
Appendix C

Updated mitigation measures

A revised summary of the proposed mitigation, management and monitoring commitments for the Project is presented in Table C.1. New mitigation measures or mitigation measures that have changed substantially since the submission of the Amendment Report (EMM 2023b) are shown as bold text.

Table C.1 Summary of commitments

ID	Mitigation, management and monitoring commitments
Greenhouse gas	
GHG1	HVO will conduct a trial of gas pre-drainage in areas identified with higher potential, to investigate the feasibility and effectiveness of gas pre-drainage. The design of the trial will be developed in consultation with relevant stakeholders to the satisfaction of the Planning Secretary and be provided within two years of commencement of the Project.
GHG2	HVO will continue to undertake regular reviews of technologies and abatement measures to reduce GHG emissions from the Project, including whether these measures are reasonable and feasible to implement at HVO. These reviews will be undertaken every three years and will include consideration of the use of alternate fuels including biofuels and hydrogen, and the transition to an electric powered fleet, as these technologies advance and more information becomes available.
GHG3	A greenhouse gas management plan will be developed to reflect the amended Project and will include an action plan (updated every 3 years) for investigating and implementing all reasonable and feasible abatement measures to minimise GHG emissions.
GHG4	To meet the requirements of the Safeguard Mechanism, HVO will implement abatement activities identified by mitigation measure, or purchase carbon offsets such as Australian carbon credit units (ACCUs) or Safeguard Mechanism credit units (SMCs), whichever is cost effective and practical at the time.
GHG5	HVO will make additional voluntary contribution towards the NSW emission-reduction targets to reflect consideration of the NZF Act. With this in mind, HVO proposes that the emissions of the Project are aligned, so far as practicable, with the NZF Act emission-reduction targets, including by using offsets to reduce the Amended Project's net GHG emissions where it is not feasible to avoid, reduce or substitute emissions.
Air quality	
AQ1	Air quality will continue to be managed and monitored as per the HVO AQMP, which will be updated to reflect the Project. The AQMP will detail the monitoring and management controls to be implemented to manage air quality impacts associated with the Project including ongoing implementation of the proactive and reactive management protocols and include control measures for managing other air quality aspects such as blast fume and spontaneous combustion.
AQ2	Reactive air quality management will continue to assess the need to modify the activities in response to the following triggers: <ul style="list-style-type: none"> • visual conditions, such as excessive visible dust, identified through the use of cameras as well as visual observations • meteorological conditions, such as dry, strong wind conditions • ambient air quality conditions (that is, elevated short-term PM₁₀ concentrations, observed through air quality monitoring results) • a Trigger Action Response Plan (TARP) process will be implemented, and dust levels investigated when the TARP process is enacted to identify likely sources of dust.
AQ3	Proactive air quality management measures will include daily forecasts, alerting operations of the potential requirement to modify mining activities, as appropriate, to minimise or avoid the potential dust impacts.
AQ4	It is anticipated that receptor 121 will be afforded voluntary air quality acquisition rights as a result of the Project in accordance with the VLAMP.
AQ5	A review of the existing air quality monitoring locations will be undertaken within 12 months of the commencement of the Project, so that the monitoring network provides adequate coverage of the Project area.
AQ6	The program for all private residences within 4 km of the proposed mining area whereby these residences will be eligible for tank inspections, and cleaning and installation of first flush filter systems for residential water tanks and domestic taps will continue to be implemented.

