BHP

Environmental Impact Statement Draft Decarbonisation Plan

Contents

1. Introduction

This Draft Decarbonisation Plan relates to the Saraji East Mining Lease Project (the Project) to be executed by BM Alliance Coal Operations Pty Ltd (BMA). The Project can be described as a single-seam underground mine and supporting infrastructure on Mining Lease Application (MLA) 70383 and MLA 70459 adjacent to, and accessed through, an existing Saraji Mine open cut mine void within Mining Lease (ML) 1775.

This document has been developed at DETSI's request to support the BMA application for environmental approval of the Project.

1.1 The Project

BMA has submitted an Environmental Impact Statement (EIS) under the *Environmental Protection Act 1994* (Qld) (EP Act) for the Saraji East Mining Lease Project situated approximately 30 km north of Dysart and approximately 170 km southwest of Mackay in Queensland.

The Project will access steelmaking coal resources for export of high-quality coking coal and pulverised coal injection (PCI) coal products. The Project will produce up to 8 million tonnes per annum (Mtpa) of product coal to meet current and future market demands for steel production over an anticipated 20-year life of mine.

BMA are seeking approval for the greenfield single-seam underground mine development and supporting infrastructure. The Project will develop surface infrastructure such as a coal handling and processing plant (CHPP), a mine infrastructure area (MIA), a raw water dam, product stockpiles, a rail spur and balloon loop, a conveyor system, and a process water dam as well as construction of an accommodation village. South of the Project site, an overhead powerline will connect to the Dysart Substation. The Project has been designed to use aspects of the existing, and directly adjacent, Saraji Mine infrastructure but will also require new infrastructure and upgrades where appropriate.

Extraction rates are forecasted to produce an estimated 150 Mt run of mine (ROM) coal equivalent to approximately 110 Mt of product coal over 20-year life of mine. ROM coal production is forecast to average 7.5 Mtpa, with a maximum of ≈11 Mtpa, and product coal to average 5.5 Mtpa with a maximum of 8 Mtpa (Figure 1-1).

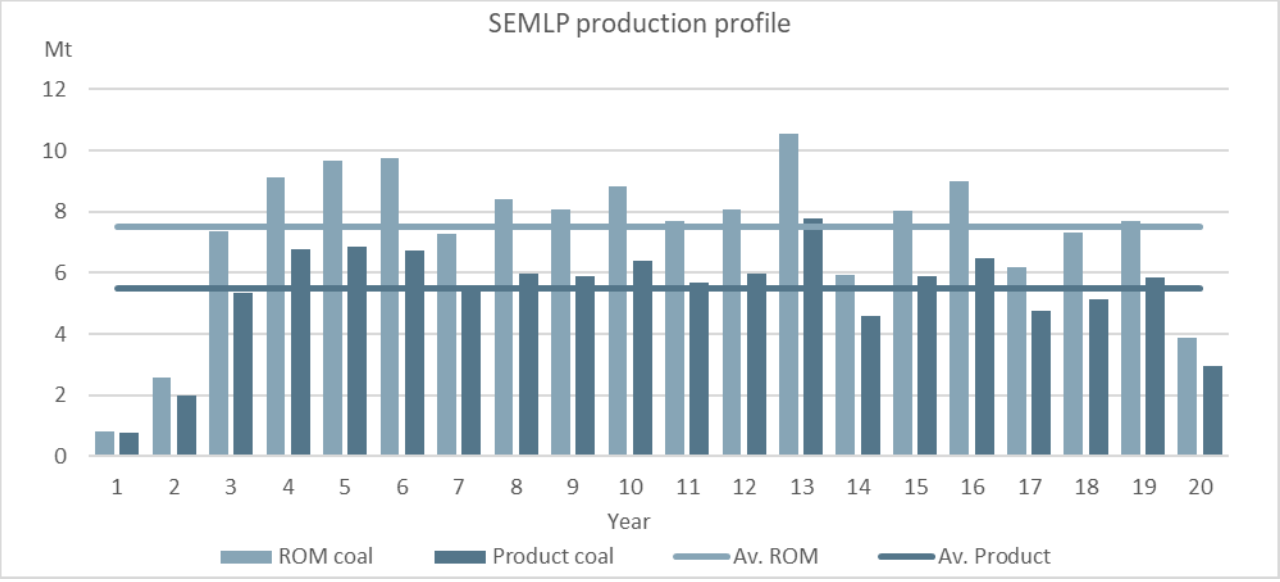

Figure 1-1 Saraji East Mining Lease Project planned production

The key objectives of the Project are to:

