by the Council prior to establishment. Results shall be provided as 1-hour and 24-hour averages. Any exceedance of the Resource Management (National Environmental Standards for Air Quality) Regulations 2004 (NES) for SO ₂ shall be reported as soon as it is known.	Not Assessed	Ambient concentrations of SO ₂ are monitored continuously at the 'Winstones' site using an appropriate methodology. Data is provided in the required format and submitted monthly to Council. There have not been any exceedances of the NES SO ₂ limit during the compliance period. Could you please confirm by the 30th May 2020 where the other site of continuous monitoring of ambient SO ₂ is undertaken. This condition will be reassessed following receipt of this information.
58.	Concentrations of PM ₁₀ in ambient air shall be monitored continuously according to a method of measurement that complies with the monitoring requirements in the NES, or an alternative method agreed to in writing by the Council. The monitoring shall begin within 3 months of commencement of this consent. The monitoring site shall be located at or about the southern boundary of the “Winstones” site, to the southeast of the den stacks, and shall be agreed in writing by the Council prior to establishment. Results shall be provided as a 24-hour average. Any exceedance of the NES for PM ₁₀ shall be reported as soon as it is known.	Low Risk Non-Compliance	Continuous monitoring of PM ₁₀ in ambient air occurs at the 'Winstones' site using appropriate methodology. PM ₁₀ monitoring results are provided to Council monthly as 24 hour averages with any exceedances highlighted. PM ₁₀ exceedances should be reported to Council as soon as they are known and any potential causes for the exceedances identified. If the cause is from the consent holders operations then remedial action should be undertaken in order to mitigate and prevent future occurrences.
59.	Continuous monitoring of total suspended particulate matter shall be undertaken at two locations at all times that bulk material is stored outside. The monitoring sites shall be at the eastern boundary at a location most affected by bulk material dust discharges and at a reference location at the northern end of the site. The monitoring shall have an averaging period of 24-hours or less and the method of monitoring shall be approved in writing by the Council. Monitoring results shall be provided to the Council within two months of the cessation of bulk material storage and otherwise at least annually.	Not Applicable	During the compliance period there has been no outside storage of bulk material. The consent holder is aware of the requirements of this condition.
60.	Every 24 months, from the commencement of this consent, the consent holder shall review the available methodology for measuring acid deposition at no less than two sites in horticultural areas within 4 km of the plant and this information shall be provided to the Council. Any new methodologies will be reviewed against the current vegetation monitoring programme, as per Condition 66. The deposition monitoring protocol shall be determined in conjunction with and agreed to in writing by the Council prior to the commencement of monitoring.	Not Applicable	This is not required during the compliance period. The next review is due by May 2020.

61.	The consent holder shall undertake a survey every two years of the effects of fluoride etching on all properties (where the owner accepts the offer of a survey) within 1 km of the site using the methodology outlined in the BRANZ report DCZ059 (25 June 2004). Any windows found to be affected to 'pen test level 3' or where Light Gloss Units (LGU) are equal or less than 115 as described in BRANZ report DCZ059, shall be replaced by the consent holder if the property owner wishes the glass to be replaced.	Not Applicable	This was last completed during the 2017/2018 period and is not required to be undertaken until the 2019/2020 period.
62.	The consent holder shall advise the Council at least 24 hours in advance of a planned warm or cold start up of the acid plant. The Council shall be advised of the time when sulphur will be ignited and the person in charge of the procedure.	Full Compliance	Start up notification was received by Council In August 2018 as required by this condition. Notification was provided well in advance of the required 24 hours.
63.	At monthly intervals the consent holder shall provide the Council with copies of all information (including test results, reports and records) required to be collected in accordance with the conditions of this consent during the previous month, unless the condition specifically allows the information to be provided at a different interval. This information shall be provided in a report format, and shall comment on site performance and compliance with consent conditions.	Full Compliance	The consent holder provides a monthly data submission to Council in a report with associated raw data. Comments on compliance with consent conditions is included where appropriate.
64.	<p>The consent holder shall produce a report every year (the 'annual report') that presents and summarises all information on the monitoring required by this consent. The report shall include, but not necessarily be limited to:</p> <ul style="list-style-type: none"> a. quantification of and assessment of the impact of discharges of dust, PM10, SO2, fluoride and acidic compounds and b. the fluoride and foliar monitoring report and c. the impact of odour and H2S discharges from the site and d. a description of any potential and actual effects that have been identified and e. identification of trends of monitoring information and f. a summary of system modifications and g. recommendations for system improvements and h. the monthly fluoride content of phosphate rock blends. <p>The annual report shall be prepared for the period beginning July and ending June of the following year and provided to the Council before 31 October each year.</p>	Full Compliance	<p>The annual report was submitted to Council on the 31/10/2019. The annual report covers the period 1/7/18 to 30/6/19 for both the discharge to air and discharge to water consents.</p> <p>The annual report includes all sections as required by this condition. A summary is provided below, please refer to the annual report for full details and figures</p> <p>a-e) A summary and assessment of the annual monitoring data is provided and discussed for each major discharge contaminant.</p> <p>- PM10 There were 39 exceedances of the PM10 levels during the period however this is strongly influenced by other industries and sea spray. The Council air quality monitoring site had two exceedances on the 3/12/18 and 11/2/19 which Ravensdown also reported. The BAM tapes were analysed and showed high levels of calcium sulphate (3/12/18) and phosphate (11/2/19). Weather on both these days was consistent with emissions from Ravensdown facility. The consent holder is recommended to increase discipline around dust and particulate matter during transport and production to minimise these exceedances. Exceedances occurring in the absence of exceptional weather/sea conditions will be investigated further to ensure compliance with NES air quality regulation.</p> <p>- SO2, There were no exceedances of the 1-hour 350ug/m3 or 570ug/m3 limits during the period. There were two</p>

