

# Validation Report

Report for:  
Hi-Tech Activated Carbon Sdn. Bhd.

Validation of CDM project for  
Co-composting of Palm Oil Mill Waste at Keratong

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## Contents

<b>1</b>	<b><i>Executive Summary</i></b> .....	<b>3</b>
<b>2</b>	<b><i>Introduction</i></b> .....	<b>7</b>
2.1	Objective.....	7
2.2	Scope.....	7
2.3	GHG Project Description.....	8
<b>3</b>	<b><i>Methodology</i></b> .....	<b>8</b>
3.1	Review of documents.....	8
3.2	Site Visit & Follow-up interviews .....	9
3.3	Resolution of clarification and corrective action requests.....	9
3.4	Internal quality control.....	10
<b>4</b>	<b>Validation protocol and conclusions</b> .....	<b>10</b>
4.1	Approval .....	10
4.2	Participation requirements .....	11
4.3	Project design document.....	11
4.4	Project description .....	11
4.5	Baseline and monitoring methodology.....	13
4.6	Additionality of a project activity.....	14
4.7	Monitoring Plan .....	16
4.8	Local stakeholder consultation.....	16
4.9	Environmental impacts.....	16
4.10	Summary of Changes.....	17
<b>5</b>	<b><i>Comments by parties, stakeholders and NGOs</i></b> .....	<b>18</b>
<b>6</b>	<b><i>Validation Opinion</i></b> .....	<b>19</b>
<b>7</b>	<b><i>Appendices</i></b> .....	<b>21</b>
7.1	Appendix A: Letter of approval for the project by the host and investing country DNA .....	21
7.2	Appendix B: List of documents reviewed .....	21
7.3	Appendix C: List of persons interviewed .....	23
7.4	Appendix D: How due account has been taken to the public input made to the validation requirements.....	23
7.5	Appendix E: Certificate of Appointment.....	24
7.6	Appendix F: Validation Protocol and findings log .....	25

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## 1 Executive Summary

Lloyd's Register Quality Assurance Limited has been contracted by Hi-Tech Activated Carbon Sdn. Bhd., representing the project participants (PP), to undertake validation of the proposed project activity, "Co-composting of Palm Oil Mill Waste at Keratong". The validation has been performed through a process of document review based on the project design document, Version 1.1 dated 11/11/2007 initially submitted for validation and the subsequent revisions, follow-up interviews with the stakeholders, resolution of outstanding issues and issuance of the validation report.

The Tee Teh Palm Oil Mill located at Keratong, Pahang in the proposed project activity has a processing capacity of 20 tonnes of fresh fruit bunches (FFB) an hour and proposes to increase to 45 tonnes of fresh fruit bunches per hour from year 2 of the crediting period. The Empty Fruit Bunches (EFB) are currently deposited at an unmanaged dump site (solid waste disposal site SWDS) near the mill, where it is left to decompose anaerobically, consequently releasing methane emissions to the atmosphere. Palm Oil Mill Effluent (POME) is moved into retaining ponds where it oxidises anaerobically for a period up to 20 days before the effluent is allowed to be discharge into a nearby river.

The proposed CDM project activity envisages co-composting of EFB and POME at the mill site that will aerobically treat EFB and POME, thus avoiding free emission of methane into the atmosphere. The co-composting project avoids methane emission from uncontrolled EFB landfill disposal and from the anaerobic treatment process of POME in retaining ponds. The estimated GHG emission reductions are 37,170 tCO<sub>2</sub>e per annum on average. In fixed crediting period of 10 years, the total Emission Reductions are estimated to be 371,696 tCO<sub>2</sub>e.

The fulfilment of the requirements as set forth in Article 12 of the Kyoto Protocol of the United Nations Framework Convention on Climate Change (UNFCCC), the modalities and procedures for a CDM (CDM M&P) and relevant decisions of the Conference of the Parties, serving as meeting of the Parties to the Kyoto Protocol (COP/MOP) and the Executive Board of the CDM (CDM-EB) have been evaluated and conformance to the validation requirements were confirmed based on the given information. A risk based approach was taken to conduct the validation and corrective action requests (CARs) and clarifications (CLs) were raised for relevant actions by the PP.

The validation team has found through the validation process 9 CARs and 1 CL. The PP has taken actions and submitted to LRQA a revised PDD, revised Emission Reduction and Investment analysis spreadsheet and relevant supporting evidence.

The validation team is of the opinion that the proposed project activity as described in the project design document version 3.5 dated 21/11/2012 meets all the relevant UNFCCC requirements for the CDM, as well as the host country's national requirements and if implemented as designed, is likely to achieve the emission reductions and contribute to the sustainable development of the host country. LRQA therefore requests the registration of "Co-composting of Palm Oil Mill Waste at Keratong" to the CDM Executive Board as a CDM project activity.

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## Abbreviations

AWMS	Animal Waste Management System
BE	Baseline emissions
BMP	Biochemical Methane Potential
CAPEX	Capital Expenditure
CARs	Corrective action requests
CDM	Clean development mechanism
CDM-EB	Executive board of clean development mechanism
CDM M&P	Modalities and procedures for a clean development mechanism
CDM VVM	CDM Validation and Verification Manual
CERs	Certified emission reductions
CLs	Clarification requests
cm	centimetres
COD	Chemical Oxygen Demand
COP/MOP	Conference of the Parties serving as meeting of the Parties to the Kyoto Protocol
DANIDA	Danish International Development Assistance
DNA	Designated national authority
DOE	Designated operational entity
EF	Emission factor
EFB	Empty Fruit Bunches
EIA	Environmental impacts assessment
ERPA	Emissions reduction purchase agreement
FAR	Forward action requests
FFB	Fresh Fruit Bunches
GHG	Greenhouse gas
GSP	Global stakeholders' consultation process
IPCC	Intergovernmental panel on climate change
IRR	Internal rate of return
kg/l	kilograms per litre
kms	kilometres
KP	Kyoto Protocol of the United Nations Framework Convention on Climate Change
kW / kWh	Kilowatt / Kilowatt hour
LE	Leakage emissions
LoA	Letter of approval
LR	Lloyd's Register
LRQA	Lloyd's Register Quality Assurance Limited
mg/l	milligrams per litre
MW / MWh	Mega watt / Mega watt hour
NCV	Net calorific value
NGO	Non governmental organization
ODA	Official development aid
PDD	Project design document
PE	Project emissions
POME	Palm Oil Mill Effluent
PP	Project participant
RM	Malaysian Ringgits
SOP	Standard Operating Procedures
SWDS	Solid Waste Disposal Site
t/h	Tonne per hour