ID	Mitigation, management and monitoring commitments
AQ7	A site-specific blast management plan will be implemented during operations, including key fume management actions, such as defining the potential risk zone based upon weather patterns and obtaining permissions to fire based on an assessment of real-time weather conditions.
AQ8	Mitigation measures to manage diesel combustion emissions include: <ul style="list-style-type: none"> servicing all machinery in accordance with original equipment manufacturer recommendations for maintenance targeting the maintenance to ensure, as far as reasonably practical, equipment remains fit for purpose over its whole life cycle.
Noise	
NOS1	Noise will continue to be managed and monitored as per the HVO Noise Management Plan, which will be updated to reflect the Project. The management plan will describe aspects such as: <ul style="list-style-type: none"> Best practice noise management measures to be implemented across the site. Noise monitoring. Triggers for the modification of equipment operation during periods of elevated noise. A review of both real-time and attended compliance monitoring locations will be undertaken within 12 months of the commencement of the Project, to ensure the monitoring network provides adequate coverage of the Project area, and the existing Noise Management Plan will be updated accordingly.
NOS2	A review of both real-time and attended compliance monitoring locations will be undertaken within 12 months of the commencement of the Project, to ensure the monitoring network provides adequate coverage of the Project area, and the existing Noise Management Plan will be updated accordingly.
NOS3	HVO will develop and implement a Construction Environmental Management Plan (CEMP), or equivalent, which will be prepared prior to the commencement of any construction activities. The CEMP will include the identification of feasible and reasonable noise mitigation measures relevant to the construction aspects for implementation during construction activities.
NOS4	HVO should apply all feasible and reasonable work practices to meet the 'noise affected' level and should schedule construction works within standard construction hours where practical.
NOS5	Various levels (height options) will be provided for overburden emplacement to allow shielded emplacement to occur deeper in the mining area during adverse meteorological conditions.
NOS6	Haul route alignments within the mining area will maximise the available topographical shielding provided by the mine design, where practical.
NOS7	The remaining fleet of large mining equipment will be progressively attenuated and BATEA sound power levels will be implemented, where reasonable and feasible, for significant noise generating mobile equipment.
NOS8	Dozers will be restricted if deemed to be a primary source of noise during periods of meteorological enhancement.
NOS9	Restricting operation of exposed drills during periods of meteorological enhancement, if required.
NOS10	An 8 m high roadside bund will be constructed on the exposed side of the haul road from the HVO Mitchell Pit towards the Howick CPP for approximately 900 m.
NOS11	The following receptors are anticipated to be afforded voluntary noise mitigation rights in accordance with the VLAMP as a result of the amended Project: <ul style="list-style-type: none"> HVO North: 326, 328, 330, 437, 487 HVO South: 121, 160, 161, 162, 256, 258, 261, 497. The following 12 receptors hold existing noise mitigation rights under the current HVO South project approval, and will be offered to maintain their rights, despite not being required to by the Project: <ul style="list-style-type: none"> 120, 122, 123, 163, 244, 245, 246, 247, 260, 308, 311, 317.

ID	Mitigation, management and monitoring commitments
Blasting	
BLA1	<p>Blasting and vibration will continue to be managed and monitored as per the HVO Blasting Management Plan (BMP), which will be updated to reflect the Project. The BMP will describe aspects such as:</p> <ul style="list-style-type: none"> • blasting times and frequency • pre-blast assessment protocol • road closure protocols • notification protocols • blast model review and optimisation • blast and vibration monitoring.
BLA2	<p>Blasting will be undertaken:</p> <ul style="list-style-type: none"> • between the hours of 7am and 6pm, Monday to Saturday • no blasts on Sundays or public holidays • up to 3 blasts per day and 12 blasts per week at HVO North • up to 3 blasts per day and 15 blasts per week at HVO South.
BLA3	<p>When blasting within 1,500 m of the heritage sites the Great Lodge, Carrington Homestead and Wandewoi Homestead, blast design measures will be carried out to meet applicable ground vibration criteria.</p>
BLA4	<p>Increased blast control measures will be employed when blasting within the identified sections of HVO North and HVO South (shown in Figures 11.3, 11.4 and 11.5 of the EIS (EMM 2022a)) to manage relevant overpressure and vibration levels below applicable limits for public infrastructure, private residences and heritage items.</p>
BLA5	<p>The existing blast monitoring system will continue to be utilised for the Project. An additional three monitoring units will be installed at different stages of the amended Project and one portable monitor will be used as follows:</p> <ul style="list-style-type: none"> • one monitor at a location representative of identified private residences in Jerrys Plains • one monitor at a location representative of the Great Lodge (heritage site) • one monitor at a location representative of the Oaklands Homestead and associated structures • one portable monitor positioned at a location representative of the closest heritage site (Carrington or Wandewoi Homestead) to the active blasting area <p>Timing for the commencement of additional blast monitoring will be detailed in the BMP.</p>
Water resources	
WAT1	<p>The HVO Water Management Plan will be updated to include the Project, and will describe aspects such as:</p> <ul style="list-style-type: none"> • erosion and sediment control measures • water sharing arrangements with neighbouring mines • methods for measuring and estimating water take (where practical), which will be reviewed for compliance with the <i>NSW Non-Urban Water Metering Policy</i> • tailings management • groundwater model review and validation • groundwater and surface water monitoring, including review and adaptive management procedures • trigger action response plans, including trigger action response plans for unexpected changes in surface and groundwater results.
WAT2	<p>The Carrington West Wing Levee will be monitored during operational life of the Project, particularly following large flood events (5% AEP or larger) to identify signs of instability and potential corrective action.</p>
WAT3	<p>The frequency of comprehensive surface water quality analysis will be increased from an annual basis to six monthly.</p>

