



ANNEX 3

ASSESSMENT

REGARDING POST REGISTRATION CHANGES
CELULOSA ARAUCO Y CONSTITUCIÓN S.A.

NUEVA ALDEA BIOMASS POWER PLANT
PHASE 2

UNFCCC REF. No. : 0346

Report No: 8000418961 – 13/065

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	Celulosa Arauco y Constitución S.A		Chile	
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	ACM0006 – " Consolidated methodology for grid-connected electricity generation from biomass residues " ACM0002 - "Consolidated methodology for grid-connected electricity generation from renewable sources".		ACM0006 ver. 2 ACM0002 ver.4	01 / 1.1
Post Registration Changes:	Type of requested changes		Number of changes	Prior Approval required
	<input type="checkbox"/> Temporary deviations from the MP		-	<input type="checkbox"/>
	<input type="checkbox"/> Temporary deviations from the MM		-	<input type="checkbox"/>
	<input checked="" type="checkbox"/> Corrections that do not affect the project		2	<input type="checkbox"/>
	<input type="checkbox"/> Change to the start date of the crediting p.		-	<input type="checkbox"/>
	<input type="checkbox"/> Permanent changes from the MP		-	<input type="checkbox"/>
	<input type="checkbox"/> Permanent changes from the MM		-	<input type="checkbox"/>
	<input checked="" type="checkbox"/> Design changes to the project activity/PoA		2	<input type="checkbox"/>
<input type="checkbox"/> Changes specific to A/R		-	<input type="checkbox"/>	
Revised PDD:	Title:		Attached in TC:	Attached clean:
	Nueva Aldea Biomass Power Plant Phase 2, Version 7		<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
Assessment team / Technical Review and Final Approval	Assessment Team:		Technical review:	Final approval:
	Emilio Martin (TL) Marcelo Sebben (TM) Gilberto Andrade (TE)		Stefan Winter, Martin Saalmann	Martin Saalmann
Assessment Opinion:	<input type="checkbox"/>	The post registration changes require prior Approval by the Board		
	<input checked="" type="checkbox"/>	The post registration changes do not require prior Approval by the Board		
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Abbreviations

CA	Corrective Action / Clarification Action
CAR	Corrective Action Request
CDM	Clean Development Mechanism
CER	Certified Emission Reduction
CL	Clarification Request
CO₂	Carbon dioxide
CO_{2e}	Carbon dioxide equivalent
CP	Certification Program
DNA	Designated National Authority
EB	CDM Executive Board
GHG	Greenhouse gas(es)
PA	Project activity
PDD	Project Design Document
PoA	Programme of Activities
PRC	Post Registration Changes
QC/QA	Quality control/Quality assurance
UNFCCC	United Nations Framework Convention on Climate Change
VVS	Validation and Verification Standard

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1 OBJECTIVE / SCOPE

Celulosa Arauco y Constitución S.A. has commissioned the TÜV NORD JI/CDM Certification Program (CP) to assess post registration changes of the project

Nueva Aldea Biomass Power Plant Phase 2

This report serves for all kind of post registration changes as defined in the PS.

In this case it serves as an annex to the verification report.

2 GENERAL CHARACTERISTICS

2.1 Project Characteristics

As this assessment was carried out as part of the 5th verification of the project activity please refer to chapter 2 of the verification report.

2.2 Overview of Post Registration Changes

Within this report post registration changes as listed in Table 2-2 are assessed.

Table 2-2: Overview Post Registration Changes

#	Applicable as of / from - to	Type of post registration change ¹⁾	Description
1	2011-01-01	CrPDD	The design production capacity of the Pulp Mill was corrected from 856,000 to 1,000,828.8 tons per year of bleached Kraft pulp.
2	2012-04-05	CrPDD	<p>The following corrections are due to change in the CDM PDD template.</p> <ol style="list-style-type: none"> 1- The name of the methodology was corrected as per current Revised Monitoring Plan in section B.1 of the revised PDD. 2- Section B.6.1 of the revised PDD was replaced by sections D.2, D.2.1.4, D.2.3.2 and D.2.4 of the current Revised monitoring plan which was approved on 2012-04-05. 3- Section B.6.2 of the revised PDD: the parameter fixed ex-ante "Average net energy efficiency of electricity generation in (the) other power plant(s) that would use the biomass fired in the project plant in the absence of the project activity ($\epsilon_{el, other\ plant(s)}$)" was included in this section. 4- Section B.7.1 of the revised PDD: It was corrected and replaced by sections D.2.1.1, D.2.1.3 and D.3 of the revised monitoring plan 5- Section B.7.2 of the revised PDD: It was included "Not applicable" 6- Section B.7.3 of the revised PDD: Section D.4 of the current Revised Monitoring plan was included 7- Appendix 5 of the revised PDD: The simplified line diagram of the instrument as per current revised Monitoring Plan was included. 8- In the section B.3 of the revised PDD a table of project boundary as required by the current PDD template (v.4.1) was created.

#	Applicable as of / from - to	Type of post registration change ¹⁾	Description
3	2011-01-01	CoPD	Inclusion of fuel oil to the fossil fuels co-fired in the project plant under the parameter FF _{project plant,i,y}
4	2011-01-01	CoPD	Use of updated data to determine: <ul style="list-style-type: none"> - NCV_i for the ex-ante calculations - the capacity of black liquor to be burned in the recovery boiler - total capacity of the power plant - total power consumption capacity of the pulp mill - total power capacity of surplus of electricity - Electric efficiency of the reference pulp mill (baseline) - Ex-ante ER calculations

- ¹⁾
- TDfrMP : Temporary deviation from registered monitoring plan
 - TDfMM : Temporary deviation from the monitoring methodology
 - CrPDD : Corrections to the registered PDD
 - ChSD : Change to the start date of the crediting period
 - PCfrMP : Permanent changes from registered Monitoring Plan
 - PCfMM : Permanent changes from Monitoring Methodology
 - CoPD : Changes to the project design of a registered project activity / PoA
 - CstAR : Changes specific to afforestation or reforestation

2.3 Assessment team members and technical reviewers

As this assessment was carried out as part of the 5th verification of the project activity please refer to the main part of the verification report.

