



Environment.

Our approach to environmental management focuses on avoiding environmental impacts where possible, mitigating unavoidable impacts, rehabilitating or restoring disturbed areas, and offsetting residual impacts that cannot be avoided, minimised or rehabilitated.

We undertake extensive assessments and management planning in relation to surface water, groundwater, flooding, flora and fauna, Aboriginal cultural heritage, historic heritage, air quality, noise, agriculture and geochemistry. We develop comprehensive environmental assessments for all our projects and prepare management plans for each stage of a project – from construction and operation, to rehabilitation and closure. We also consult extensively with relevant stakeholders throughout formal planning and approval processes.

In Australia, mining is a highly regulated industry subject to constant monitoring and compliance activity by relevant government authorities. We observe the strict requirements that apply to our operations, which, on any given day, means complying with thousands of environmental obligations across our sites. We believe in planning carefully, mining responsibly in line with our approval conditions, and rehabilitating land progressively.

Our comprehensive management of environmental impacts is complemented by ongoing formal and informal stakeholder engagement – including through Community Consultative Committees (CCCs) – and direct community feedback via our hotlines, open days and more. We work together with our local communities, including neighbouring landholders, and adjust our management approach based on this consultation.

In FY20, we created a new Health, Safety & Environment (HSE) function reporting directly to the Managing Director and CEO. This new executive-level role will provide dedicated leadership and ensure greater awareness and integration of environmental considerations across all limbs of the business. So we can continue build and maintain our social licence to operate, it is important that we carefully and responsibly manage our environmental risks, deliver planned improvement and compliance and look to more integrated and sustainable solutions to minimise our impacts.



“We all have a role to play in ensuring we meet our compliance obligations and minimise our impacts on the environment and community. By understanding our impacts and having the right controls in place, we can not only co-exist with our surrounding community but add to its prosperity and leave a legacy we can be proud of.”

Sarah Withell,
Executive General Manager -
Health, Safety & Environment

Water use

Water is essential for life and human economic and social development, and as it is also a precious resource, water can create complex interdependencies and relationships associated with access and usage. Water is fundamental to our business and to sustaining our mine operations and the livelihoods that depend on their economic output. At Whitehaven Coal the responsible management of water is a primary focus.

During FY20, our total operational water inputs from water allocation licenses was 3,359 megalitres (ML), around 32% of our total allocations from groundwater (bore water and 'passive take') and extractions from the Namoi River. This represents

a decrease in water take from our allocations in FY19, which was around 42%, due to a range of water saving measures implemented throughout the period.

We look to recycle water wherever we can, for example, by recirculating within our coal handling and processing plants. In FY20 38% of our water use was recycled water.

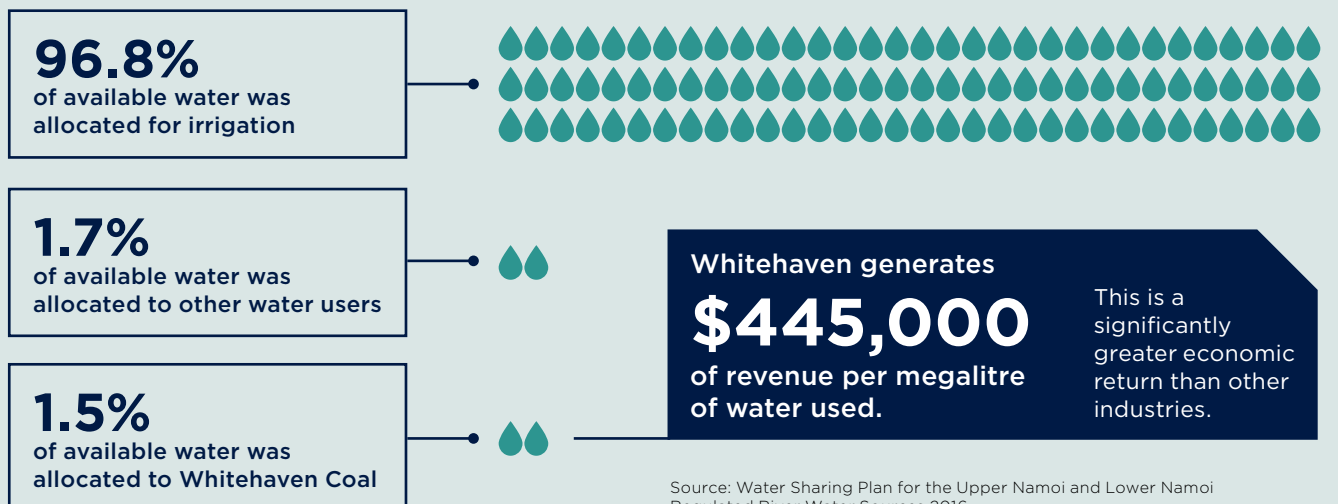
Working closely with relevant NSW water management and regulatory authorities, we monitor water quality and quantity, including water balances, to measure the volume and quality of water inflows, current storage on site, usage, losses, recycling, and any discharges. This information, plus predicted operational requirements and weather patterns, is used to