- Use BMA-owned land on the adjacent existing Saraji Mine to minimise new disturbance and facilitate Project efficiencies
- Operate a profitable Project providing high-quality hard coking coal, semi-hard coking coal and PCI coal to the export market
- Design, construct and operate the Project to:
  - Minimise adverse impacts on the surrounding bio-physical and social environments
  - Comply with relevant statutory obligations and employ processes to enhance sound environmental management.

The location of the Project and its components is shown in Figure 1-2.

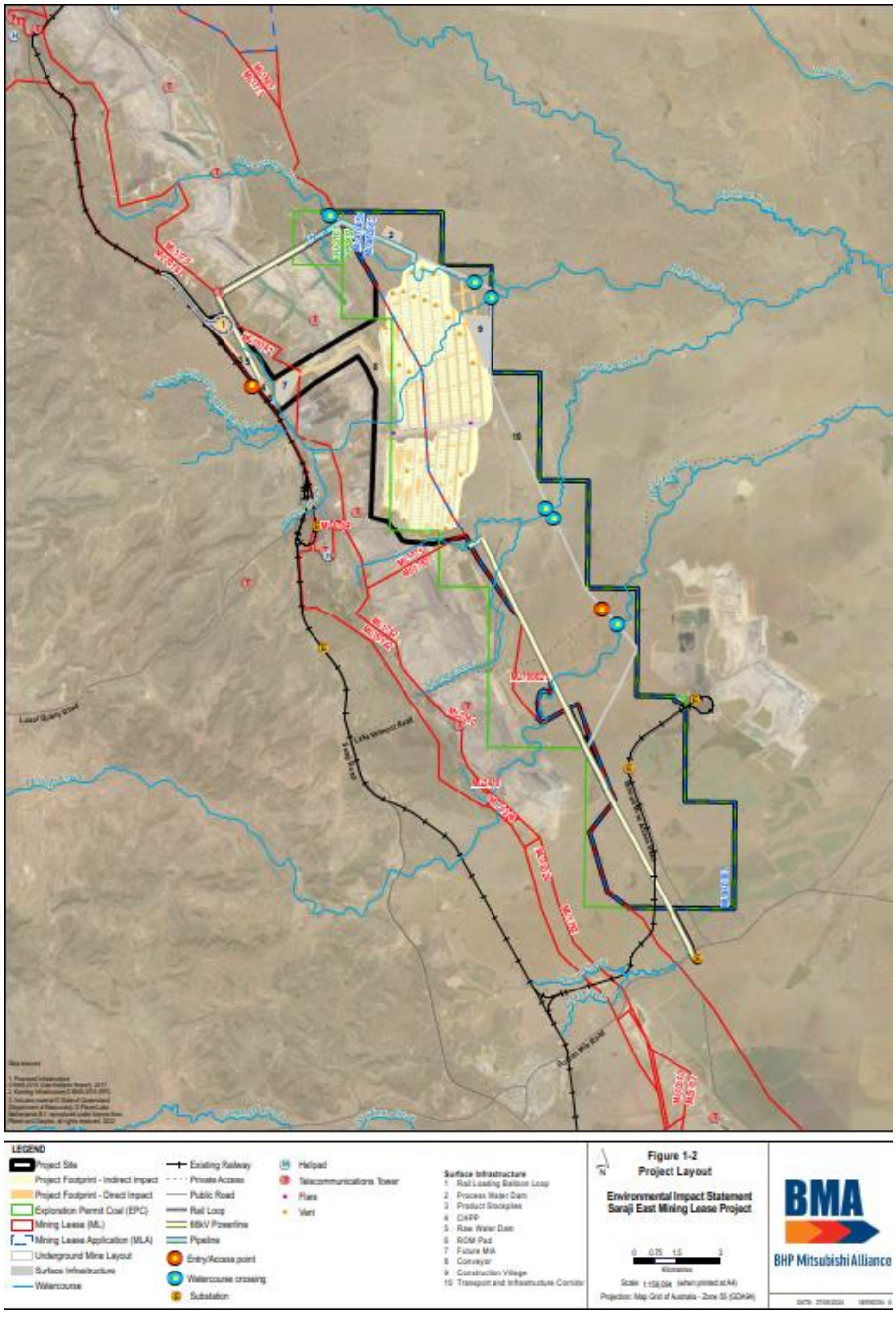

Figure 1-2 Project Location

2. Saraji East Mining Project

2.1 Greenhouse Gas Emission Sources

Greenhouse gas (GHG) emissions relevant to the Project were considered in terms of three 'scope' categories, as follows:

- Scope 1 emissions - Direct GHG emissions from Project operations that are owned or controlled by BMA. For example, fugitive emissions released from the coal seam as coal that are extracted during the production process, or emissions from diesel consumed on site in machinery.
- Scope 2 emissions - Indirect GHG emissions from the generation of purchased or acquired electricity, steam, heat or cooling that is consumed by Project operations that are owned or controlled by BMA. For example, the consumption of electricity by Project infrastructure, where the electricity has been generated outside of the Project Footprint (refer Figure 1-2 Project Location).
- Scope 3 emissions - All other indirect GHG emissions (not included in Scope 2 emissions) that occur in BMA's value chain with respect to the Project. For example, third party emissions from transportation of coal and subsequent use of the coal.

The main sources of Scope 1 emissions from the Project are:

- Direct emissions from diesel fuel combusted by mining equipment.
- Fugitive emissions from the flaring of drained mine gas.
- Fugitive emissions of CH_4 and CO_2 from underground air ventilation.
- Fugitive emissions from post-mining (coal handling and processing) activities.
- Fugitive emissions of CH_4 from the decommissioned mine for up to 20 years post-closure.

Scope 2 emissions are expected to be zero as a result of:

- Existing power purchase agreement (PPA) arrangements that BMA has in place with CleanCo, expected to enable BMA's Queensland assets to have 100 percent of their forecasted operational electricity demand supplied by renewable PPAs from FY2027; and
- BMA's intention to seek to enter similar arrangements to apply after the expiry of the new seven-year PPA commencing from FY2027.

Scope 3 GHG emissions for the Project include:

- Upstream emissions by BMAs suppliers, including in the manufacturing and transport / logistics processes
- Transporting coal by rail to the domestic port for export
- Coal handling at the domestic port, and transportation by ship to the export destinations
- Transporting Project personnel on a fly in fly out (FIFO) basis
- Emissions associated with the end use(s) of product coal.

A breakdown of estimated Scope 1 emissions from the Project's operation phase (20 years) and post-closure decommissioned underground phase (20 years) are presented in Table 2-2 (based on the data and key assumptions in Table 2-1).

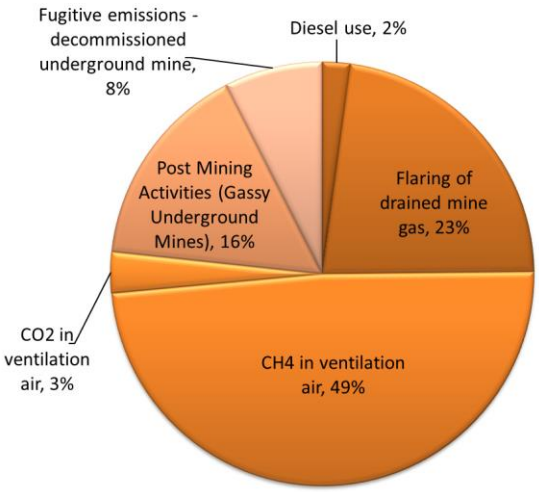

Figure 2-1 Saraji East Mining Lease Project Scopes 1 & 2 emissions share by source

2.1.1 Activity data and key assumptions

Estimates of the annual Project usage of diesel, electricity, incidental mine gas and ventilation air for the lifetime of the Project (operation and decommissioned mine phases) are presented in Table 2-1.