2.4 Assessment Steps

The *assessment of post registration changes* consisted of the following steps:

- Appointment of team members and technical reviewers
- A desk review of the registered and revised PDD^{/PDD/} submitted by the client and additional supporting documents
- On-Site assessment (if required)
- Background investigation and follow-up interviews with personnel of the project developer and its contractors,
- Resolution of corrective actions (CARs / CLs) (if any)
- Final reporting
- Technical review
- Final approval.

In this case all activities were carried out as part of the 5th verification of this project activity.

2.5 Review of Documents

The registered as well as the revised PDD and supporting background documents related to the project design and the post registration changes were reviewed.

As far as required the assessment team used additional documentation by third parties like host party legislation, technical reports referring to the project design or to the basic conditions and technical data.

2.6 Follow-up Interviews

The validation team has carried out interviews in order to assess the information included in the project documentation and to gain additional information regarding the compliance of the project with the relevant criteria applicable for CDM.

During validation the validation team has performed interviews to confirm selected information and to resolve issues identified in the document review. The main topics of the interviews are summarized in table 2-4.

Table 2-4: Interviewed persons and interview topics

Interviewed Persons / Entities	Interview topics
Project proponent representatives Project consultant	<ul style="list-style-type: none">- Details of the project validation and earlier verifications- Project history- Technical details of plant- Intended / implemented changes from the previous project design- Impact of changes on the additionality justification- Impact on the monitoring of the project- Editorial issues of the revised PDD

A comprehensive list of all interviewed persons is part of section 7 'References'.

2.7 Resolution of Clarification and Corrective Action Requests

2.7.1 Definition

A **Corrective Action Request (CAR)** will be established where:

- mistakes have been made in assumptions, application of the methodology or the project documentation which will have a direct influence the project results,
- the requirements deemed relevant for validation of the intended / implemented changes,
- there is a risk that the changes cannot be approved by the UNFCCC or that emission reductions would not be able to be verified and certified after the implementation of the changes.

A **Clarification Request (CL)** will be issued where information is insufficient, unclear or not transparent enough to establish whether a requirement is met.

2.7.2 Assessment

After reviewing all relevant documents and taken all other relevant information into account, the assessment team issues all findings (in the course of a draft report, if applicable) and hands over the findings to the project proponent in order to respond on the issues raised and to revise the documentation accordingly.

The final reporting step starts after resolution of the raised CARs and CLs. In case the findings from CARs and CLs cannot be resolved by the project proponent or the proposed action related to the FARs raised cannot be assessed as adequate, no positive assessment opinion can be issued by the validation team.

The CAR(s) / CL(s) / FAR(s) are documented in the context of the respective chapters.

2.8 Technical review

Before submission of the final assessment report a technical review is carried out. The technical reviewer is a competent GHG auditor being appointed for the scope this project falls under. The technical reviewer is not considered to be part of the verification team and thus not involved in the decision making process up to the technical review.

As a result of the technical review process the assessment opinion as prepared by the validation team leader may be confirmed or revised. Furthermore reporting improvements might be achieved.

2.9 Final approval

After successful technical review of the final report an overall (esp. procedural) assessment of the requested post registration changes will be carried out by a senior assessor located in the accredited premises of TÜV NORD.



Only after this step the notification or the report can be forwarded to the UNFCCC (in case of a positive validation opinion).

3 CHANGES THAT DO NOT AFFECT THE PROJECT DESIGN

3.1 Assessment of Changes

Requested Deviations / Changes #1

- Type of change(s):
- ☐ Temporary Deviation from Monitoring Plan
 - ☐ Temporary Deviation from Monitoring Methodology
 - ☒ Corrections that do not affect the project design
 - ☐ Permanent Change from Monitoring Plan
 - ☐ Permanent Change from Monitoring Methodology
 - ☐ Changes specific to afforestation or reforestation

A. Description of post registration change

Start Date: Please provide the start date of the change	2011-01-01	End Date: Please provide the end date of the change, if applicable	-
Description: Please give a detailed description of the changes	<p>The design production capacity of the Pulp Mill was corrected from 856,000 to 1,000,828.8 tons per year of bleached Kraft pulp.</p> <p>The first value is the authorized capacity by the Environmental Agency at the time of the project registration. This new one is the original design plant capacity which is the current capacity of Nueva Aldea pulp mill.</p> <p>The full assessment of this issue can be found in the CL D3 of the Verification Report to which this document is attached.</p>		

B. Assessment of post registration change – Corrections

Correctness: Please assess whether the corrected information (incl. ex-ante values) is an accurate reflection of actual project information.	<p>Even though the pulp mill is currently authorized to produce 1,200,000 ADt/year (Air dry tons of Kraft pulp per year)^{/EIA/}, the plant was design to produce an amount of 1,000.828.8 ADt/ year¹. This amount cannot be significantly surpassed without major investments in the plant mill. At this moment, Arauco cannot precise if this investment will take place in the pulp mill.</p>
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¹ This is 1,520 (ADt/d) (Maximum Continuous Rate capacity of a single line) x 2 (N° lines) x 93% (availability factor during a year) x 354 (operation days in a year) = 1,000,828.8 (ADt/yr). From this calculation, it is clear that if in a given year the availability factor is higher than 93% or if the operation days surpass 354, the pulp mill can potentially exceed its maximum expected production capacity of 1,000,828.8 (ADt/yr).

Requested Deviations / Changes #1

MP/MM Compliance : Please check whether the corrected parameters are in accordance with the MM and/or MP	The update of the plant capacity has no influence in the application of the methodologies. The plant has never changed its design capacity, however, when the mill was commissioned, it took time until it reaches its design capacity. The amount of biomass available to the project activity remains the same as could be assessed in the CL B3 described in the Verification Report to which this report is attached.
Appendix 1 PS: Check whether the affect the design of the PA.	This issue is described in the Appendix 1 of the Project Standard as a correction that does not affect the design of the project activity and does not require prior approval by the board. No changes in the design of the PA were performed to make the pulp mill reach this production capacity. The value of 1,000,828.8 ADt/year is the original design capacity. However, the capacity stated in the registered PDD is the one authorized by the Environmental Agency (856,000 ADt/year) at the time of registration.
C. Revised PDD	
Rev. of PDD: Check whether the changes have been fully addressed in a revised PDD.	<input checked="" type="checkbox"/> The changes have correctly been reflected in the revised PDD. <input type="checkbox"/> A revision of the PDD is not required (in case of temp. changes). <input checked="" type="checkbox"/> The revised PDD has been forwarded in (i) track-change and (ii) clean version.
D. Prior Approval	
Prior approval: Assess whether the change requires prior approval of the board	<input type="checkbox"/> <i>The post registration change requires prior approval</i> <input checked="" type="checkbox"/> <i>The post registration change does not require prior approval</i>

