



VCS VERIFICATION REPORT

CONVERSION OF SF₆ TO AN ALTERNATE COVER GAS IN MAGNESIUM PRODUCTION IN EATON RAPIDS, MI AND STRATHROY, ON PROJECT

MONITORING PERIOD:
01-JANUARY-2011 TO 31-DECEMBER-2011

REPORT N° 2012-9335
REVISION NO. 01



ANSI ACCREDITED PROGRAM
GREENHOUSE GAS VERIFICATION

0981

Project Title	Conversion of SF ₆ to an Alternate Cover Gas in Magnesium Production in Eaton Rapids, MI and Strathroy, ON Project
Version	01

Report Title	VCS Verification Report for Conversion of SF ₆ to an Alternate Cover Gas in Magnesium Production in Eaton Rapids, MI and Strathroy, ON Project
DNV Ref.	PRJC-385501-2012-CCS-USA
Client	Climate Change Capital
Pages	38
Date of Issue	21-June-2012
Prepared By	Det Norske Veritas (U.S.A.), Inc.
Contact	1 Bush Street, 12 th Floor, San Francisco CA 94109 USA Tel: +1 415 318 3912 Email: climatechangena@dnv.com http://www.dnv.com
Approved By	
Work Carried Out By	Sheryl Lawry / Barbara Toole O'Neil
Technical review by:	John Warmerdam / Weidong Yang

Summary:

Det Norske Veritas (U.S.A.) Inc., (DNV) has performed the verification of the emission reductions reported for the “Conversion of SF6 to an Alternate Cover Gas in Magnesium Production in Eaton Rapids, MI and Strathroy, ON Project” (VCS Project ID: 618) for the period 01-January-2011 to 31-December-2011, to review and determine the monitored reductions in GHG emissions that have occurred as a result of the project activity.

The verification was performed on the basis of VCSA Programme Guidelines version 3.2 & Standard version 3.2 for the VCS projects, as well as criteria given to provide for consistent project operations, monitoring and reporting. The verification was conducted by means of document review, follow-up interviews and site inspection, and the resolution of outstanding issues.

In our opinion, the GHG emission reductions reported for the project in the monitoring report (version 01) of 21-June-2012) are fairly stated. The GHG emission reductions were calculated correctly on the basis of approved CDM methodology No AM0065 (version 02.1) and in the VCS PD of 9 Mar 2009.

Hence, Det Norske Veritas (U.S.A.) Inc., (DNV) is able to certify that the emission reductions from the “Conversion of SF6 to an Alternate Cover Gas in Magnesium Production in Eaton Rapids, MI and Strathroy, ON Project” during the period amount to 186,584 tonnes CO₂ equivalent (Michigan, U.S.) and 20,958 tonnes CO₂ equivalent (Ontario, Canada).

DNV does not assume any responsibility towards the issuance and utilization of the VCU's hereby verified and certified. Request for issuance of VCU's shall be made by the project proponent to an approved VCS Program Registry based on the requirements set out under the most recent version of the VCS Program Guidelines clause on VCS Registration.

The verification of reported emission reductions is based on the information made available to DNV and the engagement conditions detailed in this report. DNV cannot be held liable by any party for decisions made or not made based on this report.

Table of Contents

Contents

ABBREVIATIONS.....	IV
1 INTRODUCTION	6
1.1 OBJECTIVE.....	6
1.2 SCOPE AND CRITERIA	6
1.3 LEVEL OF ASSURANCE.....	7
1.4 SUMMARY DESCRIPTION OF THE PROJECT.....	7
2 VALIDATION PROCESS, FINDINGS AND CONCLUSION.....	8
3 VERIFICATION PROCESS.....	8
3.1 METHOD AND CRITERIA.....	8
3.2 SITE INSPECTIONS & INTERVIEWS	9
3.3 RESOLUTION OF ANY MATERIAL DISCREPANCY	10
3.3.1 SUMMARY OF THE CARs, CLs AND FARs IDENTIFIED.....	11
4 VERIFICATION FINDINGS	11
4.1 PROJECT IMPLEMENTATION STATUS	11
4.2 ACCURACY OF GHG EMISSION REDUCTION OR REMOVAL CALCULATIONS.....	21
4.3 QUALITY OF EVIDENCE TO DETERMINE GHG EMISSION REDUCTIONS OR REMOVALS.....	22
4.4 MANAGEMENT AND OPERATIONAL SYSTEM.....	24
5 VERIFICATION CONCLUSION	26
6 REFERENCES	28
APPENDIX A.....CORRECTIVE ACTION REQUESTS, CLARIFICATION REQUESTS AND FORWARD ACTION REQUESTS	

ABBREVIATIONS

CAR	Corrective Action Request
CCC	Climate Change Capital
CF	Conservative Factor
CDM	Clean Development Mechanism
CL	Clarification Request
CO ₂	Carbon Dioxide
CO ₂ e	Carbon Dioxide Equivalent
DNV	Det Norske Veritas
FARs	Follow-up Action Requests
GHG	Greenhouse Gas(es)
GWP	Global Warming Potential
IPCC	Intergovernmental Panel on Climate Change
MFC	Mass Flow Controllers
Mg	Magnesium
NGO	Non-governmental Organization
PD	Project Document
SO ₂	Sulfur Dioxide
SF ₆	Sulfur Hexafluoride
tCO ₂ e	Metric tonnes CO ₂ equivalent
VCS	Verified Carbon Standard

VCS PD	Verified Carbon Standard Project Document
VCU	Verified Carbon Unit
VER	Verified Emission Reduction

1 INTRODUCTION

Climate Change Capital (CCC) has selected Det Norske Veritas (U.S.A.) Inc. (DNV) to verify the emission reductions reported for the “Conversion of SF₆ to an Alternate Cover Gas in Magnesium Production in Eaton Rapids, MI and Strathroy, ON Project” (the project) for the period 01-January-2011 to 31-December-2011. CCC is the project developer. Meridian Magnesium Products (Meridian) is the owner and operator of two magnesium die casting facilities, located in Eaton Rapids, Michigan, USA, and Strathroy, Ontario, Canada. Meridian is responsible for monitoring, measurement and reporting activities including submission of monitoring reports to CCC. Mr. Brian Jones of M.J. Bradley & Associates LLC is the project consultant for CCC. This report contains the findings from the verification and includes a verification statement for the verified emission reductions (VER).

1.1 Objective

Verification is the periodic independent review and ex-post determination by an accredited verification body of the monitored reductions in GHG emissions that have occurred as a result of the project activity registered with the Verified Carbon Standard (VCS) during a defined verification period.

A verification statement is the written assurance by a verification body that, during a specific period in time, a project activity achieved the emission reductions as verified.

The objective of this verification was to verify and provide a verification statement of emission reductions reported for the “Conversion of SF₆ to an Alternate Cover Gas in Magnesium Production in Eaton Rapids, MI and Strathroy, ON Project” for the period 01-January-2011 to 31-December-2011.