Table 2-1 Estimates of the annual Project usage of diesel, electricity, mine gas and ventilation air

Source	Annual usage	Basis
Diesel	7,102 kilolitres (kL) per year, equating to 142.1 megalitres over 20 years.	Based on proposed mine equipment listed in **Chapter 3**.
Electricity	101.4 gigawatt hours (GWh) per year.	Based on the proposed underground mining and surface coal handling and processing equipment described in **Chapter 3**.
Flaring of drained mine gas (assuming a more beneficial use for the gas is not discovered)	Estimated 3.675 petajoules (PJ) of gas flared per year, equating to 73.5 PJ over 20 years.	BMA estimates of pre-drainage methane and goaf gas.
Fugitive emissions of CH_4 and CO_2 from underground ventilation	(i) Ventilation air methane (VAM) – the greater of: - ventilation air flow of 320 m^3/s @ 0.15% CH_4 v/v; and - 3.0 m^3 CH_4 per ROM coal tonne. (ii) CO_2 – 320 m^3/s @ 0.15% v/v.	Based on proposed mine ventilation rate outlined in **Chapter 3** and maximum VAM target for mine gas drainage.
Post-mining activities associated with gassy underground mines	150 Mt mine-life ROM coal production.	Based on proposed ROM coal production described in **Chapter 3**.
Fugitive emissions from the decommissioned underground mine	Emissions from the mine for the last full year of operation are estimated to be 0.315 Mt CO2-e (excluding flaring and post-mining activities emissions). Emission factors and the proportion of the mine flooded are based on methods in sections 3.32, 3.33, 3.34 and 3.4 of the National Greenhouse and Energy Reporting (NGER) (Measurement) Determination 2008 (August 2024 version) for a period of 20 years.	Estimated in accordance with section 3.32 of the National Greenhouse and Energy Reporting (Measurement) Determination 2008 (August 2024 version).

2.1.2 Incidental Mine Gas

Ventilation air methane (VAM) and drained gas are the largest sources of the Project's estimated Scope 1 operational emissions. In deciding how to manage these sources, BMA will first and foremost comply with section 318CO of the *Mineral Resources Act 1989* (MRA), which imposes restrictions on the flaring and venting of incidental coal seam gas (ISG). It is a condition of ML1775, and will form a condition of any mining lease granted for MLA70383, that:

- Drained gas is used if it is commercially or technically feasible to do so and, failing that, flared if it is safe and technically practicable to do so; and
- VAM is used if it is commercially practicable to do so; and
- Otherwise, the gas may be vented.

BMA is entitled to manage ISG mined from the mineral hydrocarbon mining lease (ML1775) without regard to the holders of overlapping petroleum tenement holders and without restriction on the uses to which the gas may be put. For ISG mined from the area of MLA70383, BMA's options would be subject to the rights of overlapping tenement holders and/or any co-development arrangements in place with those holders and to the types of uses prescribed in section 318CN of the MRA.

2.1.3 Other fugitive emissions

2.1.3.1 Post-mining activities emissions

Post-mining activities GHG emissions are those emitted during the above-ground handling and processing of underground coal from any ("gassy") underground mine with ≥ 0.1% methane in its ventilation air return.

The National Greenhouse and Energy Reporting (NGER) scheme provides only one method for measuring post-mining activities GHG emissions, which involves the multiplication of ROM coal tonnes by a 'default' emissions factor.

2.1.3.2 Emissions from decommissioned underground mine

These are emissions of methane that are deemed to occur for 20 years after underground coal production and ventilation have ceased. The estimate of Project emissions from this source is based on NGER measurement method 1 to reflect the default case in which active monitoring and/or drainage of gas from the mine is not carried out post-closure.

2.1.4 Other minor emissions sources

2.1.4.1 Ventilation air CO_2

Emissions from this source are estimated based on an assumption that carbon dioxide will comprise 0.15% of the ventilation air returns. In practice, a substantial proportion of this gas is expected to present as un-combusted CO_2 in drainage gas.

2.1.4.2 Diesel use

The Project's low estimated diesel use reflects the Project intention for predominantly electrified coal mining, conveying, processing and handling to comprise the bulk of operational activities, which BMA/BHP are seeking to achieve in a timeframe applicable to the Project's commencement. Diesel use would be limited to light vehicles/personnel carriers, small materials and earth moving equipment, generators and pumps, plus some infrequent and short truck haulage of overflow coal to the existing Saraji coal handling and preparation plant.

2.2 Projected GHG Emissions and Energy Use

Estimates of the Scopes 1 and 2 GHG emissions for the Project's diesel usage, electricity consumption, incidental mine gas consumption and fugitive emissions for a 20-year production schedule and 20-year post-closure decommissioned period are presented in Table 2-2.

