

BHP/CEM/23/A

Analysing
Testing
Consulting
Calibrating

TECHNICAL REPORT

BHP

Client:

**Patton Brothers
Gortletteragh
Stranolar
Co.Donegal**

**BHP Ref No.: 83741
Order No.:
Date Received: 28th October 2008
Date Tested: 30th October 2008
Test Specification: Nil**

BHP
New Road
Thomondgate
Limerick
Ireland
Tel +353 61 455399
Fax + 353 61 455447
E-Mail bhpcem2@bhp.ie

FAO Tony Patton

Item: Dust deposition results for monitoring period October 2008 using Dust deposit gauges as per VDI 2119 Part 2, at the Patton Brothers operation located at Gortletteragh, Stranolar, Co.Donegal.



For and on behalf of BHP Ltd.

**Pat O'Sullivan
Date Issued: 31st October 2008
Supplement to report No. N/A**

Test results relate only to this item. This test report shall not be duplicated except in full and with the permission of the test laboratory.

Glossary

- 1.0 Introduction
- 2.0 Sampling
 - 2.1 Sampling locations
 - 2.2 Quality control system
- 3.0 Results
- 4.0 Conclusions
- 5.0 References

Appendix 1 Site map showing sampling locations.



1.0 Introduction

At the request of Patton Brothers, Gortletteragh, Stranolar, Co. Donegal, BHP conducted a dust-monitoring programme at their operation in Gortletteragh, Stranolar, Co. Donegal.

All sampling and analysis was conducted in accordance with Germany Standard VDI 2119 using Bergerhoff dust deposition gauges. Details of sampling procedures are given in the bulk of the report.

The EPA Publication 'draft guidelines on the information to be contained in environmental impact statements' has been used as a reference for this report.

2.0 Sampling

The sampling was carried out in accordance with VDI 2119 Part 2 using Bergerhoff dust deposition gauges. The gauges were in place from the 29th of September 2008 to the 28th of October 2008.

2.1 Sampling Locations

The gauges were all placed at ground level. The locations of the sampling sites are presented in appendix 1.



2.2 Quality Control

The Chemical and Environmental Monitoring laboratory (CEM) operates a rigorous approach to quality assurance. The central elements of the quality control system are outlined.

a) Chain of Custody and Client Instruction

Every sample received at BHP laboratories is inspected by the laboratory manager Pat O'Sullivan or by site manager Paul O' Sullivan.

A client instruction is required to start analysis.

All samples are then given a unique BHP reference number before storage between 0 and 4°C.

b) Training and Competence

All analysts conducting work at BHP are fully trained. Training involves demonstration of accuracy and precision of analysis. All analysts are subject to periodic reviews in their training. All training is fully documented and retrievable.

c) Validation

BHP procedures are subjected to a rigorous validation which includes the following;

- Evaluation of instrument detection limits and limits of detection.
- Evaluation of operator characteristics including bias, precision and uncertainty of measurement.
- Demonstration of Linearity.
- Evaluation of the standard error on the mean and evaluation of any systematic biases.
- Evaluation of total uncertainty and uncertainty budgets.
- Evaluation of the uncertainty in measurement at a regulatory limit.
- Demonstration of repeatability.
- Evaluation of Matrix effects.



d) **Quality Control (Skewhart) Charts**

Analysis in the CEM laboratory is monitored using control charts. Each analysis will have at least 3 charts monitoring;

- Certified Reference Material recovery
- Precision of analysis
- Accuracy of analysis

Batches of analyses are rejected if any of the control charts indicate a loss in control.

e) **Interlaboratory Testing**

The CEM laboratory are members of the W.R.C Aquacheck Scheme. The Laboratory also participates in the Environmental Protection Agency's Intercalibration Programme and is listed on the Agency's Register of Quality Approved Testing Laboratories.

The Laboratory participates on a bi-annual basis in the British Gas Interlaboratory Proficiency Schemes for the analysis of contaminated soils and waters.



3.0 Results

The results are presented in the following table.

Monitoring Station	Deposition (mg/m ² /day)
1	280
2	35
3	62.2

4.0 Conclusions

The dust deposition levels at all locations are below the usual EPA guideline of 350 mg/m²/day deposition at all locations.

5.0 References

- 1) Draft Guidelines on the information to be contained in environmental impact statements, 2nd Report 1998, Environmental Protection Agency.
- 2) Measurement of Particulate Precipitations: Determination of Dust Precipitation with collecting pots made of glass (Bergerhoff Method) or Plastic: VDI 2119: Part 2.
- 3) Environmental Engineers Handbook, Second Edition, David H.F. Liu and Bela G. Liptak, Lewis, 1996.
- 4) Standard Methods for the examination of water and wastewater, 20th Edition, published by the American Public Health Association, 1998.



Appendix 1

Site Map showing Dust Monitoring Locations