Requested Deviations / Changes #2

- Type of change(s):
- ☐ Temporary Deviation from Monitoring Plan
 - ☐ Temporary Deviation from Monitoring Methodology
 - ☒ Corrections that do not affect the project design
 - ☐ Permanent Change from Monitoring Plan
 - ☐ Permanent Change from Monitoring Methodology
 - ☐ Changes specific to afforestation or reforestation

A. Description of post registration change

Start Date: Please provide the start date of the change	2012-04-05	End Date: Please provide the end date of the change, if applicable	-
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Requested Deviations / Changes #2

<p>Description: Please give a detailed description of the changes</p>	<p>The list of changes below was already approved by the board on the Revised Monitoring plan (separate document). However, as they are different from the Registered PDD, and in order to unify both documents, they are listed below:</p> <ol style="list-style-type: none"> 1- The name of the methodology was corrected as per current Revised Monitoring Plan in section B.1 of the revised PDD. 2- Section B.6.1 of the revised PDD was replaced by sections D.2, D.2.1.4, D.2.3.2 and D.2.4 of the current revised monitoring plan which was approved on 2012-04-05. 3- Section B.6.2: as there was no place for the parameters fixed ex-ante in the old PDD template, the parameter ϵ_{el}, other plant(s) was now included in this section. 4- Section B.7.1: It was corrected and replaced by sections D.2.1.1, D.2.1.3 and D.3 of the revised monitoring plan. 5- Section B.7.2: It was included "Not applicable". 6- Section B.7.3 of the revised PDD: It was included section D.4 of the current Revised Monitoring plan. 7- Appendix 5 of the revised PDD. It was included the simplified line diagram of the instrument as per current revised Monitoring Plan 8- A table of project boundary was created in section B.3 of the revised PDD as it was not present in the registered PDD and was required by the new PDD template.
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B. Assessment of post registration change – Corrections

<p>Correctness: Please assess whether the corrected information (incl. ex-ante values) is an accurate reflection of actual project information.</p>	<p>Information is in accordance with the Revised Monitoring Plan</p>
<p>MP/MM Compliance : Please check whether the corrected parameters are in accordance with the MM and/or MP</p>	<p>Not Applied as it has already been approved in the Revised Monitoring plan.</p> <p>Regarding the issue # 3 above: the revised PDD was adapted to the new PDD template.</p> <p>Regarding the issue # 8 above: The table is in accordance with the Table 2 of the applied methodology ACM 0006 v.2.</p>
<p>Appendix 1 PS: Check whether the affect the design of the PA.</p>	<p>All these issues are described in the Appendix 1 of the Project Standard as corrections that do not affect the design of the project activity and does not require prior approval by the board.</p> <p>Regarding the issue # 3 above: the revised PDD was adapted to the new PDD template.</p> <p>Regarding the issue # 8: It is actually only the inclusion of information that was not included in the registered PDD.</p>

C. Revised PDD

Requested Deviations / Changes #2

Rev. of PDD: Check whether the changes have been fully addressed in a revised PDD.	<input checked="" type="checkbox"/> The changes have correctly been reflected in the revised PDD. <input type="checkbox"/> A revision of the PDD is not required (in case of temp. changes). <input checked="" type="checkbox"/> The revised PDD has been forwarded in (i) track-change and (ii) clean version.
D. Prior Approval	
Prior approval: Assess whether the change requires prior approval of the board	<input type="checkbox"/> <i>The post registration change requires prior approval</i> <input checked="" type="checkbox"/> <i>The post registration change does not require prior approval</i>

3.2 Related Findings

For a full assessment regarding the 1st requested deviation, please refer to CL D3 in the verification report to which this Annex 3 is attached.

4 CHANGE TO THE START DATE OF THE CREDITING PERIOD

The post registration changes do not fall under this category.

5 CHANGES TO THE PROJECT / PROGRAMME DESIGN

5.1 Assessment of Changes

Requested Changes to the project design #3

Type : ☒ *Changes to the project design*

☐ *Changes to the PoA design*

A. Description of post registration change

Start Date:

Please provide the start date of the change

2011-01-01

End Date:

Please provide the end date of the change, if applicable

-

Description:

Please give a detailed description of the changes esp. with regards to the effect on the project design.

Fuel oil has been included as a type of fossil fuel to be co-fired in the project activity as a back-up fuel.

B. Applicability and application of the Approved Baseline Methodology

Requested Changes to the project design #3

Description:

Please give a detailed description on how the changes affect the applicability and application of the approved Baseline Methodology. Check if the actual changes would adversely affect the conclusions during validation.

The requested change only adds another type of fossil fuel to be co-fired in the project activity which is the fuel oil. The revised monitoring plan approved on 2012-04-03 specified only diesel and natural gas as the fossil fuels co-fired in the plant.

The reason why no change in the monitoring plan was proposed in this case is because there was no change in the way the parameter $FF_{\text{project Plant},i,y}$ is measured. The same meters that measured initially the diesel will be measuring the fuel oil. Furthermore their accuracy and calibration period will also be the same.

The applied methodology does not prevent the use of fuel oil as fossil fuel. Furthermore the proposed change does not affect the applicability and application of the approved Baseline Methodology (ACM 0006 v.2) as the baseline scenario will still be the #4 of the above methodology:

- “The proposed project activity involves the installation of a new biomass residue power generation plant at a site where no power was generation occurs”
- “In the absence of this project activity, a new biomass residue fired power plant would be installed instead of the project activity at the same site and with the same thermal firing capacity but with a lower efficiency of electricity generation as the project plant”.
- “The same type and quantity of biomass residues as in the project plant would be used in the baseline plant”.
- The power generated by the project plant would in the absence of the project activity be generated:
 - In the reference plant.
 - Partly in power plants in the grid.
- “The heat generated by the project plant would in the absence of the project activity be generated in the reference plant”.

The actual changes will not affect the conclusions of the validation process.