Table 2-2 Scopes 1 & 2 GHG emissions - 20-year mine production & 20-year decommissioned phase

Scope of emissions	Emissions source	Usage	GHG emissions (t CO_2-e)	Energy content (PJ)
1	Diesel	142 ML	384,915	5.5
1	Flaring of drained mine gas	Nil	4,091,304	73.5
1	CH_4 in ventilation air	206 kilotonnes	8,780,340 CH_4	NA
1	CO_2 in ventilation air	564 kilotonnes CO_2	563,410	NA
1	Fugitive emissions from post-mining activities associated with gassy underground mines	150 Mt	2.850,000	NA
1	Fugitive emissions from the decommissioned underground mine	20 years post closure	1,354,300	NA
2	Electricity consumption	2,028 GWh	0	7.3
	TOTAL		**18,024,269**	**86.3**

The operational phase of the Project is estimated to result in approximately 16.7 Mt $CO_{2\text{-}e}$ of Scope 1 and Scope 2 GHG emissions over the 20-year production schedule, equivalent to 0.83 Mt $CO_{2\text{-}e}$ per year. Post-closure, a further 1.4 Mt $CO_{2\text{-}e}$ (68 kt $CO_{2\text{-}e}$ pa) is estimated to be emitted as fugitive emissions from the 20-year decommissioned underground mine phase of the Project.

3. Draft Decarbonisation Plan

3.1 BHP Climate Transition Action Plan (2024)

BHP believes that warming of the climate is unequivocal, the human influence is clear and physical climate-related impacts are unavoidable, and that the world must continue to increase both the levels of ambition and pace of GHG emissions reductions to meet the aim of the Paris Agreement.. To play its role in helping to address this ongoing and global issue, BHP developed and published its original Climate Transition Action Plan (CTAP) in 2021, and produced its second CTAP in 2024. BHP's CTAP sets out its climate change strategy, commitments, targets and goals, and forward-looking plans, including a strategic approach to reduce GHG emissions within its own operations and to work with customers and suppliers to support their emissions reductions in the value chain.

BHP engaged with stakeholders in the development of its CTAP (2024), which reaffirms the company's intent to play its part in the global effort to achieve the world's net zero ambitions – producing more of the essential commodities the world needs to develop and decarbonise; investing to reduce BHP's operational GHG emissions; and collaborating to support lower GHG emissions in the value chain.

As part of the CTAP (2024), BHP is investing in renewable energy and electric mining equipment charging technology for decarbonisation of its own operations and supporting initiatives to advance decarbonisation of maritime and steelmaking industries. BHP's CTAP sets out how and when it may use voluntary and regulatory carbon credits, including its expectations in relation to how offsetting from customers, suppliers and other third parts will play a role in decarbonisation in the value chain.

Pursuant to the governance and operational arrangements agreed for the joint venture, BMA has adopted certain structures, policies, standards and processes of the BHP Group with respect to BMA's operations and supply chains. Accordingly, BHP's operational and environmental management framework, including BHP's climate change strategy, targets and goals and plans within the CTAP (2024) apply to the Project.

For its operational GHG emissions (Scopes 1 and 2 emissions from its operated assets) BHP has set:

- A medium-term target to reduce operational GHG emissions by at least 30 per cent by FY2030 from an FY2020 baseline; and
- A long-term goal to achieve net zero operational GHG emissions by FY2050.

Further information, including in relation to BHP's Scope 3 targets and goals, is available in its CTAP 2024.

3.2 BMA Initiatives

The key objectives of BMA's Draft Decarbonisation Plan is to support Queensland's decarbonisation transition and contribute towards BHP's medium-term target and long-term goal for operational GHG emission reductions.

BMA operates a number of assets across the Bowen Basin as well as the Hay Point Coal Terminal near Mackay and, as such, initiatives and opportunities to reduce GHG emissions are generally approached collectively by the business (rather than by siloed operation/project).

3.2.1 Emission Prevention through Efficient Project Design

The following Project design considerations are relevant for the Project to minimise GHG emissions during operation:

- Preferencing fuel efficient mining equipment during procurement.
- Maintaining mining equipment in good working order that so fuel efficiency is maximised.
- Using appropriately sized equipment.
- Consideration of gas drainage and abatement of incidental mine gas including options for flaring, on-site use or for third-party off-site use.