tCO <sub>2</sub> e	Tonnes of carbon dioxide equivalent
TJ/Gg	Tera Joules per Giga grams
UNFCCC	United Nations Framework Convention on Climate Change
VVS	Volatile Solids
WWTS	Wastewater Treatment System

## 2 Introduction

The project participant (PP) represented by Hi-Tech Activated Carbon Sdn. Bhd. has contracted with Lloyd's Register Quality Assurance Limited (LRQA) to undertake validation of the proposed project activity, "Co-composting of Palm Oil Mill Waste at Keratong". This report summarises the findings of the validation process that has been conducted on the validation requirements of the CDM.

The validation has been undertaken by the team formed of the qualified personnel of LRQA as follows:

Ketan S Deshmukh	LRQA Ltd.	Team Leader CDM Lead Validator,
Michiaki Chiba	LRQA Ltd.	Team member, CDM Lead validator
Tien-seong Ng	LRQA Kuala Lumpur	Team member, CDM validator
Gim Aik, Cheah	LRQA Kuala Lumpur	Team member, CDM validator,
Andy Cheng	External expert	Sector Expert to Validation Team
Prabodha C Acharya	LRQA Ltd., India	Technical reviewer
Sim Kean Hong	External expert	Sector Expert to Technical Reviewer
Andrew Ritchie	LRQA Ltd.	Decision Maker

Personnel being engaged in a CDM project validation are qualified based on the established procedures of LRQA to assure the resource requirements satisfy all the requirements of competence criteria for a DOE under CDM (CDM-Accreditation Standard Version 04). LRQA is designated as an operational entity and holds the full responsibility of decision-making regarding the validation, in accordance with the accreditation requirements of the CDM-EB. The certificate of appointment of the team personnel is attached to this report.

### 2.1 Objective

Validation is the process of an independent third party evaluation of a project activity on the basis of the PDD, against the requirements of the CDM as set out in Article 12 of the Kyoto Protocol, the CDM M&P, the present annex, subsequent decisions made by the COP/MOP and CDM-EB, and other rules applicable to the proposed project activity including the host country's legislation and its specific requirements for sustainable development. The validation follows the requirements of the current version of the CDM validation and verification manual (CDM VVM) to ensure the quality and consistency of the validation work and the report.

### 2.2 Scope

The scope of validation is an independent and objective review of the project design. Review of the PDD is conducted against the requirements of the Kyoto Protocol, the CDM M&P and relevant decisions of the COP/MOP and the CDM-EB. LRQA follows a risk-based approach in the validation focusing on the identification of significant risks for project implementation and generation of CERs. Validation is not meant to provide any consulting towards the PP, however, the corrective actions requests (CARs) and clarifications (CLs) might provide input for improvement of the project design. A validation conclusion shall become final subject to the decision maker's review by LRQA Ltd.

## 2.3 GHG Project Description

The project intends to reduce greenhouse gas (GHG) emissions by co-composting of empty fruit bunch (EFB) and palm oil mill effluent (POME) generated from Tee Teh Palm Oil Mill located at Keratong, Pahang. The co-composting project avoids methane gas emission from uncontrolled EFB landfill disposal and from the anaerobic treatment process of POME in retaining ponds.

The Tee Teh Palm Oil Mill in the proposed project activity has a processing capacity of 20 tonnes of fresh fruit bunches (FFB) an hour and proposes to increase to 45 tonnes of fresh fruit bunches per hour from year 2 of the crediting period. Two major waste streams originate from the FFB processing: namely Empty Fruit Bunches (EFB) and Palm Oil Mill Effluent (POME). The EFB is currently deposited at an unmanaged dump site (solid waste disposal site SWDS) near the mill, where it is left to anaerobic decomposition that consequently releases methane emissions to the atmosphere. POME is moved into retaining ponds where it oxidises anaerobically for a period up to 20 days before the effluent is allowed to be discharge into a nearby river. The treatment of EFB and POME in open ponds is a standard practice currently implemented by most palm oil mills in Malaysia. Although such practice meets the relevant regulatory requirements of the host country, it generates several environmental problems, including foul odour and free emissions of methane (a GHG gas) into the atmosphere.

In the proposed project activity, EFB will be sent to a pressing machine to remove any remaining oil from the fruits. After this, EFB will be shredded to fibres of length around 5 to 10 cm and transported to the composting plant and laid in rows. Trichoderma F1132 microbes will be added to the windrows to accelerate the composting process. Each windrow will be covered by specially designed windrow cover permeable to air to facilitate aeration. The cover also allows rainwater to run off smoothly thus preventing leaching and consequent production of waste water. The windrows will be periodically turned for aeration using a tractor fitted with mechanical turner. The composting process will take anything between 8 to 10 weeks and the end product is an organic compost.

The proposed CDM project activity envisages composting of EFB and POME at the mill site that will aerobically treat EFB and POME thus reducing free emission of methane into the atmosphere. The usage of the produced compost in palm oil plantations will reduce the application of chemical fertilizers which in turn release nitrous oxide into the atmosphere as well as causing the pollution of waterways.