C. Additionality assessment

Requested Changes to the project design #3

Description:

Please give a detailed description re-assessment of additionality. Check whether the actual changes would adversely affect the conclusions during validation. If required please make use of the assessment tables in the annex.

Methodology:

The justification of the additionality in the original project documentation was done in line with the requirements of the ACM 0006 v.2 and "Tool for the demonstration and assessment of additionality".

Decisive Route of Addtionality Justification

During the original validation of the project the additionality was justified on the basis of a barrier analysis and this proposed change (inclusion of another type of back-up fossil fuel) in any way affect the additionality of the project activity. The barriers presented in the original validation were:

- Investment barriers: no change in equipments has been done in order to include other backup fossil fuel to be co-fired in the plant. Thus this barrier is not affected.
- Technological barriers: the same meters are used for diesel and fuel oil. Thus, no change in technology was observed and this barrier is not affected.
- Barriers due to prevailing practice: the inclusion of other fuel type to be co-fired in the project does not affect this barrier.
- Cultural barriers: the inclusion of other fuel type to be co-fired in the project does not affect this barrier.
- Barriers to entry in the electric power industry: the inclusion of other fuel type to be co-fired in the project does not affect this barrier.

Re-Assessment of Additionality

During the original validation of the project the additionality was justified on the basis of a barrier analysis and this proposed change (inclusion of another type of back-up fossil fuel) in any way affects the additionality of the project activity.

The change in the fossil fuel used in the project activity occurred for strategic reasons due to a shortage of natural gas since natural gas was provided by Argentina. Additionally to diesel, the company is using fuel oil as a back-up fuel..

The verification team considers that using fuel oil in the project activity is still in accordance with the revised Monitoring Plan due to the following reasons:

Requested Changes to the project design #3

	<ul style="list-style-type: none"> - The fuel oil is measured by exactly the same meters as those used for the diesel and under the same conditions, which could be confirmed by the verification team during the on-site visit. - The accuracy of measurements are equal for both fuels as the meters are the same - The accuracy level of instruments are kept the same - The records frequency of measurements are the same for both fuels - The calibration frequency are still in line with described in the revised monitoring plan - The calculation of emission factor of the fuel oil follows the same guidance as of the diesel and the parameters were all obtained according to required by the monitoring plan. - The applied methodology states the generic use of any fossil fuel is allowed. - Finally, the monitoring system for the measuring of natural gas consumption is still in place and fulfils the QA/QC described in the monitoring plan <p><u>Result of Additionality Re-Assesement</u></p> <p>The validation team concludes that the additionality of the project is not affected by the technical changes carried out as a deviation from the project design originally validated and registered. For further assessment please refer to CL C4 in the Verification report.</p>
D. Scale of the Project activity	
<p>Description:</p> <p>Please give a detailed regarding the effect of the changes on the scale of the PA (i.e. LSC or SSC).</p>	<p>No change in the capacity of the plant occurred due to the proposed change. Thus no change on the scale of the PA has been observed.</p>
E. Revised PDD	

Requested Changes to the project design #3

<p>Rev. of PDD:</p> <p>Check whether the changes have been fully addressed in a revised PDD. In this context pl. refer to</p> <ul style="list-style-type: none"> - Changes in the effective output capacity. - Addition of components or extension of technology - In case of multiple site projects: Removal or addition of sites - Operational parameters under the control of PPs differing from expected parameters - Changes to the baseline Meth (e.g. addition of a new Meth or change of the BL scenario. - Effects with regards to B, C and D above incl. compliance with the MP and level of accuracy and completeness of monitoring. 	<p>The post registration change has correctly been reflected in the revised PDD. This assessment is based on the following considerations:</p> <ul style="list-style-type: none"> - Fuel oil was included as a fossil fuel to be co-fired in the project plant in the description of the parameter $FF_{\text{project plant},i,y}$ in the Monitoring Plan. - No components were added as the same meters that measure the diesel will be responsible to measure the fuel oil <input checked="" type="checkbox"/> - No further parameters were added in the Monitoring plan - No changes in the baseline methodology and/or baseline scenario were observed due to the proposed change. - The meters kept the same level of accuracy and calibration frequency. - The applied methodology does not prevent the use of fuel oil as fossil fuel. - No change in the accuracy of the monitoring plan was observed due to the application of the proposed change.
<p>Traceability:</p> <p>Check if the PPs have provided a revised PDD in both clean and track-change version.</p>	<p><input checked="" type="checkbox"/> The revised PDD has been forwarded in (i) track-change and (ii) clean version.</p>
<p>F. Prior Approval</p>	
<p>Prior approval:</p> <p>Assess whether the change requires prior approval of the board.</p>	<p>The changes do not raise concerns with respect to aspects outlined in the PS:</p> <ul style="list-style-type: none"> a. applicability and application of the Approved Baseline Methodology under which the project activity has been registered. b. additionality of the project c. scale of the CDM project activity and <p>Prior Approval by the Board is not required.</p> <p><input type="checkbox"/> The post registration change requires prior approval.</p>

Requested Changes to the project design #4

Type : ☒ Changes to the project design

☐ Changes to the PoA design

Requested Changes to the project design #4

A. Description of post registration change

Start Date:

Please provide the start date of the change

2011-01-01

End Date:

Please provide the end date of the change, if applicable

-

Description:

Please give a detailed description of the changes esp. with regards to the effect on the project design.

The PP updated the data related to the pulp mill conditions calculated based on real operational data. The original data was based on estimations using benchmark information and data available at the purchase of the equipments.