1.2 Scope and criteria

This project has been validated and registered under the VCS. 2011 is the fourth verification year for this project. The scope of the verification is:

- To verify that actual monitoring systems and procedures are in compliance with the monitoring systems and procedures described in the monitoring report.
- To evaluate the GHG emission reduction data and express a conclusion with a reasonable level of assurance about whether the reported GHG emissions reduction data is free from material misstatement.
- To verify that reported GHG emissions data is sufficiently supported by evidence.

The criteria of the verification are:

- VCS Standard version 3.2 /15/

- VCS Program Guide version 3.2 /16/
- The approved methodology No AM0065 (version 02.1) /13/

The verification shall ensure that reported emission reductions are complete and accurate in order to be verified.

1.3 Level of assurance

The verification report expresses a conclusion with a reasonable level of assurance about whether the reported GHG emissions reduction data is free from material misstatement. DNV applied a materiality threshold of 5% with respect to omission or misstatements concerning reported quantities as per VCS Standard.

1.4 Summary description of the project

Title of project activity:	Conversion of SF ₆ to an Alternative Cover Gas in Magnesium Production in Eaton Rapids, MI and Strathroy, ON
Project ID:	618
Methodology	Approved methodology No AM0065 (version 02.1)
Location of the project activity:	Meridian Magnesium Products locations as follows: <i>2001 Industrial Drive, Eaton Rapids, MI 48827 USA</i> <i>155 High Street East, Strathroy, ON N7G 1H4 ,Canada</i> <i>800 Wright Street, Strathroy, ON N7G 4H7, Canada</i>
Project's crediting period:	1 January 2007 to 31 December 2016
Period verified in this verification:	01-January-2011 to 31-December-2011

Meridian is the owner and operator of two magnesium die-casting facilities, located in Eaton Rapids, Michigan, USA, and Strathroy, Ontario, Canada. Meridian is responsible for monitoring, measurement and reporting activities including submission of monitoring reports to CCC. Prior to the project start, Meridian used SF₆ as a protective 'cover gas' to prevent oxidation of its molten magnesium by oxygen in ambient air. There are various protection systems commonly used in the production and casting of magnesium metal to prevent oxidation, however most use gaseous components with high GWP values, such as SF₆. SF₆ is a non-reactive gas and is therefore ideally suited to be used as a protection 'covering' for molten magnesium (hence the term 'cover gas').

The project has been operational since 1st January 2007 when the ongoing project switched the cover gas from SF₆ to Novec-612TM (C₂F₅COC₃F₇), used also in combination with SO₂. Novec-612TM is a recently-patented gas by 3M, which has not been used commercially in the US or Canada prior to this project.

The Novec-612™ and SO₂ performs the same function as the SF₆ to prevent magnesium metal from reacting with oxygen in air. The purpose of the project activity is to replace all SF₆ used as a cover gas with an alternate cover gases that have a lower global warming potential, thus reducing GHG emissions to the atmosphere.

2 VALIDATION PROCESS, FINDINGS AND CONCLUSION

The Conversion of SF₆ to an Alternate Cover Gas in Magnesium Production in Eaton Rapids, MI and Strathroy, ON Project is currently in the fourth year of verification, and has been registered as a VCS project, VCS Reference Number: 618. Validation was completed in 2008 and there is no requirement for further validation prior to this verification.

3 VERIFICATION PROCESS

3.1 Method and criteria

The verification was performed through means of the following three phases in accordance with the requirement of the registered Monitoring Report, the applied methodology, and the VCS Standard, version 3.1 and other relevant VCS requirements.

- A desk review of the monitoring report and all supporting documents.
- Follow-up interviews with project stakeholders and a site inspection.
- The resolution of outstanding issues and the issuance of the verification report and statement.

The verification of the emission reductions has assessed all factors and issues that constitute the basis for emission reductions from the project. These include:

- The emission reduction calculations and the relevant data records.
- The calibration and maintenance records for the monitoring instruments.
- The management systems to support the project operation and monitoring.

Table 1 below outlines the verification team assigned for this project.

Table 1: Verification team

Role	Last Name	First Name	Type of involvement				
			Desk review	Site visit	Reporting	Supervision of work	Technical review
Team leader & verifier	Toole O'Neil	Barbara	✓	✓		✓	
Verifier (under training)	Lawry	Sheryl	✓		✓		
Technical reviewer	Warmerdam	John					✓
Technical reviewer (applicant)	Yang	Weidong					✓

Duration of verification

Preparations: From 19-March-2012 to 20-March-2012
On-site verification: From 21-March-2012 to 22-March-2012
Desk review, reporting, calculation checks and QA/QC: From 09-April-2012 to 21-June-2012

3.2 Site inspections & interviews

DNV completed an onsite assessment of the project facility locations at Eaton Rapids, MI and Strathroy, ON, on 21-22 March, 2012. Meridian is responsible for all monitoring, measurement and reporting activities relating to the project. They maintain a collection system incorporating appropriate equipment calibration, training of site employees and submission of monitoring reports to CCC. On 21 March, 2012 DNV staff met with Mr. Brian Jones of MJ Bradley and Mr. Chuck Woodburn of Meridian, and on site staff at the Eaton Rapids, MI facility. Inspections at the Eaton Rapids facility included an overview of the magnesium parts manufacturing process and review of the cover gas feed systems from the gas supply to each injection machine. It also included a review of the SO₂ back up cover gas system. SO₂ gas is used for emergencies such as power outages, and for the ingot manufacture process.

On 22 March, Mr. Woodburn, Mr. Jones and DNV staff visited the Strathroy, ON facility and met with the onsite staff. The Strathroy facility inspection included an overview of the magnesium parts manufacturing

process, the cover gas feed systems from the gas supply to each injection machine, the Novec-612™ feed system and the SO₂ cover gas feed system. It also included the required safety monitoring equipment for the process.

A list of supporting documentation was developed onsite and provided by the onsite staff by the end of the meetings at the facility.

During the site visits, interviews were held with Mr. Brian Jones, Mr. Chuck Woodburn of Meridian and on site staff. Questions asked were specific to the GHG management, tracking, calibration, calculation and reporting required for the project. All staff interviewed were found to be competent to perform their assigned tasks.

Prior to the site visits, DNV staff had developed a sampling plan and verification plan, which identified key reporting risks, and used this assessment to determine to what extent the project operator's control systems were adequate for mitigating these risks. The facility engineer from Meridian, Mr. Woodburn, is responsible for all data collection, and compiling of gas consumption numbers, including gas invoices, floor sheets, and compilation of readings from the flow controllers. Data collection also involves entering data into the Excel spreadsheet, making monthly and annual reports and archiving the data. Calibrations of the gas flow meters are all conducted by Polycontrols Inc. at both facilities. Calibrations of the weigh scales are conducted by McLean Scale Company Limited for the Strathroy, ON facility and by Sterling Scale Company Inc. for the Eaton Rapids, MI facility. Mr. Woodburn is also responsible for ensuring that calibration is carried out periodically, at least once per year which is the minimum requirement for the methodology. The data are then supplied to the project consultant for developing the monitoring report.

