

Additional information and further explanation of the application and assessment of effects on the environment (AEE).

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Clarification, additional information and alterations to documentation	Addition to AEE
<p>Deposition of metals</p> <p>In order to provide additional information regarding cumulative effects from the deposition of metals, a supplementary Trace Metal Deposition Effects Analysis has been undertaken. The analysis is comprehensive and concludes that the assessments undertaken indicate there will be a negligible increase in trace metal loadings as a result of the cement manufacturing plant. Overall the effects of any emissions from the cement manufacturing process on surrounding soil and water quality are likely to be negligible. Deposition monitoring has been considered, however on the basis of the deposition modelling this will be impractical because the background concentrations will be orders of magnitude greater than any emissions from the stack.</p> <p>This supplementary information forms an addition to the Air Report contained in Appendix 14, Volume 4 of the AEE.</p>	<p>Trace Metal Deposition Effects Analysis included within Appendix 14, Volume 4</p>
<p>Plant site – bore water supply</p> <p>Relevant grid referencing and clarification of required production bores has been added to the description and assessment of water management contained within the AEE.</p> <p>This supplementary information forms an addition to the Water Report contained in Appendix 15, Volume 4 of the AEE.</p>	<p>Relevant grid referencing and clarification of required production bores included within Appendix 15, Volume 4</p>
<p>Plant site – construction dewatering</p> <p>Further explanation and clarification of the possibility of groundwater interception during the construction of plant foundations has been added to the description and assessment of water management contained within the AEE.</p> <p>This supplementary information forms an addition to the Water Report contained in Appendix 15, Volume 4 of the AEE.</p>	<p>Further explanation and clarification of the possibility of groundwater interception included within Appendix 15, Volume 4</p>

<p>Transmissivity and storativity – bore test analysis</p> <p>Further explanation and clarification of the determination of transmissivity and storativity and related values associated with bore testing at the plant site has been added to the description and assessment of water management contained within the AEE.</p> <p>This supplementary information forms an addition to the Water Report contained in Appendix 15, Volume 4 of the AEE.</p>	<p>Further explanation and clarification of the determination of transmissivity and storativity and related values included within Appendix 15, Volume 4</p>
<p>Tuff pit – abstraction of groundwater</p> <p>Further explanation and clarification of the extent of groundwater abstraction at the tuff pit, and associated effects on other groundwater users (including the proposed plant) has been added to the description and assessment of water management contained within the AEE.</p> <p>This supplementary information forms an addition to the Water Report contained in Appendix 15, Volume 4 of the AEE.</p>	<p>Further explanation and clarification of the extent of groundwater abstraction and associated effects included within Appendix 15, Volume 4</p>
<p>Conveyors</p> <p>To clarify the situation with respect to which of the conveyors are proposed to be covered or uncovered, the only uncovered belt conveyors are the conveyor to the gypsum and corrective limestone stockpiles and the associated stacker (note that the main raw material stockpiles are in enclosed buildings). This conveyor would run alongside the corrective limestone and gypsum stockpiles. Because the stacker would straddle and travel along the length on the conveyor, it is not practical to cover the conveyor. Moreover, the gypsum and corrective limestone are not dusty materials.</p> <p>All other belt conveyors are to be either enclosed or inside buildings. The pan conveyor from clinker cooler to clinker silo is to be fully enclosed and the airslide conveyors for cement would all be fully enclosed.</p>	
<p>SO₂ emissions</p> <p>To clarify, the assessment of the effect of an SO₂ stack emission of 400mg/Nm³ has assumed a worse case basis. That is, it was assessed on the basis the plant is operating in direct mode (i.e. the assessment assumed direct mode for 100% of the time). Direct mode however is expected to occur for a maximum of 10% of the time.</p> <p>Holcim's expectation is that the average SO₂ stack emission would be less than 230mg/Nm³.</p>	

<p>SO₂ reduction technology</p> <p>Based on the estimated SO₂ emissions, Holcim does not expect that additional abatement measures would be required in order to meet the daily average emission target of 400 mg/Nm³. If a sulphur absorbent addition system was retrofitted, the system would have only a small and periodic impact on overall average SO₂ emissions, as it would only be used as required in direct mode to ensure compliance with the prevailing target maximum SO₂ stack concentration. Therefore no change to the emission concentration is anticipated.</p>	
<p>Air quality monitoring data</p> <p>A summary of air quality monitoring data on the plant site has now been updated for the most recent data collected. This supplementary information forms an addition to the Air Report contained in Appendix 14, Volume 4 of the AEE.</p>	<p>Air Quality Monitoring Data included within Appendix 14, Volume 4</p>
<p>Meteorological data</p> <p>A windrose developed from data gathered at the meteorological station located at the top of the escarpment is now available. It is noted that there was a fault with the data logger on this site and the additional information is based on contiguous data from May to November 2006, and February to March 2007.</p> <p>Updated windroses have also been included for the Ngapara and main site weather stations.</p> <p>This supplementary information forms an addition to the Air Report contained in Appendix 14, Volume 4 of the AEE.</p>	<p>Windrose for the meteorological station located on top of the escarpment and also updated windroses for the plant site and Ngapara included within Appendix 14, Volume 4</p>
<p>Selective Non-catalytic Reduction technology</p> <p>To clarify, it is intended that SNCR be used to achieve and guarantee compliance with the proposed emission standard of 500 mg/Nm³. Given that there is no significant impact on ambient air quality based on this level of stack emissions, it is not anticipated that SNCR would be configured to achieve a lower target.</p>	
<p>Water vapour</p> <p>To clarify, in considering alternative methods to discharge, water extraction from the exhaust gases was considered during the preparation of the proposal. Technologies that could be used to recover the water from the stack involve cooling the exhaust gases to condense the water. After cooling, reheat of the gases would be required to ensure good dispersion from the stack.</p> <p>Holcim is not aware of any large scale operating systems of this nature, and do not regard water extraction from the exhaust as available technology. Furthermore, Holcim certainly does not believe such an installation would be cost effective.</p>	

