

Loch Kemp Storage - EIA Report

Appendix 18.1: Dust Monitoring Scheme

November 2023

ash



ash design + assessment
Suite 2/3, Queens House
19 St Vincent Place
Glasgow, G1 2DT

Tel: 0141 227 3388
Fax: 0141 227 3399

Email: info@ashglasgow.com

Web: www.ashdesignassessment.com

Appendix 18.1: Dust Monitoring Scheme

- 1.1.1 Monitoring is recommended to monitor the dust deposition levels within Ness Woods Special Area of Conservation (SAC) and Easter Ness Forest Site of Special Scientific interest (SSSI). Monitoring of dust deposition should commence a minimum of 6 months prior to the start of any construction works onsite to establish baseline levels and remain throughout the construction period.
- 1.1.2 Monitoring during the first 12 months of construction is proposed to be more comprehensive to allow for collection of data on the dispersion of dust at increasing distances from the onsite tracks. Data from the first 12 months could then be utilised to ascertain the effectiveness of the mitigation measures and dictate the location of monitors for the remaining monitoring period.
- 1.1.3 The proposed monitoring locations are indicative and subject to change following consultation with THC and site management, health and safety issues, access and security.

Initiative Monitoring Locations

Baseline Monitoring

- 1.1.4 Monitoring at two locations within the SAC / SSSI would be undertaken for a minimum period of 6 months prior to the commencement of construction activities. One monitor would be placed within an open, heath / grassland habitat with the second monitor being placed in a woodland habitat to ensure representative baseline deposition rates are acquired for habitats of both low and high stature.

Months 1 to 12

- 1.1.5 During the first 12 months of construction activities, thirteen monitoring locations have been proposed in order to represent the various habitats and sensitivities within the SAC / SSSI in addition to collecting data on the dispersion of dust across the SAC from the primary dust sources (i.e. access track & powerhouse area). The proposed locations are presented in **Table 18.2A: Monitoring Transects Locations (Months 1 to 12)** and **Figure 18.1.1a: Monitoring Locations**. A confidential version of this Figure (**Confidential Figure 18.1.1b: Monitoring Locations**) which contains information on otter (*Lutra lutra*) is provided in the Confidential Appendix¹.
- 1.1.6 The monitoring locations have been proposed based on consultation with the appointed ecologists to ensure that the habitats of greatest sensitivity have been represented and that spatial constraints such as avoiding areas of qualifying habitat (see **Figure 18.1.1a: Monitoring Locations**). Otter laydowns have also been taken into account to minimise disruption (see **Confidential Annex, Confidential Figure 18.1.1b: Monitoring Locations**¹). One background monitor would be located within the SAC / SSSI at a minimum distance of 250 m from any construction activities. Whilst an upwind (prevailing) location would be recommended for the background monitor, access, security and health and safety may limit the location to within the Site boundary.

¹ Note that this figure will not be publicly available as it contains sensitive information relating to otter. It is included in the Confidential Annex which is provided to relevant consultees.

Table 18.2A: Monitoring Transects Locations (Months 1 to 12)

Monitor	Closest Dust Source (m)	Upwind / Downwind (prevailing)	Primary Habitat
M1	Access Track (15m)	Upwind	Acid Grassland
M2 – M5	Access Track (1-100m)	Downwind	Bracken
M6 – M9	Power House (1-100m)	Downwind	Broadleaved Woodland
M10	Access Track (10m)	Downwind	Broadleaved Woodland with 'Very High Interest' Lichens
M11	Access Track (10m)	Downwind	Bracken with 'Very High Interest' Lichens with 'Very High Interest' Lichens
M12	Dam 1	Downwind	Broadleaved Woodland
M13	Background Location	N/A	Dry Heath / Bracken

Months 13 to 59

- 1.1.7 Following the initial 12 months monitoring, a review of the results would be undertaken with the view to reduce the monitors during the remaining construction period, if appropriate. For example, the monitors at 1 m and 20 m of the respective transects would remain if results show dust deposition levels to be consistently below the relevant criteria at greater distances. The background monitor would remain. Any amendments to the monitoring locations would need to be approved by THC.