The following changes were performed:

- The PP is using the NCV measured by a specialized and reputed laboratory (10.70 GJ/tDS) instead using the original estimated value (11.38 GJ/tDS)

As a result of this change, the following corrections have to be made:

- recovery boiler capacity changed from 4,686 tDS/d to 5,049 tDS/d of black liquor (tDS/d is equal to tons of dry solids per day)
- As a consequence:
 - the change in the total power generation of the power plant: initially estimated in 113.5 MW it was now updated to 110.1 MW due to observations of the turbogenerators' efficiency during operations. This value is used to calculate the parameter "Efficiency of the reference plant" ($\epsilon_{el, other\ plant(s)}$) applied in the equation 13 of the ACM0006 (Version 02). Nevertheless, the turbogenerators are still the same equipment as in the validation period.
 - Also, change in the plant power consumption: this value was updated from the estimated 76 MW to 69.2 MW. Likewise, this data was based on calculations using current plant operational data. This difference occurred as the initial data was obtained from vendors performance guarantees and not from real data. Change in the power export capacity. As a result of the modifications informed above, the power export capacity also changed from 37.5 MW to 41.7 MW. The value presented in the Registered PDD was rounded down (37 MW) during the validation process. The updated value is perfectly understood by reducing the updated power generation of the plant (110.9 MW) from the plant power consumption (69.2 MW) resulting in: $110.9 - 69.2 = 41.7$ MW. However it is very important to point out that this increase in the power export capacity will not affect the ER calculations for the period. The reason is that the calculation of ER is performed through the equation 13 of the ACM 0006 V.2 which does not consider directly the energy exported to the electric system.

Requested Changes to the project design #4

$$EG_y = EG_{\text{project plant}, y} - \epsilon_{\text{el.other plant(s)}} * \sum BF_{i,y} * NCV_i$$

where

EG_y : Net quantity of increased electricity generation

EG_{project plant}: Net quantity of electricity generated in the Project (Gross electricity generated – auxiliary electricity consumption)

$\epsilon_{\text{el.other plant(s)}} * \sum BF_{i,y} * NCV_i$: Baseline electricity generation

The parameter $\epsilon_{\text{el.other plant(s)}}$ (electric efficiency of the reference plant) has decreased according to the table below as a result of the calculation update and use of the real NCV: It only takes into consideration data from the reference plant.

Parameter	Units	Reference plant	Reference plant (with recalculation using actual values)
$\epsilon_{\text{el.other plant(s)}}$	(GWh _{el} /GWh _{bio})	10.839%	10.779%

The change in the capacity of the pulp mill presented above is due to the difference in the way of calculation and due to change in the NCV value (using the measured instead of the taken from the literature). The consulting company used actual data obtained from plant operations.

The reason for the plant capacity (ADt/day of black liquor) and NCV differences between the measured and the estimated (approx. 6%) are explained below:

- According to the consulting company AF Celpap^{/CONSULT/}, it is expected to obtain until 4% difference in the black liquor capacity due to the digester performance and operational parameters between the estimated ex-ante and the actual data. As per explanation sent to the verification team and confirmed through evidences^{/CONSULT/}, the initial capacity was a result of calculations based in assumptions such as cooking yield, bleaching losses, alkali charge, etc.
- Furthermore, both data (capacity and NCV) were obtained empirically without recirculation of ash in the black liquor. The inclusion of the ash causes an “increase” in the black liquor flow and “decrease” or “dilution” of the NCV values due to its inert properties.
- By adding up the 4% expected difference plus the recirculation of ash, it is possible to attest confirm the difference found (6%).

Requested Changes to the project design #4

Nevertheless, a comment shall be done regarding the concentration of the black liquor:

As per description of the finding CL B3 presented in the Verification Report (pg 30) to which this assessment is attached, and in the registered PDD (pgs 10 and 11), the concentration of the black liquor burned in the project plant (project activity) “would not be altered due to the optimization project” and neither due to the update of calculations. It will be kept the same and equal to 80%. 72% is the solid concentration of the black liquor in the reference plant (baseline scenario).

The change of the above parameters will not cause an increase in the ex-ante estimation of GHG emission reductions described in the registered PDD but a reduction. This reduction occurs because the way of calculation of the estimated ER in the section B.6.4 of the revised PDD has been updated as per equation 13 of the applied methodology (ACM 0006 v.2). This equation is a requirement of the applied methodology and it was used to calculate the actual ER of the project activity. The application of the equation was approved by the board on 2012-04-05. However, the approved equation was not applied to the Estimation of ERs in the section B.6.4 of the registered PDD at the time of this PRC from 2012-04-05. Thus, the ER estimations for the crediting period were recalculated using the updated values. A reduction of yearly total Ex-ante estimations has been observed.

The influence of this measure will be assessed below.

The proposed change in the parameter NCV_i and in the way of calculation, taking into consideration real data, will result in a change in the parameter $\epsilon_{el, other \text{ plant(s)}}$ which will cause an increase in the actual ER for this period. However, the verification team comprehends that the data used to calculate the emission reductions is now more representative as it is based on actual measurements of the process to generate the values of the reference plant. The following sections of this report will assess the influence of this change in the applicability of the applied methodology, additionality and scale of the project activity. No changes in these three parameters have been observed. And for this reason no prior approval is being requested.

B. Applicability and application of the Approved Baseline Methodology

Requested Changes to the project design #4

Description:

Please give a detailed description on how the changes affect the applicability and application of the approved Baseline Methodology. Check if the actual changes would adversely affect the conclusions during validation.

The requested change updates the plant capacity to a more reliable values based on actual data. The result of this update is a reduction of the annual ex-ante estimated GHG emission for this crediting period due to the application of formula 13 of the ACM 0006 V.2, which was not considered in the previous version of the PDD. Furthermore, the use of the equation 13 of the applied methodology is perfectly within its own applicability.

The proposed change does not affect the applicability and application of the approved Baseline Methodology (ACM 0006 v.2) as the baseline scenario will still be the #4 of the above methodology:

- “The proposed project activity involves the installation of a new biomass residue power generation plant at a site where no power was generation occurs”
- “In the absence of this project activity, a new biomass residue fired power plant would be installed instead of the project activity at the same site and with the same thermal firing capacity but with a lower efficiency of electricity generation as the project plant”.
- “The same type and quantity of biomass residues as in the project plant would be used in the baseline plant”.
- The power generated by the project plant would in the absence of the project activity be generated:
 - In the reference plant.
 - Partly in power plants in the grid.
- “The heat generated by the project plant would in the absence of the project activity be generated in the reference plant”.

The actual changes will not affect the conclusions of the validation process. Please refer to all changes in PDD regarding this PRC in the section “Rev of PDD” in this same table below.

C. Additionality assessment

Requested Changes to the project design #4

Description:

Please give a detailed description re-assessment of additionality. Check whether the actual changes would adversely affect the conclusions during validation. If required please make use of the assessment tables in the annex.

Methodology:

The justification of the additionality in the original project documentation was done in line with the requirements of the ACM 0006 v.2 and "Tool for the demonstration and assessment of additionality".