plan for future water use. Water meter readings are checked by WaterNSW to monitor compliance, and we regularly report our water management practices and outcomes through formal mechanisms including Annual Reviews for our operational sites.

Our Group Manager Water and Property is accountable for developing and implementing the Whitehaven water strategy for all operating sites and future developments. Essential to this role is effective engagement with key stakeholders including regulators, local landholders and industry specialists to further improve our sustainable management practices and drought resilience.

Water use in North West NSW

In FY20 253,247 megalitres of water from the Lower Namoi River was allocated, or made available to licensed water users in the region.



Maintaining operations throughout the drought

The current drought in NSW rivals the Federation Drought of the early 1900s in its intensity and duration and has required water users to focus on how water is accessed, used, shared and valued. As with all water users, managing our operational water needs during times of drought has posed challenges.

Throughout FY20, water saving initiatives were employed across our operations to reduce water consumption during this period, including the use of ‘dust binders’ for haul road dust suppression. We maintained operations during this time, reducing water consumption without creating additional air quality impacts. Our continued, uninterrupted operations made a material

contribution to economic stability in North West NSW and provided an avenue for those in other sectors, such as farmers, to generate additional, off-farm, income.

While meaningful rainfall was received in North West NSW in early 2020, and a return in the region to a more average rainfall pattern materialised, we have nonetheless made a significant effort to future-proof our operations, including by conducting further detailed modelling of future operational needs and incorporating additional water saving measures.

It is essential all affected stakeholders continue to work with governments and water regulators to address the challenges posed

by the drought. Statutory water management frameworks must safeguard water for future generations, but also support the efficient use of available resources and practical water governance measures. We continue to work with all stakeholders transparently and constructively on this critical issue and to:

- identify material water impacts, risks and opportunities
- improve our overall understanding of our water use at the regional and sub-regional level
- explore how we can improve our water management performance and contribute to individual water saving and water-sharing initiatives.

Water allocation and extraction

		FY20	FY19	FY18	FY17	FY16
Water licence allocation (ML)	Upper Namoi Alluvial	1,810	-	-	-	-
	Gunnedah Oxley Basin	4,428	-	-	-	-
	Great Artesian Basin - Southern Recharge	322	-	-	-	-
	River water	3,873	-	-	-	-
	Total	10,433	9,978	9,978	9,924	9,925
River/bore water extraction (ML)	Bore extraction	1,651	-	-	-	-
	River extraction	427	-	-	-	-
	Passive take (groundwater)	1,281	-	-	-	-
	Total	3,359	4,183	3,034	1,456	1,580
Water used (ML)	CHPP (gross)	3,428	-	-	-	-
	Dust suppression	2,370	-	-	-	-
	Other	467	-	-	-	-
	Total	6,265	6,826	5,316	3,649	3,964
Water withdrawal by source (ML)	Groundwater	2,932	-	-	-	-
	River water	427	-	-	-	-
	Surface water (mine water runoff)	1,255	-	-	-	-
	Total	4,072	-	-	-	-
Water exported for irrigation (ML)		80	102	42	-	-
Water recycled (ML)	CHPP recycled water	2,392	-	-	-	-
Water recycled (%)		38	23	22	18	19

The values presented in this table are a combination of metered, estimated and modelled data.