ID	Mitigation, management and monitoring commitments
WAT4	<p>Improved flood protection levees will be implemented as follows:</p> <p>HVO North:</p> <ul style="list-style-type: none"> • North Pit levee - up to 0.1% AEP • Carrington West Wing levee - up to 0.1% AEP. <p>HVO South:</p> <ul style="list-style-type: none"> • Cheshunt levee - up to 0.1% AEP • Riverview levee - up to the Extreme Flood Event (defined as four times the 1% AEP).
WAT5	<p>Consistent with the methodology used for the Carrington Pit LPBW, the Carrington West Wing LPBW will be constructed prior to mining within 100 m of the connected remnant western arm of the paleochannel. The Carrington West Wing LPBW will be designed to achieve a permeability of 1×10^{-8} m/s.</p>
WAT6	<p>Additional monitoring bores will be installed within the zone of predicted short-term incremental drawdown, approximately one year prior to mining recommencing in the remnant paleochannel. A network of eight nested monitoring bores are proposed and will be included in the updated water management plan.</p>
WAT7	<p>Piezometers will be installed within the Carrington West Wing LPBW, consistent with the approach used for the Carrington Pit LPBW. The purpose of the piezometers will be to monitor for changes in salinity and pressure.</p>
WAT8	<p>A LPBW monitoring and management plan will be prepared in consultation with DCCEE Water Group (which will include assigned trigger levels and a response plan for trigger level exceedance and deviations from predictions).</p>
WAT9	<p>The Carrington West Wing levee will be decommissioned at closure to reinstate floodplain storage in this area.</p>
WAT10	<p>HVO will secure additional water entitlement that may be needed during operations and during closure in accordance with the amended Project water licensing strategy.</p>
Biodiversity	
BIO1	<p>Biodiversity will continue to be managed as per the Biodiversity Management Plan, which will be updated to reflect the Project. The management plan will describe aspects such as:</p> <ul style="list-style-type: none"> • Pre-clearance and clearance protocols for vegetation and fauna. • Pest, weed and pathogen control measures. • Bushfire management actions. • Monitoring and adaptive management strategies.
BIO2	<p>Wildlife warning signs such as 'Injured Native Wildlife' signs will be installed in likely high impact locations along the realigned Lemington Road.</p>
BIO3	<p>Measures will be implemented to protect the river red gum populations located within the River Red Gum Additional Disturbance Area during construction of the realigned transmission lines in this area.</p>
BIO4	<p>River red gum health monitoring will continue, in accordance with the River Red Gum Rehabilitation and Restoration Strategy, which will be updated for the Project. This will include a change in classification for the River Red Gum Additional Disturbance Area from a 'low priority' to a 'priority site'.</p>
BIO5	<p>A biodiversity offset strategy will be developed for the Project based on the credits required to be retired to offset the impacts of the Project and the options available under the BC Act and BC Regulation including:</p> <ul style="list-style-type: none"> • Land based offsets (HVO will retire the required number and class of credits determined in accordance with the BDAR and the offset rules in the BC Regulation through the establishment of new stewardship sites (and the subsequent retirement of credits) or by retiring credits from existing stewardship sites). • Purchasing credits from the market. • Paying into the Biodiversity Conservation Fund.
BIO6	<p>An Ecological Restoration Plan (ERP) will be developed for the Hunter Floodplain Red Gum Woodland EEC. The plan will provide a framework for the management of the vegetation community during and post-development of the Project, within the Project disturbance area. The ERP will be developed prior to the disturbance of the noted EEC and be included within the existing Integrated Biodiversity Management Plan. The ERP will include management actions to inform specific weed control, re-establishment of vegetation, security/protection measures and a trigger response plan for the continued improvement of the EEC.</p>