		<p>exceedances of the consented 10 minute average (350ug/m3) on the 24/08/18 and 27/11/18 both caused by sulphur fires at the melter. The Council has adopted the strategic goal of consistently meeting the WHO air health guidelines by 2025 which have a maximum 24-hour average of 20ug/m3 (currently set at 120ug/m3). Historical data from the site demonstrates that this is exceeded roughly 4 months of the year. It is likely that this will be addressed as part of the consent renewal process.</p> <p>- Ambient Fluoride, Monitoring has not highlighted any issues with ambient fluoride this period.</p> <p>- Acid plant, Monitoring has not highlighted any issues with SO2 and SO3 discrete or continuous data this period.</p> <p>- Manufacture, Monitoring has detected exceedances of the minimum pH limit of 2.7 on 3 occasions during the period for September, October and November 2018. Following these exceedances, the consent holder has made alterations to the caustic dosing system and no further exceedances have been noted.</p> <p>- Fluoride Leaf Monitoring during the period has shown no visible fluoride toxicity symptoms at samples sites. Long term trend indicates decreasing fluoride levels since 2010.</p> <p>- Odour, there have been no complaints regarding odour from this site during the period. Council recognises that the Awatoto airshed has noticeable odour issues associated with some of the industry in the area. We encourage all consent holders to undertake improvement works to operations to minimise contributions to the airsheds odour issues.</p> <p>- H2S, monitoring was undertaken during April and May 2019 to comply with the consent. It will be undertaken by Ravensdown during March and September for future periods. The H2S monitoring identified 110 exceedances of the 7ug/m3 limit during the two monitoring events undertaken at the Archimedes site. The exceedances occurred with wind directions ranging from N, E, S and W with the highest exceedances occurring during the N/NE winds. Additional monitoring was also undertaken during the shut down which showed dominant sources from the SE/S/SW of the monitoring site.</p> <p>f) A summary of system modifications for the period has been provided</p>
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65.	<p>The consent holder shall maintain a log of all complaints received directly from the public. The log shall include</p> <p>a. the date, time, and nature of the complaint and</p> <p>b. the telephone number, and address of the complainant (as provided) and</p> <p>c. weather information (including an estimate of wind speed and direction) and</p> <p>d. details of key operating parameters at the time of the complaint and</p> <p>e. the remedial action taken, as appropriate, to prevent further incidents.</p>	Full Compliance	<p>The consent holder maintains a complaints log for all complaints that are directly reported to them or via Council where they are notified. The complaint log contains all of the required information. This was viewed during the compliance visit and no complaints have been received by the consent holder during this period.</p>