The estimated GHG emission reductions are 37,170 tCO<sub>2</sub>e per annum on average, and the total ERs expected to be generated in the fixed crediting period of ten years are 371,696 tCO<sub>2</sub>e.

## 3 Methodology

### 3.1 Review of documents

The validation is performed primarily based on the review of the project design document (PDD) and the other supporting documentation.

The PDD Version 1.1 dated 11/11/2007 was initially reviewed. LRQA requested the PP to present supporting information and documents relating to the project design and such additional information and documents were also reviewed by LRQA.



Through the process of the validation, the PDD and the supporting documents of the same were evaluated to confirm the actions taken by the PP to the CARs and CLs issued by LRQA. The documents reviewed by LRQA are listed in Appendix B. LRQA reviewed the final version of the PDD version 3.5 dated 21/11/2012 to confirm that all changes agreed had been incorporated.

### 3.2 Site Visit & Follow-up interviews

A site visit and follow-up interviews with the stakeholders were conducted as detailed in the schedule as below:

Date	Location/ Address	Party Interviewed	Subjects Covered	Team Members on Site
06/12/2007	Tee Teh Palm Oil Mill, Keratong	Hi Tech Activated Carbon Sdn Bhd	Field survey	Michiaki Chiba; Tien-Seong Ng
07/12/ 2007	Hi Tech Activated Carbon Sdn Bhd office	STREC Sdn. Bhd Unique Nutrients Sdn Bhd	Documentation Review	Tien-Seong Ng
09/01/2008	Offsite	Ministry of Natural Resources and Environment  STREC Sdn. Bhd	Documentation Review	Tien-Seong Ng
24/07/2011	Teleconference	Hi Tech Activated Carbon Sdn Bhd	Follow up issues	Ketan Deshmukh; GA Cheah

A full list of persons interviewed is shown in Appendix C.

For details of all the findings of the desk review and site visit, please refer to the Validation Protocol and Findings in Appendix F.

### 3.3 Resolution of clarification and corrective action requests

LRQA applies the risk based approach aimed at focusing on high risk issues to the validation results whilst not omitting any part of the mandatory processes.

Findings identified in the process are indicated under the titles corrective action requests (CARs) and clarification requests (CLs) and forward action requests (FARs). CARs and CLs require the PP to take relevant actions. Criteria for judging items as CAR or CL are as follows:

#### **Corrective action request (CAR):**

- the project participants have made mistakes that will influence the ability of the project activity to achieve real, measurable additional emission reductions
- the CDM requirements have not been met, or
- there is a risk that emission reductions cannot be monitored or calculated.

**Clarification request (CL):**

- information is insufficient or not sufficiently clear to determine whether the applicable CDM requirements have been met.

FARs are to be raised to highlight issues related to project implementation that require review during the first verification of the project activity. FARs do not relate to CDM requirements for registration.

CARs and CLs are to be resolved or closed out if the PP modifies the project design, rectifies the PDD or provides adequate additional explanations or evidence that satisfies the concerns. If this is not completed, the project activity cannot be recommended for registration to the CDM Executive Board.

For details of the nature of the issues raised, the nature of the responses provided, the means of validation of such responses and the resulting changes in the PDD or supporting annexes please refer to the Validation Protocol and Findings in appendix F.

### 3.4 Internal quality control

A technical review by a qualified person independent from the validation team and a review by an authorised decision maker were conducted prior to the submission of the validation report to the PP and prior to requesting the registration of the project activity.

## 4 Validation protocol and conclusions

This section provides an overview of the validation activities undertaken by LRQA in order to arrive at the final validation conclusions and opinion. It includes general conclusions based on the Clean Development Mechanism Validation and Verification Manual Version 01.2. Further details in relation to each element of the protocol and each finding are shown in the Validation Protocol and Findings – Appendix F.

The protocol is structured based on the main validation requirements as follows:

- Approval by the Parties involved
- Participation requirements
- Project design document
- Project description
- Baseline and monitoring methodology
  - Applicability of the selected methodology
  - Project boundary
  - Baseline identification
  - Algorithms and/or formula used to determine emission reductions
- Additionality of a project activity
  - Prior consideration of the CDM
  - Identification of alternatives
  - Investment analysis
  - Barrier analysis
  - Common practice analysis
- Monitoring plan
- Local stakeholder consultation
- Environmental impacts.

### 4.1 Approval

A CDM project shall be approved by the Parties involved.

The host Party of the proposed project is Malaysia. Malaysia ratified the Kyoto Protocol on 04/09/2002. The Designated National Authority (DNA) is Conservation

and Environment Management Division established in the Ministry of Natural Resources and Environment (MNRE).

A letter of approval from the host Party, reference number NRE(S) 602-2/11 Jld 15 (40) dated 17/04/2012 has been received for the project.

The Annex I Party is United Kingdom of Great Britain and Northern Ireland ratified the Kyoto Protocol on 31/05/2002. Environmental Agency is the Designated National authority for the CDM. A letter of approval from the Annex I Party, reference number EA/Belektron/03/2012 dated 17/10/2012 has been received.

LRQA has validated the contents of the Letter of Approvals to confirm that it meets the requirements. For details relating to this section, please refer to the Validation Protocol in Appendix F.

CAR 01 was initially raised since the Letter of Approval from the host Party DNA was not available. This was subsequently closed on receipt of the Letter of Approval and validating its contents as described in detail in the Validation Protocol Appendix F.

CAR 02 was initially raised since the Letter of Approval from the Annex I Party DNA was not available. This was subsequently closed on receipt of the Letter of Approval and validating its contents as described in detail in the Validation Protocol Appendix F.