3.2.2 Emission Abatement – Scope 1 Diesel Emissions

BHP's proposed approach to minimise Scope 1 diesel emissions are as follows:

- Transition from diesel to electricity energy source. Haul trucks and other ancillary equipment are the largest user of diesel and electrification has been identified as a potential pathway (technology is still in the development phase) to decrease diesel-related emissions.
- BHP is collaborating with vendors and industry worldwide to accelerate development of electrification technologies.
- Technical solutions to meet power demand are being developed in parallel. This includes planning for renewable generation, understanding storage capacity and options for interconnection with grids.

3.2.3 Emission Abatement – Scope 1 Fugitives

3.2.3.1 Ventilation air methane

BMA will consider the application of VAM abatement techniques, subject to the following pre-conditions:

- Demonstration of the safe operation of the technology at scale in Australia and its acceptance by coal mining industry regulators and other affected stakeholders.

  It is significant that, despite decades of Australian coal industry leadership in VAM abatement research and development, there are no examples of the technology currently in operation in this country. To date, applications of VAM abatement at scale have been few and limited to overseas jurisdictions with different regulatory regimes and, arguably, different safety standards to Australia.

  The coal industry, through Low Emissions Technology Australia (LETA), are working with candidate operators to demonstrate safe application of the technology at scale. The outcomes of these efforts will be a key consideration in BMA's future assessment of VAM abatement for the Project.

- Further research into and demonstration of abatement systems capable of sustained operation at sufficiently low levels of VAM concentration. At this stage, the concentration of CH_4 in ventilations air is expected to range between 0.15% and 0.30% depending on the rate of ROM coal production. This is below the minimum concentration level capable of current sustaining thermal oxidisation units and on the cusp of that required for self-sustaining catalytic reactors which are at a lower technology-readiness level.

BMA will follow the above developments closely and incorporate any leanings into the feasibility and Project definition studies that will be key stage-gates towards a final investment decision.

3.2.3.2 Flaring of drained mine gas

The Project's emissions estimates assume 100% flaring of gas captured through pre-mine and goaf gas drainage.

As noted above under 2.1.2, flaring of drained gas would be carried out as a minimum where it was safe and technically practicable to do so in accordance with the MRA.

Alternative beneficial uses of the gas will be considered in the feasibility and definition phase studies leading up to execution of the Project.

3.2.3.3 Other fugitive emissions

Post-mining activities emissions and emissions from the decommissioned underground mine are based on NGER method 1 measurements and, therefore, not amenable to abatement.

3.2.4 Safeguard Mechanism Compliance

Scope 1 emissions from the Project's construction and operations on ML1775 will be part of Saraji's 'existing facility' emissions under the Safeguard Mechanism, and those from activities on MLAs 70383/70459 are likely to be also treated as such (although this remains subject to confirmation). Regardless, BMA will comply with the Safeguard Mechanism and, as the 'responsible emitter', BMA will:

- Surrender the required number of ACCUs, Safeguard Mechanism credit units and/or other 'prescribed carbon units' to offset 'excess emissions' above Saraji/Saraji East's baseline(s)
- Provide an explanatory statement to the Clean Energy Regulator (CER) if/when we surrender ACCUs equal to or more than 30% of the Project's Safeguard Mechanism baseline. Any such statement will fulfil the explanation requirements in the National Greenhouse and Energy Reporting (Safeguard Mechanism) Rule 2015 and will be publicly available via the CER's website.

3.2.5 Emission Abatement – Scope 2 Electricity Emissions

BMA expects to have eliminated its Scope 2 emissions by FY2027 through the execution of renewable power purchase agreements with CleanCo. Based on currently forecast demand, additional electricity requirements from the Project is intended to be met by renewable power, either under the existing PPA arrangements BMA has in place, or consistent with BMA's intention to seek to enter similar arrangements after the expiry of the new seven-year PPA commencing from FY2027.

3.3 Implementation and Review

GHG emission estimates and mitigation measures will be further refined in future studies of the Project.

Emissions abatement will be progressively more fully integrated with the BHP/BMA decarbonisation planning framework and GHG reporting will be undertaken in accordance with the relevant legislation.