3.3 Resolution of any material discrepancy

A corrective action request (CAR) is issued, where:

- i. Non-conformities with the monitoring plan or methodology are found in monitoring and reporting, or if the evidence provided to prove conformity is insufficient;
- ii. Mistakes have been made in applying assumptions, data or calculations of emission reductions which will impair the estimate of emission reductions;
- iii. Issues identified in a FAR during validation to be verified during verification have not been resolved by the project participants.

A clarification request (CL) shall be raised if information is insufficient or not clear enough to determine whether the applicable VCS requirements have been met.

A forward action request (FAR) is issued for actions if the monitoring and reporting require attention and/or adjustment for the next monitoring period.

3.3.1 Summary of the CARs, CLs and FARs identified

Three CARs were identified where the details mentioned in the monitoring report did not adequately address the requirements in the methodology, including the amount of magnesium sales at each facility, the data parameters for weighing the magnesium and gases used, and the frequency of the calibrations taking place.

Six CLs were identified requiring further explanation regarding the data recording methods, the flowmeter calibrations, an SF₆ usage spike, and the purpose of the floor sheets with data being crossed out.

One FAR remained outstanding from the third verification report relating to a leak occurrence in the SF₆ delivery system. The FAR was explained in the monitoring report dated March 12, 2012 and cleared by DNV.

A full list of the CARs, CLs and FAR with responses are provided in **Appendix A**.

4 VERIFICATION FINDINGS

4.1 Project implementation status

As part of the site visit DNV was able to confirm that the project implementation is in accordance with the project description contained in the registered VCS PD of 9 Mar 2009, and that the monitoring has been carried out in accordance with the monitoring plan contained in the registered VCS PD.

The third verification report dated 19 May, 2011 contained one forward action request (FAR) as an outstanding issue to be addressed. FAR 4 required further details ensuring that the mass and CO₂e of SF₆ released during a leak event is properly accounted for in the 2011 monitoring report. Specifically, whatever mass is determined to have been released during this event cannot have the 0.5 destruction factor applied when calculating project emissions, as it was not used as cover gas and will not have been degraded by that process.

FAR 4 was addressed in the 2011 Monitoring Plan, as follows:

Meridian shuts down for the Christmas holiday every year around 22 December and operations did not start up until after the Christmas shut down on 1 January, 2011. According to the SF₆ log

sheet from 2011, the SF₆ bottles installed on 10 December, 2010 were not in use until 3 January, 2011. When operations started up on 3 January, 2011, a SF₆ leak was detected in the system that drained three bottles in three days. There was also 5 lbs of SF₆ left in one bottle that was installed in November 2010. Therefore, the bottles from 10 December, 2010 (total weight 327 lbs) and the 5 lbs from the bottle carried over from November are accounted for in project emissions for 2011 without the application of the 0.5 destruction factor for these project emissions.

It is DNV's conclusion that the FAR 4 is considered to be adequately addressed, and is closed.

There is a deviation reported from the validated methodology identified in the project, relating to the monitoring methodology of some of the main parameters. The methodology of measuring the consumption of alternate gas in the project scenario has been changed from the original PDD, from measuring by the flow meters, to measuring by weight of the gas consumed. This change has been implemented since the start of the project, and since the start of the current crediting period. Both methods are acceptable methods as detailed in the methodology AM0065 for each of the cover gases used.

The Project Proponent has made revisions to the Monitoring Report, detailing the changes in the section 2.2 of the Monitoring Report. There has been no change to the baseline calculations, or the amount of emissions reductions due to the change in the measuring technique for the parameters measured.

DNV has determined that in fact the Project Proponent has used the weight difference method from the start of the project, and the flow meters were used to regulate the flow of the gas. This difference was overlooked at the time of the verification. DNV confirms that this difference has no impact on the measurement accuracy and has no impact on the previously verified emission reductions. All weighing equipment used is properly calibrated according to industry standard and the methodology AM0065, and the deviation is acceptable.

The parameters are monitored rigorously by staff at the Meridian facilities, and therefore the measurement instruments are operated and meticulously maintained by the facility. Table 2 below provides a description of the measured parameters as detailed in the monitoring report and the methodology AM0065 V02.1.

Table 2 – Assessment of measured parameters

	Assessment/ Observation
Data / Parameter: (as in monitoring plan):	P _{Mg,PJ,k,j,y} (Mg Metal Produced/Melted)

Monitoring frequency:	Per batch
Reporting frequency:	Per batch
Is measuring and reporting frequency in accordance with the monitoring plan and monitoring methodology? (Yes / No)	Yes
Type of monitoring equipment:	Sterling weight scale (US) and Pennsylvania Weight Scale (Canada)
Is accuracy of the monitoring equipment equal or more accurate as stated in monitoring plan? If the monitoring plan does not specify the accuracy of the monitoring equipment, does the monitoring equipment represent good monitoring practice?	Yes
Calibration frequency /interval:	Bi-annually (US) (Calibration certificate # 11-7479 dated 31 January 2011 and Certificate # 11-8021 dated 20 July 2011) /6/ and annually (Canada) (Calibration certificates for High Street and Wright Street locations, dated May 18, 2011 /7/.
Is the calibration interval in line with the monitoring plan? If the monitoring plan does not specify the frequency of calibration, does the selected frequency represent good monitoring practice?	Yes (minimum requirement is annual calibration)
Company performing the calibration:	Sterling Scale Company Inc. (US) & McLean Scale Company Limited (Canada) perform the calibrations of the weight scales. Polycontrols are hired by Meridian to complete all gas flow meter calibrations for all facilities in US and Canada
Did calibration confirm proper functioning of monitoring equipment? (Yes / No):	Yes, calibration certificates mark notes of any disfunction and re-testing
Is (are) calibration(s) valid for the whole reporting period? If the calibration does not cover the whole period please indicated how the project has revised its GHG calculations for the period that calibration was not valid.	Yes the Methodology requires calibration at least once per year. Calibrations were completed bi-annually (US) (Calibration certificate # 11-7479 dated 31 January 2011 and Certificate # 11-8021 dated 20 July 2011) /6/ and annually (Canada) (Calibration certificates for High Street and Wright

	Street locations, dated May 18, 2011 /7/.
If applicable, has the reported data been cross-checked with other available data?	Yes, reported data was cross checked with gas tracking floor sheets /10/, /11/, invoices /8/, /9/ and magnesium metal report /5/.
How were the values in the monitoring report verified?	Documents reviewed included magnesium metal report, /5/ and data reporting of amounts of Mg used /3/, /4/.
Does the data management (from monitoring equipment to emission reduction calculation) ensure correct transfer of data and reporting of emission reductions and are necessary QA/QC processes in place?	Yes, data was checked from the gas floor tracking sheets /8/, /9/ invoices /10/, /11/, and the data reports /3/, /4/.
In case only partial data are available because activity levels or non-activity parameters have not been monitored in accordance with the registered monitoring plan, has the most conservative assumption theoretically possible been applied or has a request for deviation been approved?	Complete data is available.