## 4.2 Participation requirements

Hi-Tech Activated Carbon Sdn. Bhd. is a private entity having its registered office in Malaysia.

Belektron d.o.o is a private entity having its registered office in Slovenia.

The contact details of the PPs are correctly provided in Annex 1 of the PDD.

For details relating to this section, please refer to the Validation Protocol in Appendix F.

The Modalities of Communication between PPs dated 11/09/2012 was reviewed and noted to meet the requirements specified in the Modalities of communications between project participants and the executive board (EB45 Annex 59).

## 4.3 Project design document

The PDD was checked and confirmed as complete against the "Guidelines for completing the simplified project design document (CDM-SSC-PDD) Version 05 and the form for proposed new small scale methodologies (CDM-SSC-NM) Version 03".

A valid form of the CDM-PDD is used that is the current form (for project applying VVM) as available on the CDM website.

For details relating to this section, please refer to the Validation Protocol in Appendix F.

## 4.4 Project description

The validation team confirmed the description of the pre-project scenario described in the PDD through a physical inspection of the site of EFB disposal and POME disposal. Through the site visit, the validation team confirmed that prior to the project activity; EFB was being disposed of at an open landfill near the palm oil mill while POME was collected in retaining ponds for anaerobic treatment until the quality of the effluent

meets the legislative required limit. The waste water and solid waste disposal permit issued by the Department of Environment (DoE) reference ASC31/152/000/010, effluent sample test report dated January until November 2007 was reviewed and the validation team confirmed compliance of the treated effluent to the relevant legal requirement.

The treatment of EFB and POME in open ponds is a standard practice currently implemented by most palm oil mills in Malaysia. Although such practice meets the relevant regulatory requirements of the host country, it generates several environmental problems, including foul odour and free emissions of methane (a GHG gas) into the atmosphere.

The validation team reviewed

- The project proposal received from Harcos Construction Sdn. Bhd., dated 18/05/2007
- Presentation provided by the PP during the site visit along with relevant discussions,
- written introduction to the Trichoderma F1132 as a good composting accelerator and confirmed that the project description provided in the PDD and the application of the technology is appropriate.

The project activity is located at Lot PT 324, Keratong, District of Rompin, Pahang, Malaysia. The geographical coordinates of the project activity are: 2°50' 24.3" N 102° 51' 55.6" E (2.8400833 N, 102.8654 E), as describe in Section A.4.1.4 of the PDD. CL01 was raised seeking evidence to confirm the location co-ordinates. The PP provided a Google Earth snapshot and revised the co-ordinates. LRQA confirms that the project description included in the PDD is accurate and complete including the geographical coordinates of the project activity.

This description provides the reader with a clear understanding of the precise nature of the project activity and the technical aspects of its implementation.

CAR 03 was initially raised since the current milling capacity of the Tee Teh Palm Oil Mill was noted to be 20 t/h which was not appropriately reflected in the PDD. The PP revised the PDD to reflect the current milling capacity of 20t/h and the proposed increase to 45 t/h. CAR 03 was therefore closed. Please refer to Validation Protocol in Section F of this report for details.

### **Sustainable development**

The host Party's DNA has confirmed the contribution of the project activity to the sustainable development of the host Party in the Letter of Approval dated 17/04/2012 issued to the PP.

### **Small scale CDM criteria**

The project activity aims at avoidance of methane emissions from the unmanaged disposal of EFB and POME. This project activity is classified as Type III defined within Appendix B of the simplified modalities and procedures for small-scale project activities.

In accordance with decision 17/CP.7 paragraph 6(c) revised by paragraph 28 of decision CMP 2, Type III is defined to include project activities limited to those that result in emission reductions of less than or equal to 60 ktCO<sub>2</sub> equivalent annually.

The project activity is estimated to reduce an average annual ER of 37,170 tCO<sub>2</sub>e over a 10 year fixed crediting period. The annual emission reduction varies based on the decomposition of the waste; however, the emission reductions do not exceed the

small scale limit of 60,000 tCO<sub>2</sub>e in any of the years of the crediting period and therefore the project activity is classified as a small scale CDM project activity. The validation team confirms that the project activity will remain within the limit specified for a Type III project during each year of the crediting period.

For details relating to this section, please refer to the Validation Protocol in Appendix F.

The validation team also confirmed that this is the only project activity by the PP by reviewing registered and under validation project activities on the UNFCCC website and therefore the validation team confirms that the project activity is not a debundled project activity of a large-scale project activity.

## 4.5 Baseline and monitoring methodology

### **Applicability of the selected methodology to the project activity**

The project activity applied AMS-III.F. as the approved baseline and monitoring methodology to the project activity. Although Version 04 of this methodology was initially applied, the PP revised this subsequently owing to revisions to the methodology and version 10 of the methodology has been currently applied. The validation team confirms that AMS-III.F is valid for seeking registration until 25/01/2013 23:59:59GMT.

LRQA confirms that the selected methodology is applicable to this project activity based on the project's applicability against each condition in the approved methodology. Appendix F includes the list of each applicability condition, the steps taken to validate each one and the conclusions about its applicability to the proposed project activity.

For details relating to this section, please refer to the Validation Protocol in Appendix F.

CAR 04 was initially raised because the PDD reflected application of AMS-III.F. Version 04 whilst the UNFCCC webpage showed AMS-III.F. Version 05. The PP applied the AMS-III.F. Version 10 which is valid for seeking registration until 25/01/2013 and therefore this CAR 04 was closed out.

### **Project boundary**

The project boundary has been validated through documentation review of the consultancy proposal, interview and field survey that included the location of the palm oil mill plant, the disposal site of EFBs and POME and the site of the project activity. This information was substantiated via cross-check with the permit sought from the Department of Environment, the effluent test reports from the palm oil plant, etc. Through the processes undertaken, the validation team confirmed that the identified project boundary, the selected sources and the gases were justified for the project activity and they meet the requirements of the approved methodology.