Methodology

- 1.1.8 The sampling equipment will be placed at the sampling points identified on the dust monitoring location plan (**Figure 18.1.1a**) unless site circumstances indicate that this would not enable a representative sample to be collected. Circumstances which might be encountered include overhanging trees, a change in the site access road location, etc. If this occurs advice will be sought from the site manager as to whether re-locating the monitoring point would be appropriate or whether the monitoring equipment will be set up in the original location or the monitoring abandoned for that point. If it is decided to continue with the monitoring at that point a note will be made to aid with interpretation of anomalous results.
- 1.1.9 Dust deposition gauges will be set up in safe areas, labelled and pegged down or secured to prevent them from being blown over in bad weather. Site staff will be advised to check them on a regular basis to ensure that they do not become unstable due to bad weather conditions or any other reason.
- 1.1.10 Deposited dust and surface soiling will be monitored using dust deposition gauges fitted with adhesive directional dust samplers around the exterior. The samples will be collected on a fortnightly basis and sent to a UKAS accredited laboratory.
- 1.1.11 The dust deposition samples would be sent off to a UKAS accredited laboratory and analysed for the following:

- Mass of dissolved and undissolved solids to determine deposition rate as mg/m²/day using Method No.FD0: The determination of Fugitive Dust based on BS 872:2005 (mass of dust (mg) is the UKAS accredited test); and
 - % Effective Area Covered (EAC) to determine surface soiling and direction of impact using Method No. FD05: The determination of reflectance values using a smoke stain reflectometer (% reflectance is the UKAS accredited result reported).
- 1.1.12 The gauges will be exchanged on a monthly frequency by a trained member of staff and will follow the protocol listed below:
- Liaise with the laboratory to obtain clean sample bottles in advance of sample collection.
 - Ensure replacement bottles are clearly and correctly labelled with the 'Location ID' and 'sample collection period (start/end)';
 - Upon arrival to a gauge location, check the gauge for any signs of disrepair or dislodgement;
 - If there are deposits of dust settled on the gauge capture dish carefully direct the dust down into the sample bottle using a small brush and de-ionised water;
 - On removal of the exposed sample bottles and adhesive strips ensure correct labelling;
 - Install replacement bottle and adhesive strips; and
 - Deliver the samples and supporting documents promptly to the UKAS accredited laboratory for analysis.

Relevant Limits

- 1.1.13 Interim Advice Note (IAN) prepared as a supplement to the Design Manual for Roads and Bridges² suggests that only dust deposition levels above 1000 mg/m²/day are likely to affect sensitive ecological receptors. This level of dust deposition is approximately five times greater than the level at which most dust deposition may start to cause a perceptible nuisance to humans. Furthermore, it is stated that most species appear to be unaffected until dust deposition rates are at levels considerably higher than this³.

Reporting

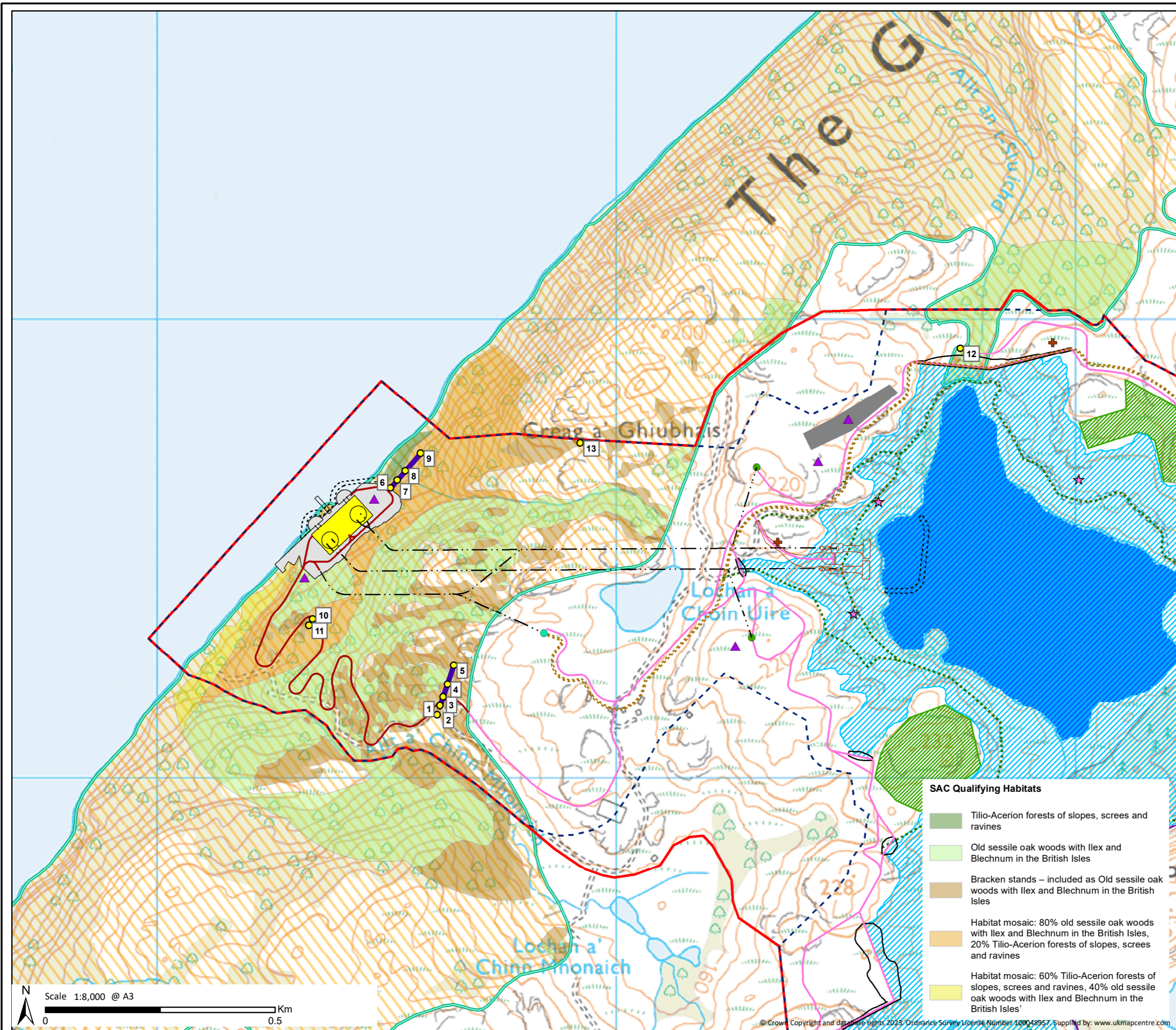
- 1.1.14 Deposited dust and surface soiling results for each gauge will be received from the laboratory undertaking the analysis and collated in order to assess areas in which deposited dust and surface soiling are above the thresholds.
- 1.1.15 If the deposition rates (mg/m³/day) are above the relevant threshold, directional surface soiling data will be consulted to determine the likely direction from which the dust is originating. If directional data indicates that deposited dust was likely to have originated from the site, then site management