Decisive Route of Additionality Justification

During the original validation of the project the additionality was justified on the basis of a barrier analysis and this proposed change (update of the plant data and recalculation of estimated GHG emission reductions) in any way affect the additionality of the project activity. The barriers presented in the original validation were:

- Investment barriers: no change in equipments has been done. Only the calculations now use actual data to estimate the efficiency of the reference plant to apply the equation 13 of the AMC 0006 v.2. Thus this barrier is not affected.
- Technological barriers: No change in technology has been done in the project activity. Thus this barrier is not affected.
- Barriers due to prevailing practice: the change in the calculation does not affect this barrier.
- Cultural barriers: the change in the calculation does not affect this barrier.
- Barriers to entry in the electric power industry: the change in the calculation does not bring any incentives or affect the conditions of the company.
- Common practice: The change in the calculations does not affect the common practice analysis done in the validation process. Cogeneration of electricity to export does not consist in a common practice in Chile.

Re-Assessment of Additionality

During the original validation of the project the additionality was justified on the basis of a barrier analysis and this proposed change (update of the reference plant data and recalculation of estimated GHG emission reductions) in any way affect the additionality of the project activity.

Requested Changes to the project design #4

	<p><u>Result of Additionality Re-Assessment</u></p> <p>The verification team observed that no change in the additionality criteria is observed by using the actual values of the plant capacity and by updating equation for calculating the ER estimations. It is only resulting in a conservative measure as it reduces the estimated ER for the current crediting period when comparing to the registered PDD. Even though the change will cause an increase in the actual ER for this monitoring period the verification team comprehends that the data used to calculate the emission reductions is now more representative as it is based in actual measurements of the process to generate the values of the reference plant.</p> <p>The validation team concludes that the additionality of the project is not affected by the changes carried out as a deviation from the project design originally validated and registered. For further assessment please refer to CL B3 in the Verification Report to which this report is attached.</p>
D. Scale of the Project activity	
<p>Description:</p> <p>Please give a detailed regarding the effect of the changes on the scale of the PA (i.e. LSC or SSC).</p>	<p>The change in the capacity of the plant did not cause a change in the scale of the PA as it is already a LSC.</p>
E. Revised PDD	

Requested Changes to the project design #4

Rev. of PDD:

Check whether the changes have been fully addressed in a revised PDD. In this context pl. refer to

- Changes in the effective output capacity.
- Addition of components or extension of technology
- In case of multiple site projects: Removal or addition of sites
- Operational parameters under the control of PPs differing from expected parameters
- Changes to the baseline Meth (e.g. addition of a new Meth or change of the BL scenario.
- Effects with regards to B, C and D above incl. compliance with the MP and level of accuracy and completeness of monitoring.

- The proposed change will cause an increase in the actual ER for this monitoring period. However, the verification team comprehends that the data used to calculate the emission reductions is now more representative as it is based in actual measurements of the process to generate the values of the reference plant.
- No change in components or extension of technology has been observed.
- The operational parameters changed are now based on real data and the estimations of the reference plant are now more reliable than in the validation phase.
- With the update of the reference data, the baseline scenario has changed: The consequence of that is the decrease of the parameter $\epsilon_{el, other \text{ plant(s)}}$ (electric efficiency of the reference plant) resulting in an increase of the actual ER obtained in the period as per equation 13 of the ACM0006 v.2.
- No changes in the additionality, scale and compliance with applied methodology have been observed. The level of accuracy is considered higher as real data have been used whereas estimating the reference plant efficiency.

The post registration change has correctly been reflected in the revised PDD. In order to deal with this PRC the following corrections were performed in the revised PDD.



- Front page: Reduction of estimated amount of annual average GHG ERs to 150,805 tCO₂;
- Section A.1: change in the text including the new values of power export, power consumption and power generation.
- Section A.3: The diagrams of the plant with and without the implementation of the project activity were updated with the new energy/mass balance data.
- Section B.6.1: description of the change of the calculation of the parameter $\epsilon_{el, other \text{ plant(s)}}$ and change of its result to 10.779%;
 - Update of the ex-ante calculation using the new values;
 - Update of tables in the ER calculation section;
- The section B.6.3 was updated to the new estimated GHG ER calculations.
- Section B.6.4: update of the ex-ante estimated ERs and the table template to comply with the guidelines to completing the PDD;

Section B.7.1: update of the values applied for the following parameters:

Requested Changes to the project design #4

Rev. of PDD: (cont.)

- **BF_{i,y}** (quantity of black liquor fueled in the project plant during the year): value applied in the ex-ante calculations is 5,049 tDS/d as a result of the calculations update performed by KSH Consulting ^{/CONSULT/} and by the update of the NCV value.
- **EF_y, EF_{OM} and EF_{BM} (Electricity Emission factor)** the data used for these parameters in the ex ante calculations are as per explanation:
 - 2007 the ones obtained in the original PDD
 - 2008 to 2012, the ones obtained in the previous monitoring periods
 - 2013 and 2014 based on the last available data (2012)
- **NCV_i (Net calorific value of biomass type i per mass or volume of biomass)**: the value changed to the measured by a specialized laboratory: 2.97 (MWh/tDS) or 10.70 (GJ/tDS) instead of the obtained from literature (3.16 MWh/tDS or 11.38 GJ/tDS). The difference is explained in CL B3 in the Verification Report to which this report is attached.

- **EG_{project plant,y}, EL_{PJ,gross,y} and EL_{PJ,aux,y}**: the values applied in the ex-ante calculations for the three parameters were included in this section. These values were obtained from the updated calculations provided by KSH Consulting. They were obtained as following:



$$EG_{\text{project plant}} = EL_{PJ,\text{gross},y} - EL_{PJ,\text{aux},y}$$

$$EL_{PJ,\text{gross},2007} = 110.9 \text{ (MW)} * 8,760 \text{ hrs} * 60\% = 582,890 \text{ (MWh/y)}$$

$$EL_{PJ,\text{gross},2008-2014} = 110.9 \text{ (MW)} * 8,760 \text{ hrs} * 80\% = 777,187.2 \text{ (MWh/y)}$$

Where:

110.9 (MW) = TG3 (55.3MW) + TG2 (55.6MW) obtained from the project case energy/mass balance updated.