	Assessment/ Observation
Data / Parameter: (as in monitoring plan):	C _{ALTGAS,P,J,k,j,y} (Novec-612™)
Measuring frequency:	Once cylinder is replaced
Reporting frequency:	Per cylinder used
Is measuring and reporting frequency in accordance with the monitoring plan and monitoring methodology? (Yes / No)	Yes measurement of the difference in cylinder weight for Novec-612™ used (weight difference method). (Flow meters are used to regulate flow only)
Type of monitoring equipment:	Sterling weight scale (US) and Pennsylvania Weight Scale (Canada) (Novec high flow mass flow meter Mass Flow Meter Brooks 5850S & 5853S (US and Canada) used to regulate flow)
Is accuracy of the monitoring equipment equal or more accurate as stated in monitoring plan?	Yes the monitoring equipment represents good practice

If the monitoring plan does not specify the accuracy of the monitoring equipment, does the monitoring equipment represent good monitoring practice?	
Calibration frequency /interval:	Bi-annually (US) (Calibration certificate # 11-7479 dated 31 January 2011 and Certificate # 11-8021 dated 20 July 2011) /6/ and annually (Canada) (Calibration certificates for High Street and Wright Street locations, dated May 18, 2011 /7/.
Is the calibration interval in line with the monitoring plan? If the monitoring plan does not specify the frequency of calibration, does the selected frequency represent good monitoring practice?	Yes (minimum requirement is annual calibration)
Company performing the calibration:	Sterling Scale Company Inc. (US) & McLean Scale Company Limited (Canada) perform the calibrations of the weight scales. Polycontrols are hired by Meridian to complete all gas flow meter calibrations for all facilities in US and Canada
Did calibration confirm proper functioning of monitoring equipment? (Yes / No):	Yes, calibration certificates mark notes of any disfunction and re-testing
Is (are) calibration(s) valid for the whole reporting period? If the calibration does not cover the whole period please indicated how the project has revised its GHG calculations for the period that calibration was not valid.	Yes the Methodology requires calibration at least once per year. Calibrations were completed bi-annually (US) (Calibration certificate # 11-7479 dated 31 January 2011 and Certificate # 11-8021 dated 20 July 2011) /6/ and annually (Canada) (Calibration certificates for High Street and Wright Street locations, dated May 18, 2011 /7/.
If applicable, has the reported data been cross-checked with other available data?	Yes, reported data was cross checked with gas tracking floor sheets /10/, /11/, invoices /8/, /9/ and magnesium metal report /5/.
How were the values in the monitoring report verified?	Documents reviewed included calibration certificates /6/, /7/, and invoices for Novec-612 TM /10/, /11/ and floor tracking data /8/, /9/.
Does the data management (from monitoring equipment to emission reduction calculation)	Yes, data was checked from the gas floor tracking sheets /8/, /9/ purchase receipts /10/, /11/, and the

ensure correct transfer of data and reporting of emission reductions and are necessary QA/QC processes in place?	data reports /3/, /4/.
In case only partial data are available because activity levels or non-activity parameters have not been monitored in accordance with the registered monitoring plan, has the most conservative assumption theoretically possible been applied or has a request for deviation been approved?	Complete data is available. Data is recorded separately for each segment (ie die cast and Mg recycling) and per each facility.

	Assessment/ Observation
Data / Parameter: (as in monitoring plan):	C _{SF6,CON,PJ,k,j,y} (SF ₆ consumed)
Measuring frequency:	Once cylinder is replaced
Reporting frequency:	Per cylinder used
Is measuring and reporting frequency in accordance with the monitoring plan and monitoring methodology? (Yes / No)	Yes measurement of the difference in cylinder weight used (weight difference method). (Flow meters are used to regulate flow only)
Type of monitoring equipment:	Sterling weight scale (US) and Pennsylvania Weight Scale (Canada) (Mass Flow Meter Brooks 5850S & 5853S (US and Canada) used to regulate flow)
Is accuracy of the monitoring equipment equal or more accurate as stated in monitoring plan? If the monitoring plan does not specify the accuracy of the monitoring equipment, does the monitoring equipment represent good monitoring practice?	Yes the monitoring equipment represents good monitoring practices.
Calibration frequency /interval:	Bi-annually (US) (Calibration certificate # 11-7479 dated 31 January 2011 and Certificate # 11-8021 dated 20 July 2011) /6/ and annually (Canada) (Calibration certificates for High Street and Wright Street locations, dated May 18, 2011 /7/.
Is the calibration interval in line with the	Yes (minimum requirement is annual calibration)

monitoring plan? If the monitoring plan does not specify the frequency of calibration, does the selected frequency represent good monitoring practice?	
Company performing the calibration:	Sterling Scale Company Inc. (US) & McLean Scale Company Limited (Canada) perform the calibrations of the weight scales. Polycontrols are hired by Meridian to complete all gas flow meter calibrations for all facilities in US and Canada
Did calibration confirm proper functioning of monitoring equipment? (Yes / No):	Yes, calibration certificates mark notes of any disfunction and re-testing
Is (are) calibration(s) valid for the whole reporting period? If the calibration does not cover the whole period please indicated how the project has revised its GHG calculations for the period that calibration was not valid.	Yes the Methodology requires calibration at least once per year. Calibrations were completed bi-annually (US) (Calibration certificate # 11-7479 dated 31 January 2011 and Certificate # 11-8021 dated 20 July 2011) /6/ and annually (Canada) (Calibration certificates for High Street and Wright Street locations, dated May 18, 2011 /7/.
If applicable, has the reported data been cross-checked with other available data?	Yes, reported data was cross checked with gas tracking floor sheets /10/, /11/, invoices /8/, /9/ and magnesium metal report /5/.
How were the values in the monitoring report verified?	Documents reviewed included invoices for SF ₆ and floor tracking data
Does the data management (from monitoring equipment to emission reduction calculation) ensure correct transfer of data and reporting of emission reductions and are necessary QA/QC processes in place?	Yes, data was checked from the gas floor tracking sheets /8/, /9/ purchase receipts /10/, /11/, and the data reports /3/, /4/.
In case only partial data are available because activity levels or non-activity parameters have not been monitored in accordance with the registered monitoring plan, has the most conservative assumption theoretically possible been applied or has a request for deviation been approved?	Complete data is available.