For details relating to this section, please refer to the Validation Protocol in Appendix F.

### **Baseline identification**

The baseline scenario identified in the PDD has been assessed against the requirements in the approved methodology. LRQA can confirm that the procedure included in this methodology to identify the most reasonable baseline scenario, has been correctly applied.

The steps taken to assess the baseline identification are described in the Validation

protocol in Appendix F.

LRQA confirms that:

- All the assumptions and data used by the project participants are listed in the PDD, including their references and sources;
- All documentation used is relevant for establishing the baseline scenario and correctly quoted and interpreted in the PDD;
- Assumptions and data used in the identification of the baseline scenario are justified appropriately, supported by evidence and can be deemed reasonable;
- Relevant national and/or sectoral policies and circumstances are considered and listed in the PDD;
- The approved baseline methodology has been correctly applied to identify the most reasonable baseline scenario and the identified baseline scenario reasonably represents what would occur in the absence of the proposed CDM project activity.

#### **Algorithms and/or formula used to determine emission reductions**

LRQA has confirmed that the steps taken and the equations applied to calculate project emissions, leakage baseline emissions and emission reductions comply with the requirements of the approved methodology

The steps taken to assess the algorithms and/or formula used to determine emission reductions are described in the Validation protocol in Appendix F.

LRQA confirms that:

- All assumptions and data used by the project participants are listed in the PDD, including their references and sources;
- All documentation used by project participants as the basis for assumptions and source of data is correctly quoted and interpreted in the PDD;
- All values used in the PDD are considered reasonable in the context of the proposed CDM project activity;
- The baseline methodology has been applied correctly to calculate project emissions, baseline emissions, leakage and emission reductions;
- All estimates of the baseline emissions can be replicated using the data and parameter values provided in the PDD.

CAR 05 was initially raised since all the parameters required for baseline and monitoring were not available in the PDD. The PP revised the PDD to reflect all relevant parameters. The validation team confirmed the appropriateness of the data parameters and closed CAR 05.

## **4.6 Additionality of a project activity**

The project additionality was demonstrated by the PP using attachment A to Appendix B of the simplified modalities and procedures for small-scale.

#### **Prior consideration of CDM**

The project activity starting date was before 02/08/2008. The processes required in Guidance on the demonstration and assessments of prior consideration of the CDM, Annex 13 to EB62, have been taken.

The start date of the project activity is determined as 13/11/2007 which is the date on which a letter of award was issued to a contractor for construction of composting plant. This complies with the definition of Start date defined in Glossary of CDM Terms. The start date is prior to 02/08/2008 and prior to the date of publication of the PDD for global stakeholder consultation (which was on 01/12/2007); therefore the validation team assessed the serious CDM decision making process adopted by the PP for the project activity. The minutes of the board decision dated 08/05/2007 wherein the board decided to investigate the feasibility of applying CDM to the project activity and a



subsequent board decision dated 20/05/2007 wherein the board decided that the project is not feasible without the support of CDM funds were reviewed by the validation team. The validation team confirmed the authenticity of the board decisions through the certified copies of the board decisions by the company secretary. In addition, the validation team interviewed Mr. M. C. Wong, a member of the Board on Hi-Tech Activated Carbon Sdn. Bhd. and confirmed the serious consideration of CDM during the decision making process.

Further, the appointment of the consultant and the availability of the PDD onto the UNFCCC website for global stakeholder consultation process on 01/12/2007 and continued interaction with the DNA of the host country confirmed that the PP had undertaken continued and real actions to secure the CDM status of the project activity.

The steps taken to assess the prior serious consideration of the CDM are described in the Validation protocol in Appendix F.

CAR 06 was initially issued since the start date mentioned in PDD Version 1.1 was 01/12/2008. However, during the site visit, it was noted that the contract to construction company, Harcos Constructions Sdn. Bhd. was issued on 13/11/2007. The PP revised the start date of the project activity to reflect 13/11/2007 and therefore CAR 06 was closed out.

#### **Identification of alternatives**

The list in the Validation Protocol – Appendix F section 6.b, shows the alternatives given in the PDD, and clearly states how LRQA has validated whether these alternatives are credible and complete.

It is the opinion of LRQA that the list of alternatives provided in the PDD are credible and complete considering the technology and circumstances of the proposed Project activity as well as the investor's business.

#### **Investment analysis**

The investment analysis option has been used to demonstrate the additionality of the proposed project activity. LRQA confirms that the PDD provides justification that this project activity would not be economically or financially feasible without the revenue from the sale of CERs.

The PPs have shown that the project activity is additional by demonstrating that the returns from the proposed CDM project activity are less than the established returns for the palm oil sector.

For assessing the additionality of this project activity LRQA has complied with the latest version of the "Guidance on the Assessment of Investment Analysis" as provided by the CDM Executive Board.

For details about the validation of the parameters used in the financial calculations and assessment of the benchmark applied, please refer to the Validation protocol in Appendix F.

CAR 07 was issued since the evidence to support equipment costs was not available. Also, the period of assessment was considered to be only 5 years, although, the lifetime of the project activity was 20 years. The PP supplied the evidence to support equipment costs and revised the spreadsheet to reflect a 20 year period of assessment. The validation team reviewed the responses received and confirmed that it correctly addresses the issue raised. CAR 07 was therefore closed.

LRQA confirms that the underlying assumptions for the investment analysis are appropriate and that the financial calculations are correct.

#### **Barrier analysis**

The PP had applied technological barrier to demonstrate additionality of the project activity. LRQA raised CAR 09 asking the PP to justify the barrier using the Guidelines on Objective Demonstration of Barriers, EB50 Annex 13. PP withdrew the contents of the technological barrier from the PDD and the validation team closed CAR 09.