60% for 2007 and 80% for the period 2008-2014 are the plant load factors stated in the original PDD of the emission reduction calculations. Source: CDEC-SIC and Nueva Aldea estimates.

$$EL_{PJ,\text{aux},2007} = 10.0 \text{ MW} * 8,760 \text{ hrs} * 60\% = 52,560 \text{ (MWh/y)}$$

and

$$EL_{PJ,\text{aux},2008-2014} = 10.0 \text{ MW} * 8,760 \text{ hrs} * 80\% = 70,080 \text{ (MWh/y)}$$

Where

10.0 MW is the auxiliary electricity consumption capacity obtained from the project case energy/mass balance updated.

Therefore:

- $EG_{\text{project plant},2007} = 582,890 \text{ (MWh/y)} - 52,560 \text{ (MWh/y)} = 530,330 \text{ (MWh)}$.
- $EG_{\text{project plant},2008-2014} = 777,187.2 \text{ (MWh/y)} - 70,080 \text{ (MWh/y)} = 707,107 \text{ (MWh)}$.

Requested Changes to the project design #4

Traceability: Check if the PPs have provided a revised PDD in both clean and track-change version.	<input checked="" type="checkbox"/> The revised PDD has been forwarded in (i) track-change and (ii) clean version.
F. Prior Approval	
Prior approval: Assess whether the change requires prior approval of the board.	<div data-bbox="485 636 523 860" style="text-align: center;"> <input checked="" type="checkbox"/> </div> <p>The changes do not raise concerns with respect to aspects outlined in the PS:</p> <ul style="list-style-type: none"> d. applicability and application of the Approved Baseline Methodology under which the project activity has been registered. e. additionality of the project f. scale of the CDM project activity and <p>Prior Approval by the Board is not required.</p> <div data-bbox="485 1070 523 1115" style="text-align: center;"> <input type="checkbox"/> </div> <p>The post registration change requires prior approval.</p>

5.2 Related findings

Please refer to the findings in the Verification Report to which this assessment report is attached.

6 SUMMARY OF ASSESSMENT OPINIONS

The below listed changes have occurred after the registration of the project / PoA.

Type of Change occurred	Total No. of changes	No. of changes which require prior approval
<input type="checkbox"/> Temporary deviations from the MP	-	-
<input type="checkbox"/> Temporary deviations from the MM	-	-
<input checked="" type="checkbox"/> Corrections that do not affect the project	2	-
<input type="checkbox"/> Change to the start date of the crediting p.	-	-
<input type="checkbox"/> Permanent changes from the MP	-	-
<input type="checkbox"/> Permanent changes from the MM	-	-
<input checked="" type="checkbox"/> Design changes to the project activity / PoA	2	-
<input type="checkbox"/> Changes specific to AR projects	-	-

None of the changes requires prior approval of the Board.

The revised PDD is in accordance with the registered PDD and with the Revised Monitoring Plan and no discrepancies have been observed apart from the changes described in this document.

Essen, 2014-07-25



Emilio Martin
TÜV NORD JI/CDM CP
Assessment Team Leader

Essen, 2014-07-25



Martin Saalman
TÜV NORD JI/CDM CP
Final Approval

7 REFERENCES

All references are listed in the Verification Report to which this assessment is attached.

APPENDIX

- A1:** Assessment of Financial Parameters
- A2:** Assessment of Barrier analysis
- A3:** Competence statements of involved personnel

APPENDIX 1: ASSESSMENT OF FINANCIAL PARAMETERS

Table A-1: Assessment of Financial Parameters (VVS, v. 2.0, §§ 120, 121 / in case financial parameters stem from FSR §122)

<input checked="" type="checkbox"/>	No financial parameters are used for additionality justification					
<input type="checkbox"/>	Assessment of all financial parameters see below					
Parameter	Value applied	Unit	Source of Information (please indicate document and page)	Reference	DOE ASSESSMENT	
					Correctness of value applied	Comment
				//	<input type="checkbox"/>	
				//	<input type="checkbox"/>	
				//	<input type="checkbox"/>	
				//	<input type="checkbox"/>	
				//	<input type="checkbox"/>	
				//	<input type="checkbox"/>	
				//	<input type="checkbox"/>	

APPENDIX 2: ASSESSMENT OF BARRIER ANALYSIS

Table A-2: Assessment of Barrier Analysis (VVS, v. 2.0, §§ 124-127)

<input checked="" type="checkbox"/>		No barrier parameters are used for additionality justification		
<input type="checkbox"/>		Assessment of barriers see below		
Kind of Barrier (invest, tech, other)	Description of Barrier	Evidence used	Assessment of validation team	
			Appropriateness of information source	Explanation of final result
			<input checked="" type="checkbox"/>	
			<input checked="" type="checkbox"/>	
			<input checked="" type="checkbox"/>	
			<input checked="" type="checkbox"/>	
			<input checked="" type="checkbox"/>	
			<input checked="" type="checkbox"/>	
			<input checked="" type="checkbox"/>	