	Assessment/ Observation
Data / Parameter: (as in monitoring plan):	SO ₂ emissions
Measuring frequency:	Daily
Reporting frequency:	Monthly
Is measuring and reporting frequency in accordance with the monitoring plan and monitoring methodology? (Yes / No)	Yes measurement of the difference in cylinder weight used (weight difference method). (Flow meters are used to regulate flow only)
Type of monitoring equipment:	Sterling weight scale (US) and Pennsylvania Weight Scale (Canada) (Mass Flow Meter Brooks 5850S & 5853S (US and Canada) used to regulate flow)
Is accuracy of the monitoring equipment equal or more accurate as stated in monitoring plan? If the monitoring plan does not specify the accuracy of the monitoring equipment, does the monitoring equipment represent good monitoring practice?	Yes the monitoring equipment represents good monitoring practices.
Calibration frequency /interval:	Bi-annually (US) (Calibration certificate # 11-7479 dated 31 January 2011 and Certificate # 11-8021 dated 20 July 2011) /6/ and annually (Canada) (Calibration certificates for High Street and Wright Street locations, dated May 18, 2011 /7/.
Is the calibration interval in line with the monitoring plan? If the monitoring plan does not specify the frequency of calibration, does the selected frequency represent good monitoring practice?	Yes (minimum requirement is annual calibration)
Company performing the calibration:	Sterling Scale Company Inc. (US) & McLean Scale Company Limited (Canada) perform the calibrations of the weight scales. Polycontrols are hired by Meridian to complete all gas flow meter calibrations for all facilities in US and Canada
Did calibration confirm proper functioning of monitoring equipment? (Yes / No):	Yes, calibration certificates mark notes of any disfunction and re-testing

Is (are) calibration(s) valid for the whole reporting period? If the calibration does not cover the whole period please indicated how the project has revised its GHG calculations for the period that calibration was not valid.	Yes the Methodology requires calibration at least once per year. Calibrations were completed bi-annually (US) (Calibration certificate # 11-7479 dated 31 January 2011 and Certificate # 11-8021 dated 20 July 2011) /6/ and annually (Canada) (Calibration certificates for High Street and Wright Street locations, dated May 18, 2011 /7/.
If applicable, has the reported data been cross-checked with other available data?	Yes, reported data was cross checked with gas tracking floor sheets /10/, /11/, invoices /8/, /9/ and magnesium metal report /5/.
How were the values in the monitoring report verified?	Documents reviewed included invoices for SO ₂ /10/, /11/ and floor tracking data /8/, /9/
Does the data management (from monitoring equipment to emission reduction calculation) ensure correct transfer of data and reporting of emission reductions and are necessary QA/QC processes in place?	Yes, data was checked from the gas floor tracking sheets /8/, /9/ purchase receipts /10/, /11/, and the data reports /3/, /4/.
In case only partial data are available because activity levels or non-activity parameters have not been monitored in accordance with the registered monitoring plan, has the most conservative assumption theoretically possible been applied or has a request for deviation been approved?	Complete data is available.

	Assessment/ Observation
Data / Parameter: (as in monitoring plan):	Magnesium sales (Magnesium melted)
Measuring frequency:	Per batch
Reporting frequency:	Per batch
Is measuring and reporting frequency in accordance with the monitoring plan and monitoring methodology? (Yes / No)	Yes (minimum requirement is annual calibration)
Type of monitoring equipment:	Sterling weight scale (US) and Pennsylvania Weight

	Scale (Canada)
Is accuracy of the monitoring equipment equal or more accurate as stated in monitoring plan? If the monitoring plan does not specify the accuracy of the monitoring equipment, does the monitoring equipment represent good monitoring practice?	Yes the monitoring equipment represents good monitoring practices.
Calibration frequency /interval:	Bi-annually (US) (Calibration certificate # 11-7479 dated 31 January 2011 and Certificate # 11-8021 dated 20 July 2011) /6/ and annually (Canada) (Calibration certificates for High Street and Wright Street locations, dated May 18, 2011 /7/.
Is the calibration interval in line with the monitoring plan? If the monitoring plan does not specify the frequency of calibration, does the selected frequency represent good monitoring practice?	Yes (minimum requirement is annual calibration)
Company performing the calibration:	Sterling Scale Company Inc. (US) & McLean Scale Company Limited (Canada)
Did calibration confirm proper functioning of monitoring equipment? (Yes / No):	Yes, calibration certificates mark notes of any disfunction and re-testing
Is (are) calibration(s) valid for the whole reporting period? If the calibration does not cover the whole period please indicated how the project has revised its GHG calculations for the period that calibration was not valid.	Yes the Methodology requires calibration at least once per year. Calibrations were completed bi-annually (US) (Calibration certificate # 11-7479 dated 31 January 2011 and Certificate # 11-8021 dated 20 July 2011) /6/ and annually (Canada) (Calibration certificates for High Street and Wright Street locations, dated May 18, 2011 /7/.
If applicable, has the reported data been cross-checked with other available data?	Yes, reported data was cross checked with gas tracking floor sheets /10/, /11/, invoices /8/, /9/ and magnesium metal report /5/.
How were the values in the monitoring report verified?	Documents reviewed included invoices for Mg, and data reporting of amounts of Mg used.
Does the data management (from monitoring equipment to emission reduction calculation) ensure correct transfer of data and reporting of	Yes, data was checked from the magnesium metal reports, /5/, and the data reports /3/, /4/.

emission reductions and are necessary QA/QC processes in place?	
In case only partial data are available because activity levels or non-activity parameters have not been monitored in accordance with the registered monitoring plan, has the most conservative assumption theoretically possible been applied or has a request for deviation been approved?	Complete data is available.

4.2 Accuracy of GHG emission reduction or removal calculations

Meridian Magnesium Products was involved in the design and installation of the project and also maintains the control and monitoring system. The project applies the approved Clean Development Mechanism (CDM) methodology AM0065, Version 2.1 "Replacement of SF₆ with Alternate Cover Gas in the Magnesium Industry." The approved default values determined during the validation phase have been used to estimate the emission reductions from the implementation of this project activity.

In the 2010 project year, the project participant revised the SF₆ GWP from 22 800 to 23 900. SF₆ GWP of 23 900 is consistent with the methodology contained in AM0065. DNV accepted this revision as it is consistent with the CDM methodology and CDM Executive Board (EB) Validation and Verification Manual /13/, /22/.

The *ex-post* estimation of the emission reductions for the monitoring period is determined using the equation:

$$\text{Baseline Emissions} = \text{Magnesium produced (die casting/ recycling)} * \text{Baseline emissions factors}$$

The baseline emission factors for each segment (tSF₆/tMg) were calculated from an analysis of three years of historical data (2005, 2006 and 2007 for the facility at Eaton Rapids, MI and 2004, 2005 and 2006 for the facility at Strathroy, ON), according to the requirements of AM0065 /14/.

Baseline emissions factors calculated according to AM0065 /14/, found in the Monitoring Report /1/, /2/ are:

	Die Casting	Recycling
U.S. facility (EFSF ₆ Mg)	0.0000914	0.000385
Canadian facility (EFSF ₆ Mg)	0.0000549	0.000684

Project Emissions = Emissions from use of Novec-612™ +
Emissions from use of SF₆

Emissions from use of Novec-612™ = Amount of Novec-612™ used * Novec-612™ GWP*CF
(Equation 10 of AM0065, /14/).

Emissions from use of SF₆ = Amount of SF₆ emitted * SF₆ GWP

	GWP
Novec-612™	2 830
SF ₆	23 900

Emission Reduction = Baseline Emissions – Project Emissions

4.3 Quality of evidence to determine GHG emission reductions or removals

All necessary documentation was collected, referenced and aggregated and was accessible in either hard-copy or electronic format. The following data and documents were verified either during the desk review or the site visit, to confirm the emission reduction calculations for the period of 1 January, 2011 to 31 December, 2011 are in compliance with the methodology and the Monitoring Report.