Emissions

As a producer of high-quality coal that helps our customer countries meet their greenhouse gas (GHG) emissions reduction targets, we are conscious of the intersection between greater efficiency, cost and emissions reductions. We are committed to ongoing efforts to reduce our operational emissions from energy use and haulage. At the same time, we believe GHG reduction efforts should not deprive people and communities of access to affordable and reliable energy.

Although GHG emissions have increased year on year due to our growing operational presence, we continue to look at ways we can better integrate productivity and operational efficiency measures to deliver improved emissions outcomes across our operational sites. This reflects our belief that we must do more than rely on the low-emission characteristics of our high-quality coal and reduce direct emissions from our own operations.

We continue to work with key partners to develop innovative ways to reduce our energy consumption. Working with Cummins and Hitachi, we have rolled out updated fuel calibrations on a fleet of 17 diesel-electric trucks at our Tarrawonga mine during FY20. Minor changes in engine/truck control software to improve fuel efficiency will enable us to reduce fuel consumption by 6.6%, which represents a saving of 10 litres of fuel per hour or approximately 600 kilolitres over the course of a year.

As outlined in the Sustainability & climate change section, we invest in the development of low-emissions technologies through Low Emission Technology Australia (formerly COAL21).

We acknowledge greenhouse gases are produced through the mining process and from the use of coal in power stations and blast furnaces. Below we set out our GHG emissions, as required under the *National Greenhouse and Energy Reporting Act 2007*.

Scope 3 emissions are not included in Australia's National Greenhouse and Energy Reporting scheme, as indirect emissions produced downstream are beyond the operational control of an Australian company or entity. Scope 3 emissions from the use of our coal are represented as Scope 1 emissions arising from the power generation and steel-making sectors in our customer countries. Scope 3 emissions are not counted in Australia's national emissions inventory, as this would constitute double counting contrary to the Paris Agreement's transparency framework.

Because our coal is some of the highest quality low-ash, low-sulphur, high-energy coal in the seaborne trade, it produces among the lowest emissions per tonne in the world. In this way, our product displaces lower-quality, higher-emissions coal such as that from Indonesia or China.

All of our customer countries are signatories to the Paris Agreement or have domestic policies that are consistent with the outcomes of the Paris Climate Conference (COP21). Our largest customer, Japan, has included high-quality coal as a key component of its COP21 nationally determined contribution.

	FY19 ²	FY18	FY17	FY16	FY15
Total energy use (terajoules) ¹	6,150	5,872	4,926	3,968	3,128
Intensity - total energy use (gigajoules per tonne of run-of-mine (ROM) coal) ⁴	0.265	0.256	0.215	0.193	0.198
Scope 1 and 2 greenhouse gas emissions (kilotonnes of CO ₂ -e)	1,613	1,440	1,350	1,162	762
Intensity - greenhouse gas emissions (tonnes of CO ₂ -e per tonne of ROM coal) ³	0.069	0.063	0.059	0.057	0.048

1 CO₂-e stands for 'carbon dioxide equivalent'

2 Most recent reportable period

3 The incremental increase in GHG emissions intensity is attributed to an increase in fugitive emissions related to increased ROM coal extraction

4 The incremental increase in overall energy intensity is also related to our growing scale, and includes increased requirements to move waste

Air quality

We employ a range of methods to minimise our impact on air quality, including using water carts on roads, dust suppressants on roads and stockpiles, sprays on stockpiles, dust suppression on drills and generally limiting disturbance to that required for the next year of operations. In bad weather conditions, such as excessive winds or dust storms, we modify our on-site activities accordingly. We also rehabilitate mined land progressively, to minimise areas exposed to dust generation.