For details about the validation of the barrier analysis, please refer to the Validation protocol in Appendix F.

### **4.7 Monitoring Plan**

The PDD includes a Monitoring Plan based on the approved monitoring methodology AMS-IIIF Version 10.

LRQA confirms that the Monitoring Plan described in the PDD complies with the requirements in the Monitoring Methodology and that the PPs will be able to apply this Monitoring Plan following the monitoring arrangements described in it.

For details about the validation of the Monitoring Plan, please refer to the Validation protocol in Appendix F

### **4.8 Local stakeholder consultation**

The PPs invited Local Stakeholders to comment on the proposed project activity on 22 October 2007 prior to the publication of the PDD on the UNFCCC website. The local stakeholder consultation meeting was held in the premises of Tee Teh Palm Oil Mill and the following persons and entities attended this meeting. Rompin District Office, Rompin District Department of Environment, residents, nearest Palm Oil Mill employee and manager.

<b>Invited Stakeholders</b>	<b>Representatives</b>
Local Residents	8
Mill Management and Staff	9
Consultants	2
<b>Total</b>	<b>19</b>

LRQA confirms that the stakeholder consultation process targeted stakeholders and was appropriate for identifying stakeholders' opinions about the project and collecting their views.

For details about the steps taken to assess the adequacy of the Stakeholder consultation, please refer to the Validation protocol in Appendix F

CAR 08 was initially raised since the PDD did not address as to how due account was taken of the comments raised. The PP revised the PDD to include the process adopted and that there was no objection to the project activity. The validation team confirmed from the minutes of the stakeholder consultation undertaken with regard to the queries raised by stakeholders and the responses by the PP and concluded that the PDD reflects the process of stakeholder consultation. CAR 08 was therefore closed.

### **4.9 Environmental impacts**

LRQA has confirmed that the project activity does not require any EIA based on local environmental quality (prescribed activities) (Environmental Impact Assessment) order 1987.

For details, please refer to the Validation protocol in Appendix F.



#### 4.10 Summary of Changes

Significant changes made to the original PDD published for Global Stakeholder Consultation Process are summarised below. The PDD Version 1.1 dated 11/11/2007 was modified and several changes occurred as a result of validation process. The PDD Version 3.5 dated 21/11/2012 includes all these changes.

For details about the results of the responses to CARs and CLs, discussions on revisions to project documentation and the detailed changes to the PDD coming from the validation process, please refer to the Validation Findings Log in the Validation Protocol in Appendix F.

1. Change in the version number of the methodology. AMS-III.F Version 04 was initially applied at the time the PDD was made available for GSP PDD. The applied methodology AMS-III.F version 10 applied for the project activity is valid for seeking registration until 25/01/2013.
2. Project description clearly mentions that the current capacity of the palm oil mill is to process 20 t/h FFB and that the palm oil mill intends to expand their capacity to process 45 t/h of FFB
3. The average annual Emission Reductions in the original web-hosted PDD were 50,645 tCO<sub>2</sub>e. This is now revised to 37,170 tCO<sub>2</sub>e per annum and has been a result of changes to the calculation methodology of emission reduction estimation as per applied methodology AMS-III.F version 10.
4. The investment analysis was applied over a period of 5 years although the crediting period was ten years. Subsequently, the investment analysis was carried out for 20 years as that reflects the life of the project activity.
5. Coverage of all data parameters related to baseline and monitoring that were missed out in the initial submission of the PDD.
6. A discussion on how comments from stakeholder consultation were received and how due account was taken of the comments.

## 5 Comments by parties, stakeholders and NGOs

In accordance with the requirement of the Procedures for Processing and Reporting on Validation of CDM project activities, the PDD is to be made publicly available for 30 days subject to confidentiality provisions agreed with the PP, to enable comments to be received from Parties, stakeholders and UNFCCC accredited NGOs on the validation and registration requirements.

The PDD was made publicly available in accordance with the requirements of the procedure for the period of 01/12/2007 to 30/12/2007 at the following link:

<http://cdm.unfccc.int/Projects/Validation/DB/CBU67UCY52SSIK88F86BUF7OPSG609/view.html>

No comment was received during this period.

## 6 Validation Opinion

LRQA has undertaken the validation of the proposed project activity “Co-composting of Palm Oil Mill Waste at Keratong” based on the requirements of CDM as set out in Article 12 of the Kyoto Protocol, the CDM M&P, the present annex, subsequent decisions made by the COP/MOP and CDM-EB, and the other rules applicable to the proposed project activity including the host country’s legislation and its specific requirements for sustainable development.

The project intends to reduce greenhouse gas (GHG) emissions by co-composting of empty fruit bunch (EFB) and palm oil mill effluent (POME) generated from Tee Teh Palm Oil Mill located at Keratong, Pahang. The co-composting project avoids methane gas emission from open air uncontrolled EFB landfill disposal and from open air effluent anaerobic treatment process.

In order to arrive at the final validation conclusions and opinion, LRQA carried out document review of the project design and other related documents, undertook a site visit and interviewed key personnel, including a general discussion of details captured by the validation protocol and conclusions related to CDM requirements. There was no project component or issues excluded from the validation.

Through the validation process, the validation team identified 9 CARs and 1 CL. The PP has taken action on the issues raised and submitted to LRQA the revised PDD and other supporting evidence.