The monitoring methodology as described in AM0065 Version 2.1 “Replacement of SF₆ with Alternate Cover Gas in the Magnesium Industry” is correctly applied. Project emissions of CH₄, C₂F₆ and C₃F₈ that result from the interaction between Novec-612™ and molten magnesium are not monitored in this application. Instead, the project proponent is incorporating the conservative factor (CF) described in Equation 10 of AM0065 to account for these emissions /14/. The data monitored during the period of 1 January, 2011 to 31 December, 2011 are shown below in Table 3.

Table 3: List of parameters and documentation

Parameter	Documentation Verified
Amount of magnesium produced	Weight entered in report monthly /3/, /4/, /5/
Amount of Novec-612™ used	Monthly update on Excel sheet by Facility Engineer when the empty bottle is replaced /3/, /4/, /10/, /11/
Amount of SO ₂ used	Monthly update on Excel sheet by Facility Engineer when the empty bottle is replaced /3/, /4/, /10/, /11/
Amount of SF ₆ used	Update of SF ₆ usage record when the empty bottle is replaced /5/, /10/, /11/

The use of SO₂ as a cover gas requires special monitoring and safety precautions in order to conform to both local safety regulations and methodology AM0065. DNV has been able to verify that these requirements have been met. Table 4 below provides the list of requirements and how they have been verified.

Table 4: List of Requirements and Method of Verification

Requirement	Method of Verification
Well-controlled SO ₂ concentration and flow rates with concentration typically 1% or less.	SO ₂ concentration charts were verified to confirm that the SO ₂ concentration was below 1% /10/
An associated SO ₂ exhausting and abatement system to ensure SO ₂ emissions are in compliance with the local environmental regulations. Emissions from the facility to the ambient air should comply with the standards of each country or local agency.	The Meridian facility in Michigan emits a very small amount of SO ₂ and is not regulated.
If no local standards exist, the following value should be taken into account as a emission limit for SO ₂ concentration in the exhaust system: 1470 mg/m ³ (dry basis, 273 K, 101,325 kPa at an oxygen concentration of 6 %(v/v)).	The SO ₂ concentration in the exhaust system was verified by the Strathroy emissions report.

Requirement	Method of Verification
Precise gas mixing and delivery system using mass flow controllers (MFCs) or similarly accurate device and heated gas lines to SO ₂ .	Verified by visual inspection during visit to U.S. and Canadian facilities.
Gas cabinet or cylinder storage area with leak monitors and emergency ventilation system.	Verified by visual inspection that Gas Cabinet with leak monitors present at both facilities.
Redundant / back-up melt protection technology in case SO ₂ leak requires system shut-down and repair.	SF ₆ system is in place and can be used in the event of emergency. Both facilities also have a premixed bank of gas ready for use. Monitors shut the system down if they detect a concentration of 1 PPM SO ₂ , then auto switch to SF ₆ system.
Back-up power / generator for gas mixing system and necessary controls, compressors, etc.	12-kW backup generator is in place and has an auto start function in the event of a power outage.

The monitoring of the project is complete and in accordance with the approved monitoring methodology. The monitoring methodology and supporting records are sufficient to enable verification of emission reductions. The clarifications raised during the verification process have been addressed in order to ensure that the project monitoring is complete and accurate.

The baseline emissions factors were calculated from an analysis of three years of historical data (2005, 2006 and 2007 for the facility at Eaton Rapids, MI and 2004, 2005 and 2006 for the facility at Strathroy, ON), according to the requirements of AM0065 /14/.

4.4 Management and operational system

Meridian is responsible for monitoring, measurement and reporting activities. They maintain a collection system with proper equipment calibration and training of site employees, and submit monitoring reports to CCC. Details on the data collection process are provided above in section 3.2.

The procedure for the monitoring system, internal audit and management review has been established and followed by Mr. Woodburn.

5 VERIFICATION CONCLUSION

Det Norske Veritas (U.S.A.) Inc. (DNV) has performed the verification of the emission reductions that have been reported for the “Conversion of SF6 to an Alternate Cover Gas in Magnesium Production in Eaton Rapids, MI and Strathroy, ON Project” (VCS Registration No. 618) for the period 01-January-2011 to 31-December-2011.

The project participants are responsible for the collection of data in accordance with the monitoring plan and the reporting of GHG emissions reductions from the project.

It is DNV's responsibility to express an independent verification statement on the reported GHG emission reductions from the project.

DNV conducted the verification on the basis of the approved methodology No AM0065 (version 02.1), the monitoring plan contained in the Registered VCS PD of 9 Mar 2009 and the monitoring report (version 01) dated 21-June-2012. The verification included i) checking whether the provisions of the monitoring methodology and the monitoring plan were consistently and appropriately applied and ii) the collection of evidence supporting the reported data.

DNV's verification approach draws on an understanding of the risks associated with reporting of GHG emission data and the controls in place to mitigate these risks. DNV planned and performed the verification by obtaining evidence and other information and explanations that DNV considers necessary to give reasonable assurance that reported GHG emission reductions are fairly stated.

In our opinion the GHG emissions reductions of the “Conversion of SF6 to an Alternate Cover Gas in Magnesium Production in Eaton Rapids, MI and Strathroy, ON Project” (VCS Project ID No. 618) for the period 01-January-2011 to 31-December-2011 are fairly stated in the monitoring report (version 01) dated 21-June-2012.

The GHG emission reductions were calculated correctly on the basis of the approved methodology No AM0065 (version 02.1) and the monitoring plan contained in the Registered VCS PD of 9 Mar 2012.

Det Norske Veritas (U.S.A.) Inc. is able to certify that the emission reductions from the “Conversion of SF6 to an Alternate Cover Gas in Magnesium Production in Eaton Rapids, MI and Strathroy, ON Project” during the period 01-January-2011 to 31-December-2011 amount to 186,584 tonnes CO2 equivalent (Michigan, U.S.) and 20,958 tonnes CO2 equivalent (Ontario, Canada) as detailed as below.

Reporting period: 01-January-2011 to 31-December-2011

Verified GHG emission reductions or removals in the above reporting period:

GHG Emission Reductions or Removals	tCO ₂ e Michigan, U.S.	tCO ₂ e Ontario, Canada
Baseline Emissions	237 808	34 081
Project Emissions	51 224	13 123
Leakage	0	0
Net GHG emission reductions or removals	186 584	20 958

DNV does not assume any responsibility towards the issuance and utilization of the VCUs hereby verified and certified. Request for issuance of VCUs shall be made by the project proponent to an approved VCS Program Registry based on the requirements set out under the most recent version of the VCS Program Guidelines clause on VCS Registration.

The verification of reported emission reductions is based on the information made available to DNV and the engagement conditions detailed in this report. DNV cannot be held liable by any party for decisions made or not made based on this report.

6 REFERENCES

Documents provided by the Project Participants that relate directly to the GHG components of the project. These have been used as direct sources of evidence for the periodic verification conclusions, and were further checked through interviews with key personnel.