As the severe drought in North West NSW continued throughout FY20, we increased our use of dust suppressants to ensure we continued to meet our overall air quality criteria. We also reviewed and revised haulage routes to minimise the use of water, and established additional supplementary sources of water to ensure adequate air quality management.

All of our operational sites have systems for real-time monitoring to proactively manage our operations. These systems set trigger levels for air quality below approved criteria to allow management actions to be implemented to ensure criteria are not exceeded. Compliance monitoring results are publicly available through applicable CCCs and the Whitehaven Coal and NSW Environment Protection Authority websites.

Almost all of our coal is transported by train. The moisture in coal helps suppress dust, but we take additional steps to reduce dust lift-off. This includes loading trains using the preferred garden-bed profile and, where practical, positioning coal stockpiles to minimise their exposure to dominant winds. We also have automatic wind speed alerts in our Coal Handling and Processing Plants (CHPPs) that trigger air quality inspections. Some coal is trucked to our Gunnedah CHPP; these trucks are covered before they leave the point of loading and remain covered up until the point of delivery, mitigating dust lift-off as they travel on regional roads.

We also voluntarily participate in the Namoi Region Air Quality Monitoring Project. The project's results indicate that air quality in the Namoi Valley is among the best in NSW, a tangible demonstration of our capacity to adhere to the strict dust management controls that apply to mining operations.

Land use and biodiversity

The vast majority of the almost 79,000 hectares of land we own in North West NSW and Queensland is not involved in mining activities; in fact, only about 4.6%, or less than 3,650 hectares, of our land is involved in current mining activities. Where mining activity intersects with agriculture, we aim to put land to productive use, to ensure non-mining land continues to contribute to a diverse local economy. To that end, more than 41,000 hectares of Whitehaven-owned land is currently used for agricultural purposes. This includes land licensed to local farmers for productive agricultural activities such as grazing or cropping. We also lease land to Gunnedah High School for its agricultural department.

We have more than 22,000 hectares of land managed as biodiversity offset areas. These established conservation areas offset impacts that cannot be avoided, managed or mitigated due to the nature of the coal resource. Advice from independent experts and regulators guides how we select and incorporate offset areas into our biodiversity estate, to ensure they represent like-for-like (or better) biodiversity values compared to the area affected by our operations.

Rehabilitation

We progressively rehabilitate mine sites in consultation with relevant stakeholders. The objectives of our rehabilitation include:

- establishing safe, stable and non-polluting landforms
- establishing constructed landforms that incorporate micro-relief patterns consistent with the surrounding topography
- restoring ecosystem functions, including establishing self-sustaining flora ecosystems
- establishing woodland vegetation, grasslands and/or vegetation suitable for agricultural final use
- minimising the visual impact of final landforms as far as is reasonable and feasible.

During FY20, we undertook significant rehabilitation and offset-related work, including:

- rehabilitating 103 hectares of land on mine sites
- planting 106,917 trees in offset areas
- revegetating 1,709 hectares of land in offset areas.

	FY20	FY19	FY18	FY17	FY16
Total land owned (hectares)	79,421	74,499	75,460	67,601	65,430
Total land leased (hectares)	42,144	37,768	32,101	27,920	29,730
Total land leased for agriculture (hectares)	41,721	37,345	31,711	27,572	29,382
Total land disturbed (hectares)	3,636	3,559	3,168	2,942	2,672
Land involved in mining activities (%)	4.6	4.8	4.2	4.4	4.1
Total land rehabilitated in financial year (hectares)	103	133	83	15	103
Total land rehabilitated – cumulative (hectares)	1,087	884	751	668	653
Total land-based biodiversity offset (hectares)	22,087	20,371	20,078	21,741	20,078

Sunnyside mine rehabilitation progress

We concluded mining operations at our Sunnyside mine in FY20, with the site moving into decommissioning and final rehabilitation. This involved bulk earthworks, including overburden haulage into the open cut,

landform shaping, soil placement and spreading.