APPENDIX 3: STATEMENTS OF COMPETENCE OF INVOLVED PERSONNEL

TÜV NORD Certification																																																																		
<p>Statement of Competence Appointment and authorization according to the procedures of the TÜV NORD JI/CDM Certification Program</p> <p>Mr. Gilberto Gomes Andrade</p> <table border="1"> <thead> <tr> <th>SCHEME</th> <th>STATUS</th> <th>VALID UNTIL</th> </tr> </thead> <tbody> <tr> <td>CDM</td> <td>Assessor (Validation, Verification)</td> <td>2016-01-25</td> </tr> <tr> <td>VCS / ISO 14064-2</td> <td>Assessor</td> <td>2016-01-25</td> </tr> </tbody> </table> <p>Authorization status for technical areas within sectoral scopes:</p> <table border="1"> <thead> <tr> <th>CODE</th> <th>TECHNICAL AREA</th> </tr> </thead> <tbody> <tr> <td>1.1</td> <td>Thermal Energy Generation</td> </tr> <tr> <td>1.2</td> <td>Renewable Energies</td> </tr> <tr> <td>2.1</td> <td>Electricity Distribution</td> </tr> <tr> <td>5.1</td> <td>Chemical Process Industries</td> </tr> <tr> <td>11.1</td> <td>Chemical Process Industries</td> </tr> <tr> <td>12.1</td> <td>Chemical Process Industries</td> </tr> </tbody> </table> <p>016 - Rev. 1, Date: 2013-01-26</p> <p>016_S01-VA060-F20_2013-01-21_rev1.doc</p> <p>S01-VA060-F20 rev3 / 2012-10-25</p>			SCHEME	STATUS	VALID UNTIL	CDM	Assessor (Validation, Verification)	2016-01-25	VCS / ISO 14064-2	Assessor	2016-01-25	CODE	TECHNICAL AREA	1.1	Thermal Energy Generation	1.2	Renewable Energies	2.1	Electricity Distribution	5.1	Chemical Process Industries	11.1	Chemical Process Industries	12.1	Chemical Process Industries	<p>Statement of Competence Appointment and authorization according to the procedures of the TÜV NORD JI/CDM Certification Program</p> <p>Mr. Martin Saalmann</p> <table border="1"> <thead> <tr> <th>SCHEME</th> <th>STATUS</th> <th>VALID UNTIL</th> </tr> </thead> <tbody> <tr> <td>CDM</td> <td>Senior Assessor (Validation, Verification) Technical Reviewer</td> <td>2015-05-15</td> </tr> <tr> <td>J1</td> <td>Senior Assessor Technical Reviewer</td> <td>2015-05-15</td> </tr> <tr> <td>VCS / ISO 14064-2</td> <td>Senior Assessor Technical Reviewer</td> <td>2015-05-15</td> </tr> </tbody> </table> <p>Authorization status for technical areas within sectoral scopes:</p> <table border="1"> <thead> <tr> <th>CODE</th> <th>TECHNICAL AREA</th> <th>TR SUBCATEGORIES</th> </tr> </thead> <tbody> <tr> <td>1.2</td> <td>Renewable energies</td> <td>1.2.4 Solar</td> </tr> <tr> <td>13.1</td> <td>Waste management and disposal</td> <td>13.1.1 Waste management 13.1.2 Waste water management</td> </tr> </tbody> </table> <p>022 - Rev. 4, Date: 2012-05-16</p> <p>022_S01-F003_2012-05-16 rev4</p> <p>S01-F003 rev2 / 2012-04-05</p>	SCHEME	STATUS	VALID UNTIL	CDM	Senior Assessor (Validation, Verification) Technical Reviewer	2015-05-15	J1	Senior Assessor Technical Reviewer	2015-05-15	VCS / ISO 14064-2	Senior Assessor Technical Reviewer	2015-05-15	CODE	TECHNICAL AREA	TR SUBCATEGORIES	1.2	Renewable energies	1.2.4 Solar	13.1	Waste management and disposal	13.1.1 Waste management 13.1.2 Waste water management	<p>Statement of Competence Appointment and authorization according to the procedures of the TÜV NORD JI/CDM Certification Program</p> <p>Mr. Emilio Martin</p> <table border="1"> <thead> <tr> <th>SCHEME</th> <th>STATUS</th> <th>VALID UNTIL</th> </tr> </thead> <tbody> <tr> <td>CDM</td> <td>Senior Assessor (Validation, Verification) Technical Reviewer</td> <td>2016-02-04</td> </tr> <tr> <td>VCS / ISO 14064-2</td> <td>Senior Assessor</td> <td>2016-02-04</td> </tr> </tbody> </table> <p>Authorization status for technical areas within sectoral scopes:</p> <table border="1"> <thead> <tr> <th>CODE</th> <th>TECHNICAL AREA</th> <th>TR SUBCATEGORIES</th> </tr> </thead> <tbody> <tr> <td>1.2</td> <td>Renewable Energies</td> <td>1.2.1 Hydro 1.2.2 Wind 1.2.3 Geothermal 1.2.4 Solar 1.2.5 Total</td> </tr> <tr> <td>13.1</td> <td>Waste Handling and Disposal</td> <td>13.1.1 Waste Management 13.1.2 Waste Water Management</td> </tr> </tbody> </table> <p>157 - Rev. 3, Date: 2013-02-05</p> <p>157_S01-VA060-F20_2013-02-05_rev3.doc</p> <p>S01-VA060-F20 rev3 / 2012-10-25</p>	SCHEME	STATUS	VALID UNTIL	CDM	Senior Assessor (Validation, Verification) Technical Reviewer	2016-02-04	VCS / ISO 14064-2	Senior Assessor	2016-02-04	CODE	TECHNICAL AREA	TR SUBCATEGORIES	1.2	Renewable Energies	1.2.1 Hydro 1.2.2 Wind 1.2.3 Geothermal 1.2.4 Solar 1.2.5 Total	13.1	Waste Handling and Disposal	13.1.1 Waste Management 13.1.2 Waste Water Management
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Statement of Competence
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of the TÜV NORD JI/CDM Certification Program

Mr. Stefan Winter

SCHEME	STATUS	VALID UNTIL
CDM	Senior Assessor (Validation, Verification) Technical Reviewer	2014-06-30
VCS	Senior Assessor (Validation, Verification) Technical Reviewer	2014-06-30

Authorization status for technical areas within sectoral scopes:

CODE	TECHNICAL AREA	TR SUBCATEGORIES
1.1	Thermal energy generation	
1.2	Renewable Energy	1.2.1 Hydro 1.2.2 Wind 1.2.3 Geothermal 1.2.4 Solar 1.2.5 Tidal
2.2	Heat distribution	
3.1	Energy demand	
13.1	Waste handling and disposal	13.1.1 Waste management 13.1.2 Waste water management
13.2	Animal waste management	
15.2	Animal waste management	

163 – Rev. 2, Date: 2011-08-10

163_S01-F003_2011-08-10_rev2

Statement of Competence
Appointment and authorization according to the procedures
of the TÜV NORD JI/CDM Certification Program

Mr. Marcelo Sebben

SCHEME	STATUS	VALID UNTIL
CDM	Lead Assessor (Validation, Verification)	2016-04-07
VCS / ISO 14064-2	Assessor	2016-04-07

Authorization status for technical areas within sectoral scopes:

CODE	TECHNICAL AREA	TR SUBCATEGORIES
1.2	Renewable energies	
13.1	Waste handling and disposal	

297 - Rev. 3 Date: 2013-08-22

297_S01-VA060-F20_2013-08-22_rev3