- /1/ Climate Change Capital, Monitoring Report of Conversion of SF₆ to an Alternative Cover Gas in Magnesium Production in Eaton Rapids, MI and Strathroy, ON, Rev. 0, 11 May, 2012.
- /2/ Climate Change Capital, Monitoring Report of Conversion of SF₆ to an Alternative Cover Gas in Magnesium Production in Eaton Rapids, MI and Strathroy, ON, version 1, 21 June 2012.
- /3/ Climate Change Capital, Meridian Magnesium emission reduction monitoring data, revised 11 May 2012 (Meridian 2011 Monitoring Data_REVISED_MJBA.xlsx)
- /4/ Climate Change Capital, Meridian Magnesium emission reduction monitoring data, 11 April 2012 (Meridian 2011 Monitoring Data.xlsx)
- /5/ Climate Change Capital, Meridian Magnesium Metal report, 11 April 2012 (MLTI Metal Report 2011.xls)
- /6/ Calibration records for Eaton Rapids MI (Sterling Metal Scale Cert_0550_001 MPA 2011.pdf, R15908 9-1-10.pdf, R15909 8-31-10.pdf, R15910 8-31-10.pdf, R16590 8-31-10.pdf, R16591 8-25-10.pdf, R16592 8-25-10.pdf, R16593 8-30-10.pdf, R16594 8-30-10.pdf, R16595 8-30-10.pdf)
- /7/ Calibration records for Strathroy ON (High St Plant May 2011.pdf, Wright St Plant E May 2011.pdf, 2855_001.pdf, 2856_001.pdf, 2860_001.pdf, 2861_001.pdf, 2865_001.pdf, 2866_001.pdf, 2868_001.pdf, 2869_001.pdf, 3609_001.pdf)
- /8/ Gas Floor Tracking Sheets for Eaton Rapids, MI (Novec Tracking floor sheet MPA 2011.pdf, SF6 Aga gas invoices MPA 2011.pdf)
- /9/ Gas Floor Tracking Sheets for Strathroy ON (Cover Gas Tracking Floor Sheets MLTI 2011.pdf)
- /10/ Gas use invoices for Novec, SF₆ at Eaton Rapids, MI (Novec invoices MPA 2011.pdf, SF6 Aga gas invoices MPA 2011.pdf)
- /11/ Gas use Invoices for Novec, SF₆ at Strathroy ON (Novec Invoices MLTI 2011.pdf, SF6 invoices MLTI 2011.pdf, 3609_001_Invoices.pdf)
- /12/ Climate Change Capital, Calibration equipment records (MPA_MLTI Poly mass flow matrix.xls)

Background documents related to the design and/or methodologies employed in the design or other reference documents.

- /13/ CDM Executive Board: *Validation and Verification Manual*. Version 01.2
- /14/ Approved Baseline and Monitoring Methodology AM0065: "Replacement of SF₆ with alternate cover gas in the magnesium industry." Version 02.1.
- /15/ Verified Carbon Standard Association, VCS Standard 2007.1, V 3.2, 1 February, 2012
- /16/ Verified Carbon Standard Association, VCS Program Guide, Version 3.2, 1 February 2012
- /17/ VCS Project Description of Conversion of SF₆ to an Alternative Cover Gas in Magnesium Production in Eaton Rapids, MI and Strathroy, ON, v.2, 9 March 2009
- /18/ DNV, VCS 2007.1 Validation Report for "Conversion of SF₆ to an Alternative Cover Gas in Magnesium Production in Eaton Rapids, MI and Strathroy, ON" project, 1 April 2009, USA

- /19/ DNV, VCS 2007.1 Verification Report for "Conversion of SF₆ to an Alternative Cover Gas in Magnesium Production in Eaton Rapids, MI and Strathroy, ON" project, 6 April 2009, USA
- /20/ DNV, VCS 2007.1 Verification Report for "Conversion of SF₆ to an Alternative Cover Gas in Magnesium Production in Eaton Rapids, MI and Strathroy, ON" project, 23 August, 2010, USA
- /21/ DNV, VCS 2007.1 Verification Report for "Conversion of SF₆ to an Alternative Cover Gas in Magnesium Production in Eaton Rapids, MI and Strathroy, ON" project, 19 May, 2011, USA
- /22/ Climate Change 1995, The Science of Climate Change: Summary for Policymakers and Technical Summary of the Working Group I Report, page 22. www.unfccc.int/ghg_data/items/3825.php.

APPENDIX A

CORRECTIVE ACTION REQUESTS, CLARIFICATION REQUESTS AND FORWARD ACTION REQUESTS

Corrective action requests

CAR ID	Corrective action request	Response by Project Participants	DNV's assessment of response by Project Participants
--------	---------------------------	----------------------------------	--

CAR ID	Corrective action request	Response by Project Participants	DNV's assessment of response by Project Participants
CAR 1 Appendix A	The methodology specifies a monitoring parameter for magnesium sales, to be measured by Mg sales reports (proof of sales). This is not mentioned in the monitoring report. Please provide explanation and receipts of magnesium sales or other.	Because of the nature of the magnesium metal melting and part manufacturing process, Meridian has considered the term "magnesium manufactured" as magnesium melted and Meridian accounts of this by the ingots delivered to each die cast cell. In the die casting operations, typically 45%-50% of the metal melted or manufactured is sent away as scrap. This consists of the runners, biscuit, flash and over flows plus a couple of other by products. One must also factor in the scrap, which would be 100% of the metal melted to make a scrap part. Scrap usually averages about 10% but can be as high as 30% or as low as 1% depending on the part made. In addition to metal melted, Meridian tracks the magnesium sales as parts. For the Eaton Rapids, MI plant MPA (U.S.) attached is the file (Eaton Rapids Parts Sold). Cell AE104 shows MPA sold 31,986,738 lbs of parts in 2011. In recycling the "KPI Remelt" file provided provides several columns of data. There is a column for magnesium melted or manufactured. This is the total metal melted. It is comprised of several items. Ingots produced, Ingots re-melted, Dross and additives. Ingots Produced would be the same as parts sold. For the Strathroy, ON plant attached is the file (MLTI 2011 Metal Report) that shows the parts sold by month and YTD. Cell N 481 shows 24,743,308 LBS sold in 2011.	The explanation provided by the project participant included a definition of the term 'magnesium manufactured' or 'magnesium sales' is being the same as 'magnesium melted', 'ingots produced' and 'parts sold'. Taking all of the terminology into consideration, only approximately 1-2% of the melted metal comes out as oily re-melt, and being poor quality is shipped offsite and not used. The rest of the metal is captured as recycled metal. The files provided by the project participants support the explanation. This explanation is accepted and the CAR is closed.