<p>Water supply calculation</p> <p>Further explanation and clarification of the calculation of water supply and efficiency of use has been added to the description and assessment of water management contained within the AEE.</p> <p>This supplementary information forms an addition to the Water Report contained in Appendix 15, Volume 4 of the AEE.</p>	<p>Further explanation and clarification of the calculation of water supply and use included within Appendix 15, Volume 4</p>
<p>Engineered landforms and other structures/works in relation to watercourses</p> <p>Further explanation and clarification of those engineered landforms to be constructed within the bed of running or ephemeral watercourses has been added to the description and assessment of water management contained within the AEE. Similarly, clarification has also been added of any other structures or works proposed to occur within the bed of running or ephemeral watercourses.</p> <p>This supplementary information forms an addition to the Water Report contained in Appendix 15, Volume 4 of the AEE.</p>	<p>Further explanation and clarification of works/structures in relation to watercourses included within Appendix 15, Volume 4</p>
<p>Stormwater and drainage water drains in relation to existing watercourses</p> <p>To clarify, all of the proposed works associated with cutting in of stormwater and drainage water drains into existing watercourses would comply with all the clauses within rule 13.5.1.1 of the Regional Plan: Water for Otago, except that some of the larger works would take a period greater than 10 hours in duration to complete. Where this occurred, it is Holcim's intention that this be covered by the application seeking resource consent to undertake works in the beds and margins of waterways for the purpose of water management (see application forms).</p> <p>Further explanation and clarification of the management of works to ensure that there are no adverse effects on the waterways has been added to the description and assessment of water management contained within the AEE.</p> <p>This supplementary information forms an addition to the Water Report contained in Appendix 15, Volume 4 of the AEE.</p>	<p>Further explanation and clarification of the management of works in relation to existing watercourses included within Appendix 15, Volume 4</p>

<p>Wastewater disposal at Weston quarry and Ngapara sites</p> <p>To clarify, the disposal of treated wastewater would be either via field drain or by subsurface drip line depending on site conditions, which will be further investigated during detail design.</p> <p>This clarification forms an addition to the Water Report contained in Appendix 15, Volume 4 of the AEE.</p>	<p>Clarification of the avoidance of subsurface or evapotranspiration wastewater disposal systems at Weston quarry and Ngapara included in Appendix 15, Volume 4 of the AEE.</p>
<p>Water Management</p> <p>Further explanation and clarification of the proposed water management conveyance systems (relative to a 10% AEP standard) and associated overflows has been added to the description and assessment of water management contained within the AEE.</p> <p>This supplementary information forms an addition to the Water Report contained in Appendix 15, Volume 4 of the AEE.</p>	<p>Further explanation and clarification of overflows from the water management conveyance systems included within Appendix 15, Volume 4</p>
<p>Zinc in stormwater</p> <p>References within the AEE to zinc are in relation to the range of potential stormwater contaminants that could occur. Notwithstanding that, elevated levels of zinc are not anticipated, and any contaminants in stormwater would be controlled through appropriate management.</p> <p>Holcim will not use roofing or cladding materials that leach significant amounts of zinc, i.e.</p> <ul style="list-style-type: none"> ▪ No galvanised steel. ▪ No zinc-alum steel unless coated and maintained with a permanent non-zinc-leaching sealer. ▪ No zinc-leaching paints. 	

<p>Sediment ponds</p> <p>To clarify, sediment pond A at the Weston quarries and the sediment pond at Ngapara would each have a catchment greater than 50ha as provided for in rule 12.3.2 (Regional Plan: Water for Otago). It is intended that this matter be covered by the application seeking resource consent to dam and divert stormwater (see application forms).</p> <p>Further explanation and clarification of the engineering of associated dam structures has been added to the description and assessment of water management contained within the AEE. Similarly, confirmation of pond catchment areas and sizes has also been added.</p> <p>This supplementary information forms an addition to the Water Report contained in Appendix 15, Volume 4 of the AEE.</p>	<p>Further explanation and clarification of engineering of sediment pond dam structures, and of associated catchment areas and sizes included within Appendix 15, Volume 4</p>
<p>CALPUFF</p> <p>A supplementary CALPUFF Version 6 Modelling Analysis has been prepared for inclusion with the Air Report (Appendix 14). The analysis concludes that the modelling presented in the AEE is representative.</p> <p>This supplementary information forms an addition to the Air Report contained in Appendix 14, Volume 4 of the AEE.</p>	<p>Supplementary CALPUFF Version 6 Modelling Analysis included within Appendix 14, Volume 4.</p>
<p>Main kiln stack height</p> <p>In order to explain the selection of a 104 metre height for the main kiln stack, a supplementary report has been provided by URS for inclusion in the AEE as an Appendix to the Air Report (Appendix 14).</p> <p>This supplementary information forms an addition to the Air Report contained in Appendix 14, Volume 4 of the AEE.</p>	<p>Supplementary Main Kiln Stack Height Analysis included within Appendix 14, Volume 4.</p>