- The PP has correctly applied the approved methodology, AMS-III. F., “Avoidance of methane emissions through controlled biological treatment of biomass” Version 10 to the project activity that involves avoidance of methane emission from landfill site and anaerobic treatment of POME at open lagoon by co-composting of EFB and POME.
- The PP was aware of CDM prior to the project start, benefits of CDM were seriously considered at the time of the investment decision and that continued and real actions were taken by the PP to secure the CDM status of the project activity. This has been validated on the basis of documentary evidence and interviews.
- The validation confirmed that the financial returns of the proposed project activity would be insufficient to justify the required investment and hence the project activity is additional.
- The monitoring plan has been suitably addressed and the implementation of the plan by the PP is feasible within the project design.
- There are no significant environmental impacts arising from the project activity implementation.
- The local stakeholder process was held in a clear and transparent manner and no negative comments were expressed. No comments were received during the global stakeholder process.

The validation team is of the opinion that the proposed project activity conforms to all the relevant UNFCCC requirements for the CDM as well as the host country's national requirements, and if implemented as designed, is likely to achieve the validated annual average emission reductions of 37,170 tCO<sub>2e</sub> and contribute to the sustainable development of the host country. Therefore LRQA requests the registration of "Co-composting of Palm Oil Mill Waste at Keratong" to the CDM Executive Board as a CDM project activity.

**Decision Maker**



Andrew Ritchie  
Climate Change Services Manager  
27<sup>th</sup> November 2012

## 7 Appendices

### 7.1 Appendix A: Letter of approval for the project by the host and investing country DNA

Letter of Approval from Malaysia, Reference no. NRE(S)602-2/11 Jld 15 (40) dated 17/04/2012

Letter of Approval from United Kingdom of Great Britain and Northern Ireland, Reference no. EA/Belektron/03/2012 dated 17/10/2012

### 7.2 Appendix B: List of documents reviewed

#### **Category A documents (documents prepared by the PP)**

1. PDD Version 1.1 dated 11/11/2007; PDD Version 2.0 dated 9/9/2010; PDD version 3.0 dated 20/01/2012; Version 3.3 dated 06/08/2012, Version 3.4 dated 30/08/2012; Version 3.5 dated 21/11/2012
2. Worksheet contain Emission Reduction, IRR calculation and sensitivity analysis dated 9/9/2010; version 3.0 dated 20/01/2012; Version 3.3 dated 06/08/2012, Version 3.4 dated 30/08/2012
3. Department of Environment permit to proposed co-composting project dated December 2006
4. Consultancy, installation, operation and maintenance proposal to co-composting system dated 18/05/2007.
5. Quotation of Supply Microbe by Unique Nutrients Sdn Bhd dated November 2007
6. Agreement for Leasing of Land, Purchasing of EFB and Selling of Compost Fertiliser between Hi-Tech Activated Carbon Sdn Bhd and Tee Teh Sdn Bhd dated October 2007
7. Palm Oil Mill Daily Production Report dated January 2005 to December 2006
8. Daily Effluent Discharge Report dated January 2007 to November 2007.
9. Palm Oil Mill Effluent Test Report dated January to November 2007
10. Fertiliser Invoice to Tee Teh Plantation dated October 2005 to July 2007
11. Letter of Invitation to Public Consultation Seminar attention to Rompin District Department of Environment dated October 2007.
12. Letter of Invitation to Public Consultation Seminar attention to Rompin District Office dated October 2007.
13. Utusan Malaysia advertisement inviting public to attend the Public Consultation Seminar dated October 2007.
14. Early CDM start Minutes of board meeting in 08/05/2007
15. Certified minutes (by the Company Secretary) of the board meeting held on 20/05/2007
16. Agreement for transfer of ownership of composting facility between Hi-Tech Activated Carbon Sdn Bhd and Tee Teh Palm Oil Mill dated 11/11/2007
17. DNA invitation letter for CDM project presentation on 03/04/2008
18. LoA conditional approval from DNA on 18/04/2008
19. Approval of extension to submit CDM validation draft report by DNA on 18/02/2010
20. CDM consultancy agreement and termination letter between STREC and Hi-Tech Activated Carbon Sdn Bhd dated 11/11/2007 and 23/09/2009
21. CDM consultancy agreement between YTL-SV Carbon Sdn Bhd and Hi-Tech Activated Carbon Sdn Bhd dated 15/10/2009
22. Letter of confirmation that the mill capacity expansion plan to 45 tonnes/hr dated 14/10/2007
23. Term agreement between Hi-Tech Activated Carbon Sdn Bhd and Pathgreen dated 25/06/2009

24. Quotation for construction of composting plant at Tee The Palm Oil Mill (Keratong) dated 12/11/2007
25. Construction of Composting Plant Letter of Award dated 13/11/2007
26. Invoice of drum truck lorry dated 03/03/2007
27. Tractor quotation dated 13/12/2006
28. 2007 to 2009 FFB and POME generation record
29. 2009 October COD test record
30. Quotation for monitoring equipment dated April 2010
31. Thermometer invoice dated 28/06/2007
32. Tee Teh Plantation confirmation of electricity supply from the mill dated 12/04/2010
33. Agreement purchase of EFB in Phase II dated 30/11/2007
34. Engineering drawing of anaerobic lagoon dated 21/06/2012 by Professional Engineer A. K. Ong and certified by Department of Environment.
35. Department of Environment approval on processing capacity for Tee Teh Palm Oil Mill dated 03/07/2012
36. Modalities of Communication between project participants dated 11/09/2012.