CAR ID	Corrective action request	Response by Project Participants	DNV's assessment of response by Project Participants
CAR 2	The monitoring method for each of the data parameters is not detailed in the monitoring report. For example, the methodology states that Mg should be weighed by calibrated scales, at least calibrated annually, and the Monitoring Report to specify if weight is continuous or by batch. For the gases Novec 612, SF₆ and SO₂ there are 3 methods that can be used for monitoring; the accounting method, weight difference method or flow method. If using flow measurement method, flow metres should be calibrated annually. This is not addressed in the Monitoring report. Please explain the monitoring method for each parameter.	Each data parameter is weighed with weigh scales. The mass flow meters have very little to do with the quantification of the cover gas used. Mg is weighed by calibrated scales on a batch basis. For the Eaton Rapids, MI facility, the Sterling scale (serial number 24098) is used to weigh the Mg and is calibrated every six months. The calibrations for this scale were conducted on January 31, 2011 and July 20, 2011 as indicated in the document provided "Sterling Metal Scale Cert_0550_001 MPA 2011.pdf" For the Strathroy, ON facility, the Pennsylvania 7600 scale (# 00269455) is used to weigh the Mg and is calibrated yearly. The calibration for this scale was conduct on May 18, 2011, as indicated in the document provided "Wright St Plant E May 2011.pdf" Cover gas usage is determined through mass balance accounting methods. For the gases, the weight of the Novec tote is tracked using the same weigh scales as the metal at the facilities. The tote is weighed every time the Novec system is filled. For the Canadian plant, there are two different Pennsylvania scales – one for Wright Street (# 00269455) and one for High Street (#97242573). The SF₆ cylinders and SO₂ cylinders are also weighed upon cylinder change out using weigh scales. At the Eaton Rapids plant, the Sterling Scale is used to track the SO₂ and SF₆ gas usage from cylinder weights. At the Strathroy plant, Eagle (EI 2000) weight scales are utilized to track the SO₂ and SF₆ usage from cylinder weights.	The monitoring method for each parameter was explained and supported by calibration and other documents. It is within the specification of the methodology. This CAR is closed.

CAR ID	Corrective action request	Response by Project Participants	DNV's assessment of response by Project Participants
CAR 3	The Monitoring Plan does not specify the frequency of calibration for the measured parameters: Mg, Novec, SF ₆ and SO ₂ . Please provide details of the calibration frequency.	All weigh scales are calibrated at least annually as are the flow meters for the Novec, SF ₆ and SO ₂ .	The explanation of calibration frequency was supported by documentation and is within the specification of the methodology. This CAR is closed

Clarification requests

CAR ID	Corrective action request	Response by Project Participants	DNV's assessment of response by Project Participants
CL 1	In the data sheet provided, "Meridian 2011 Monitoring Data," the figures for the amounts of metal melted for both recycled and die-cast metals using Novec / SF ₆ /SO ₂ are manually entered. Please explain how the figures are derived.	The metal melted by gas is derived using the flow meter settings and gas consumed based on weigh scale measurements.	This CL was to clarify how the data was transferred to the data sheets which indicates a great chance of errors. Data was checked against documentation provided and found to be accurate. This CL is closed.
CL 2	It is not clear which gas the flowmeter is used for from the calibration certificate, or if any of the certificates are for the same gases. This is not itemized on the Monitoring Report. Please provide clarification on the use of each flowmeter.	The mass flow meters are utilized to control the amount (mixture or ratio) of all of the cover gas delivered to each cell. See attached file (Poly Mass Flow Matrix). This provides detail on which unit is in which mixer. The gas type is also on the calibration sheet.	The attached poly flow matrix was applicable for the Eaton Rapids facility. DNV completed a matrix of all calibration information provided. All information was found to be in order, with all calibration certificates provided. This CL is closed.

CAR ID	Corrective action request	Response by Project Participants	DNV's assessment of response by Project Participants
CL 3	There seem to be missing calibration certificates for the flowmeters at the Eaton Rapids facility. All calibration certificates are dated 2010.08 however calibrations should be done at least yearly according to methodology. Please provide calibration certificates completed in 2011 for the flowmeters used at the Eaton Rapids facility.	Meridian must have spare flow meters available at all times in case a replacement is needed. Therefore, several sets of mass flow meters are calibrated and stored in sealed bags until installation. When installed for use, they are within manufacturer specifications. The flow meters in operation in 2011 were calibrated in 2010.	All calibration certificates were provided. This CL is closed.
CL 4	The calibration certificates provided for Strathroy Ontario facility all show different SN for flowmeter equipment between the years 2010 and 2011. Please explain why there are no SN the same, and specify which flowmeters were measuring which gases.	Similar to the Eaton Rapids, MI plant, the Strathroy, ON plant has a complete set of mass flow controllers in stock. This allows Meridian to change them yearly and send the back ups for calibration.	All calibration certificates were provided. This CL is closed.

CAR ID	Corrective action request	Response by Project Participants	DNV's assessment of response by Project Participants
CL 5	The Monitoring Report states that there have been periodic SF6 usage spikes due to the metal quality. Please explain how this is reflected in the data, with examples if possible.	When poor metal is used in the recycling operation, more SF6 is used as a cover gas. For example, Meridian's SF6 use in its Michigan recycling operation was high in January and February of 2011. They received very poor quality scrap metal that had gotten wet and frozen, which creates negative operating conditions which makes it problematic to use the Novec and SO2 alternatives. This stretch of poor metal quality lasted into the second quarter of 2011 requiring higher levels of SF6 use than normal. As the scrap metal quality that entered the plant improved, Meridian was able to rely to a greater degree on the Novec and SO2 alternatives the remainder of the year.	DNV accepts this explanation and this CL is closed.
CL 6	On Document tracking sheets named "Canada Cover Gas Tracking Floor Sheets MLTI 2011" please explain why some of the items are crossed out. Information about the data management systems should be detailed.	When the plant operator tallies the gas usage on the floor sheets he crosses out the data as he conducts the calculation. The data from the floor sheets is entered into the central excel file on a monthly basis.	DNV accepts this explanation and this CL is closed.

Forward action requests from previous verification

FAR ID	Forward action request	Summary of how FAR has been addressed in this reporting period	Assessment of how FAR has been addressed
FAR 4	From DNV's third verification report, dated May 19, 2011, the following FAR was given: During this verification it was noted that a leak occurred in the SF6 delivery system of the Eaton Rapids facility. The project proponent must ensure that the mass and CO2e of SF6 released during this event is properly accounted for in the monitoring report for 2011. Specifically, whatever mass is determined to have been released during this event cannot have the 0.5 destruction factor applied when calculating project emissions, as it was not used as cover gas and will not have been degraded by that process.	Meridian shuts down for the Christmas holiday every year around 22 December and operations did not start up until after the Christmas shut down on 1 January, 2011. According to the SF6 log sheet from 2011, the SF6 bottles installed on 10 December, 2010 were not in use until 3 January, 2011. When operations started up on 3 January, 2011, a SF6 leak was detected in the system that drained three bottles in three days. There was also 5 lbs of SF6 left in one bottle that was installed in November 2011. Therefore, the bottles from 10 December, 2010 (total weight 327 lbs) and the 5 lbs from the bottle carried over from November are accounted for in project emissions for 2011 without the application of the 0.5 destruction factor for these project emissions	The explanation is sound, and the data provided in 2011 reflects the actions described. This FAR is now closed.