ID Mitigation, management and monitoring commitments	
Aboriginal cultural heritage	
ACH1	Direct impacts to Aboriginal cultural heritage site CM-CD1 (AHIMS Site 37-2-1877) will continue to be avoided.
ACH2	Direct impacts will be avoided to two scarred trees of Aboriginal cultural heritage origin (AHIMS #37-3-1635 and AHIMS #37-3-1629), identified as being of high archaeological significance.
ACH3	A consolidated Aboriginal Cultural Heritage Management Plan (including HVO North and HVO South) will be developed for the Project in consultation with RAPs and Heritage NSW. This will include: <ul style="list-style-type: none"> mitigation and management measures for identified Aboriginal heritage sites unexpected finds protocols consultation.
ACH4	HVO will provide assistance to RAPs to connect with family and Country to facilitate the transfer of knowledge and culture to younger generations. The form of this assistance will be developed in consultation with these groups and documented with the revised Aboriginal Cultural Heritage Management Plan (ACHMP).
Historic heritage	
HH1	A Historic Heritage Management Plan (HHMP) will be prepared for the Project, which will include the historic heritage items identified in the historic heritage study area, and will include: <ul style="list-style-type: none"> a description of the condition and significance assessment of identified items management measures and guidelines for the protection and conservation of each item an unanticipated finds protocol.
HH2	Archival recording in the form of digital photography will be undertaken to capture the pre-development state prior to disturbance of the remnant stockyards and remnant foundations at HVO North.
HH3	Realigned transmission line structures will be sited so that no direct impacts occur to the remnant foundations identified at HVO North, as described in Appendix N.
HH4	An assessment of significance will be prepared for the Great Lodge at HVO South.
Traffic and transport	
TT1	A Traffic Management Plan will be developed for the Project and will include: <ul style="list-style-type: none"> measures to be implemented to minimise interruption to the local road network during construction activities, and ensure the safe ingress and egress of construction vehicles liaison with relevant road authorities and local school and bus providers.
TT2	To manage intersection performance affected by increased demand by construction traffic: <ul style="list-style-type: none"> Lemington Road/New England Highway – minimise outbound construction truck movements during the AM peak period (6.00 am–7.00 am) Old New England Highway/New England Highway – the primary access will be via the Liddell Station Road access, so that the Old New England Highway is used as a secondary access only.
TT3	The new portion of Lemington Road will be constructed and complete prior to the closure of the existing alignment. Other than managed traffic control during the tie-in work, the construction of the new alignment will not restrict access or use of the existing Lemington Road.
Visual amenity	
VA1	As part of detailed design, HVO will investigate the feasibility of planting vegetation adjacent to the realigned Lemington Road to provide an effective visual screen and reduce views of the road from residences and local roads.
Rehabilitation and closure	
RC1	The Rehabilitation Management Plan will be updated for the Project.
RC2	The final landform in areas disturbed by the Project will incorporate natural design elements generally in accordance with the conceptual design presented in this EIS.

Mitigation, management and monitoring commitments	
RC3	The final land use across rehabilitated areas of the site will include a combination of grazing and native woodland ecosystem land uses, or as determined as part of detailed closure planning processes.
RC4	A detailed closure plan will be developed within five years of cessation of mining.
RC5	Rehabilitation monitoring will be undertaken using analogue sites and landscape function analysis to assess rehabilitation progress and success, as detailed in the Rehabilitation Management Plan.
Social	
SOC1	A SIMP will be developed for the Project which will include a monitoring and management framework.
SOC2	HVO will continue to administer the community grants program which invests in programs, events and services that promote community cohesion, connectedness and support.
SOC3	As part of the development of the SIMP, HVO will develop a funding framework to enable funding of programs and projects that align with Closing the Gap initiatives, including job readiness programs, assistance relating to tendering for work at HVO by Aboriginal suppliers, and a commitment of \$1,000,000 over the first 10 years of the Project. These initiatives will be developed as part of the preparation of the SIMP, which will also outline the proposed implementation plan.
Hazards, public safety, and health	
HCH1	Implementation of the site hydrocarbon practices and PIRMP.