	Complaints shall be reported to the Council within 12 hours of receipt and the log of complaints shall be made available to the Council on request.		
66.	<p>The consent holder shall undertake a vegetation monitoring programme that has been approved by the Council in accordance with Condition 68 of this consent. The programme shall provide for the following matters:</p> <p>a. A visual assessment of vegetation and</p> <p>b. A determination of foliar fluoride concentrations and</p> <p>c. The timing of the vegetation monitoring programme (which shall occur during the months of September to May inclusive for the duration of the consent, unless otherwise agreed in writing by the Council) and</p> <p>d. The monitoring methodology which shall be agreed in writing by the Council and</p> <p>e. The location of any monitoring, including but not limited to the following sites (Table 2):</p> <p>Table 2: Fluoride monitoring sample sites – see table in consent document.</p> <p>Provided that the location of the monitoring sites may be modified as appropriate with the written agreement of the Council.</p> <p>f. The requirement for the initial crop assessment to be completed within 12 months of the commencement of this consent and</p> <p>g. The requirement for the consent holder to provide a report to the Council upon the completion of the first two years of vegetation monitoring, to determine whether the monitoring programme may be amended or modified as necessary</p> <p>Provided that any amendments to the monitoring programme shall only occur with the written agreement of the Council.</p>	Full Compliance	<p>A vegetation monitoring program was received for the 2018/2019 period. This was conducted and reported in June 2019 by Plant and Food Research and was received within an appropriate time frame.</p> <p>The report addresses all of the requirements of this condition, please refer to the 18/19 leaf monitoring report for further details.</p>
67.	<p>The consent holder shall prepare and submit to the Council for approval within two months of the date of commencement of this consent, a Management Plan that details how all discharges to air from the site and their effects shall be measured, assessed and managed. The Management Plan shall be complied with at all times during the exercise of this consent, and shall include but not be limited to the management of the following matters:</p> <p>a. Dust including particulate and</p> <p>b. Outside phosphate rock storage and</p> <p>c. Sulphur dioxide and</p> <p>d. Acidic discharges and</p> <p>e. Fluoride and</p> <p>f. Odour.</p> <p>The Management Plan shall specify all actions necessary to ensure ongoing compliance with all conditions of this consent. The consent holder shall update the Management Plan at least once every two years, and otherwise where necessary, with the written agreement of the Council.</p>	Full Compliance	<p>A management plan has been submitted reviewed and accepted by Council during the 2018/2019 period. The next review is due at the latest in the 2021/2022 period or following any significant changes.</p>

<p>68.</p>	<p>The consent holder shall prepare and submit to the Council for approval within two months of the date of commencement of this consent, a Monitoring Plan that monitors the impact of discharges to air from the site. The Monitoring Plan must be complied with at all times during the exercise of this permit, and shall include but not be limited to the following monitoring matters:</p> <ul style="list-style-type: none"> a. Manufacturing stack monitoring requirements and b. Acid plan stack monitoring requirements and c. Dust monitoring requirements and d. Ambient SO₂, particulate matter and H₂S monitoring and e. Off site ambient fluoride monitoring requirements and f. Off site crop fluoride monitoring requirements and g. Sampling methods and h. Analytical methods and i. Reporting requirements and j. Sampling locations and k. Sampling frequencies and l. Auditing and peer review. <p>The consent holder shall update the Monitoring Plan at least once every two years, and otherwise where necessary, with the written agreement of the Council.</p>	<p>Full Compliance</p>	<p>A Monitoring Plan was received in March 2019 in accordance with this condition. The plan was review and accepted by Council. The next review is due at the latest in the 2021/2022 period or following any significant changes.</p>
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To assist you with the interpretation of the report, the compliance grades are:

FULL COMPLIANCE
Your operation is fully compliant with all relevant consent conditions, plan rules, regulations, and national environmental standards.

LOW RISK NON-COMPLIANCE
Your operation is complaint with most of the relevant consent conditions, plan rules, regulations, and national environmental standards. Non-compliance carries a low risk of adverse environmental effects or is technical in nature [e.g. failure to submit a monitoring report].

MODERATE NON-COMPLIANCE
Your operation is non-complaint with some of the relevant consent conditions, plan rules, regulations, and national environmental standards where there are some environmental consequences and/or there is a moderate risk of adverse environmental effects.

SIGNIFICANT NON-COMPLIANCE
Your operation has non-compliance with many of the relevant consent conditions, plan rules, regulations, and national environmental standards where there significant environmental consequences and/or there is a high risk of adverse environmental effects.