² Design Manual for Roads and Bridges, Volume 11, Section 3, Part 1, HA207/07, Annex F

³ Farmer A.M. (1991) The Effects of Dust on Vegetation – A Review. Environmental Pollution 79. Pp 63-75

would look at operational schedules and activities to determine and resolve any causes of significant dust generation.

- 1.1.16 Monthly internal reports will be produced displaying deposited dust rates and directional data for each monitoring location. If exceedances are found, a summary document with conclusions as to potential sources of dust and any reactive actions taken to reduce concentrations will be created. A summary letter of results would be submitted to THC at the end of each calendar year.



- Key**
- Site Boundary
 - Development Area
 - Loch Kemp Surface Area (Existing)
 - Maximum Inundation Area (Upper Reservoir)
 - Powerhouse Building
 - Powerhouse Platform, Quayside and Pier
 - Temporary Laydown Area
 - Underground Tunnel
 - Dam
 - Temporary Cofferdam
 - Construction and Operational Access Track (4m Wide Running Surface)
 - Construction and Operational Access Track (8m Wide Running Surface, Reinstated to 4m where feasible)
 - Construction and Operational Access Track within SAC
 - Temporary Construction Access Track (8m Wide Running Surface)
 - Inlet/Outlet Structure
 - Surge Shaft
 - Cable Shaft
 - + Control Kiosk
 - ▲ Temporary Site Compound
 - ★ Potential Borrow Pit

- Associated Works**
- 275 kV Cable Trench*
- *Associated works subject to separate consent. Footprints show indicative locations / routes only

- Designations**
- Special Area of Conservation (SAC)
 - Site of Special Scientific Interest (SSSI)

- Air Quality - Monitoring**
- Monitoring Transect
 - Monitoring Locations

- SAC Qualifying Habitats**
- Tilio-Acerion forests of slopes, screes and ravines
 - Old sessile oak woods with Ilex and Blechnum in the British Isles
 - Bracken stands – included as Old sessile oak woods with Ilex and Blechnum in the British Isles
 - Habitat mosaic: 80% old sessile oak woods with Ilex and Blechnum in the British Isles, 20% Tilio-Acerion forests of slopes, screes and ravines
 - Habitat mosaic: 60% Tilio-Acerion forests of slopes, screes and ravines, 40% old sessile oak woods with Ilex and Blechnum in the British Isles

Scale 1:8,000 @ A3

0 Km 0.5

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**Figure 18.1.1a
Air Quality Monitoring Locations**

Drawn by SK/UM Date: 16/11/2023
Drawing: 120019-D-EIA-18.1.1a-1.0.0

**Loch Kemp
Storage**

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