This work is scheduled to be completed in November 2020. The final landform will have a free-draining void to allow water

to drain away from the void when it rains and into the surrounding landscape. We will return pastures to the flats and woodland to the slopes, to represent the surrounding vegetative communities.

July 2018



July 2020 final stages of backfilling & topsoil spreading



Trialling topsoil alternatives at Maules Creek

Amid one of the driest periods on record in North West NSW, a trial of a topsoil substitute novel to the mining sector has delivered a range of positive environmental outcomes at our Maules Creek mine.

Hydromulch – a biodegradable mix of paper or wood fibres, seeds and fertiliser – creates a hard surface that holds in seeds and nutrients. Hydromulch can be used to create a seed bed in areas where you might not ordinarily be able to have one, and while it is commonly used in civil construction, the mixture is less common in the mining industry.

Hydromulch uniformly distributes seeds and ensures that they bond to the surface, which means they're less likely to be washed away during rainfall or blown away in the wind. It also creates a microclimate conducive to the seed establishing and forming a vegetative cover.

This cover, in turn, helps stabilise slopes. An established topsoil layer, or substitute in the form of hydromulch, has the added benefit of controlling erosion and suppressing dust, particularly relevant during periods of drought.

We wanted to see if hydromulch could be used to establish a topsoil cover on steep slopes where regular topsoil placement may have some potential to experience erosion. Starting in June 2019, we used hydromulch on one part of the steep mine boundary at our Maules Creek mine, then compared that to an adjacent area where we used regular topsoil. The trial area was difficult to access with equipment, and the slope was reflective of the peaks and troughs that will form part of the final landform once mining ends at Maules Creek.

There was no rainfall until February 2020. However, when the rain did fall, vegetation grew in the hydromulch trial area. The hydromulch appeared to protect the vast majority of the seeds.

Hydromulch also limits dirty water run-off, as water isn't flowing over dirt. The hydromulch in the trial created a sealed surface that remained intact until the vegetation began to grow.

These promising early results suggest that hydromulch could be used as a topsoil substitute to stabilise slopes; minimise dust and dirty water run-off; and establish vegetation, particularly during dry periods. We will consider using hydromulch as part of our rehabilitation and other environmental management strategies.

Before



After



Noise management

We are required to comply with stringent noise guidelines set by the NSW Government.

We minimise our noise impacts through a range of measures, including using predictive meteorological systems to plan our operations and deploying sound attenuation on mining equipment. Real-time monitoring also allows us to adapt our activities to minimise noise impacts.

Waste and recycling

We generate various types of waste during exploration, construction, operation and closure activities across our mining facilities.

Our approach to mineral waste management includes segregating and storing overburden and coal reject materials in waste emplacements, which are designed to be safe, stable and non-polluting. Where possible, we segregate recyclable materials and engage specialist contractors to collect and process them.

The Whitehaven Group does not own or operate any active tailings dams.

Compliance

In FY20, we received a Suspension Notice from the NSW Resources Regulator following alleged breaches of conditions of an activity approval for Exploration Licence 6243. Following identification of these alleged breaches, we took immediate corrective action, suspending all exploration activity and commissioning an independent audit and investigation to determine necessary corrective actions, cooperating fully with the Regulator.

We also entered into an Enforceable Undertaking with the NSW Environment Protection Authority, which included payment of \$120,000 to the Environmental Trust, for hazardous waste disposal at the Narrabri landfill.

In FY20, we received a total of \$60,000 in fines relating to eight administrative, noise, water and biodiversity matters.