**Category B documents (other documents referenced)**

1. Simplified Modalities and Procedures for Small Scale CDM Project Activities
2. Guidelines for completing the simplified project design document, Version 05
3. Project Design Document Form (CDM-SSC-PDD), Version 03
4. AMS IIIF Versions 04, 05, 08, 10 – Avoidance of methane emissions through composting
5. AMS-III.H Version 16 – Methane Recovery in Wastewater treatment
6. Tool to determine methane emissions avoided from dumping waste at a solid waste disposal site” Version 04 adopted by EB 41
7. Tool to calculate project or leakage CO<sub>2</sub> emissions from fossil fuel combustion / Version 02
8. Tool for the demonstration and assessment of additionality, Version 04
9. Guidelines on the Assessment of Investment Analysis, Version 05
10. Guidelines for objective demonstration and assessment of barriers (Annex13 to EB50)
11. Indicative simplified baseline and monitoring methodologies for selected small-scale CDM project activity categories (Annex21 to EB61)
12. Non-binding best practice examples to demonstrate additionality for SSC project activities (Annex 34 to EB35)
13. Glossary of CDM terms Version 05 and Version 06
14. Validation and Verification Protocol, Version 01.2
15. Chow Mee Chin, “An Assessment of potential and availability of palm biomass for bioconversion to bioethanol”.
16. Lim, KC and Zaharah, A R ‘*Decomposition and N & K release by Oil Palm Empty Fruit Bunches Applied under Mature Palms*’, *Journal of Oil Palm Research Vol. 12 No.2, December 2000*
17. Karan Capoor, Philippe Ambrosi “State and Trends of the Carbon Market 2008”, The World Bank, Washington, May 2008.
18. DANIDA “Study on Clean Development Mechanism Potential in the Waste Sectors in Malaysia”, December 2004
19. Masjuki Hj Hassan, Mohd Rehan Karim, T.M. Indra Mahlia “Energy use in the transportation sector of Malaysia”, UPUM, May 2005
20. TEOH, C.H. (2002). “THE PALM OIL INDUSTRY IN MALAYSIA: From Seed to Frying Pan”, WWF
21. Wahid Mohd Basri, Chan Kook Weng, Choo Yuen May, Chow Mee Chin (2006). The need to reduce national greenhouse gases emissions: oil palm industry’s role. *Journal of oil palm research*, April 2006

22. Yusoff, S. (2006) Renewable energy from palm oil – innovation on effective utilization of waste. Journal of cleaner production 14 (2006) – accessible from “<http://www.scribd.com/doc/8115684/Renewable-Energy-From-Palm-Oil>”
23. Economic Planning Unit, (2004). The Malaysian Economic in Figures, Economic Planning Unit, Prime Minister’s Department, Putrajaya, Malaysia
24. Department of Environment, (2002), “Urban Air Quality Management: Motor Vehicle Emission Control in Malaysia”
25. N Ravi Menon; Zulkifli, Ab Rahman\* and Nasrin Abu Bakar “EFB Evaluation – mulching in plantation vs fuel for electricity generation”, Oil Palm Industry Economic Journal Vol 3 (2) 2003
26. Frank Schuchardt et al, “Effect of new palm oil mill process on the EFB and POME utilisation”, Journal of Oil Palm Research (Special Issue –October 2008), pg 115-126
27. Yusof Basiron et al “Oil Palm: the agricultural producer of food, fiber and fuel for global economy”, oil palm industry economic journal (volume (6)1), 2006.

### 7.3 Appendix C: List of persons interviewed

Hi Tech Activated Carbon Sdn. Bhd.

Mr M C. Wong - Director

STREC Sdn. Bhd.

Mr Chow Kok Kee – Consultant (Deceased)

Unique Nutrients Sdn. Bhd.

Mr CH Kwek - Director

Ministry of Natural Resources and Environment

Dr Lian Kok Fe - Under secretary, Conservation and Environment Management Division

En Shahril Faizal Abdul Jani - Principal Assistant Secretary, Conservation and Environment Management Division

### 7.4 Appendix D: How due account has been taken to the public input made to the validation requirements

The PDD was made publicly available in accordance with the requirements of the Procedures for processing and reporting on validation of a CDM project activity for the period of 01/12/2007 to 30/12/2007 as per the web link below:

<http://cdm.unfccc.int/Projects/Validation/DB/CBU67UCY52SSIK88F86BUF7OPSG609/view.html>

No comment was received during this period.

## 7.5 Appendix E: Certificate of Appointment

### Validation of “Co-composting of Palm Oil Mill Waste at Keratong”

We hereby certify that the following personnel have engaged in the validation process that has fully satisfied the competence requirements of the validation of the CDM project activity.

Name of Person	Assigned Roles
Ketan Deshmukh	Team Leader
Michiaki Chiba	Team Member
Tien-Seong Ng	Team Member
Gim Aik, Cheah	Team Member
Andy Cheng	Sector Expert
Prabodha C Acharya	Technical Reviewer
Sim Kean Hong	Sector Expert
Andrew Ritchie	Decision Maker

Signed by

**Decision Maker**



Andrew Ritchie  
Climate Change Services Manager  
27<sup>th</sup> November 2012



## 7.6 Appendix F: Validation Protocol and findings log

	Validated situation	Conclusion
<b>SECTION 1. Approval</b>		
<b>Host Country Approval</b>		
1. Has the Host country DNA provided a written approval?	Yes <input checked="" type="checkbox"/> No <input type="checkbox"/> NA <input type="checkbox"/> <sup>1</sup>  A Letter of Approval from the Environment Management & Climate-change division of the Ministry of Natural Resources and Environment dated 17/04/2012 was made available.	<del>CAR-01</del> Closed OK
2. Confirm that the letter has been issued by the Party's DNA and is valid for the proposed CDM project activity under validation	Yes <input checked="" type="checkbox"/> No <input type="checkbox"/> NA <input type="checkbox"/> The Letter of Approval has been issued by the Ministry of Natural Resources and Environment which is the DNA listed at the following website. <a href="http://cdm.unfccc.int/DNA/index.html">http://cdm.unfccc.int/DNA/index.html</a>	OK
3. Mention the means of validation employed to assess the authenticity of the Letter of Approval. Indicate the source of the LoA (for example, PP or directly from the DNA)	The LoA was made available by the PP. The validation team has confirmed the authenticity of the LoA by comparing it with the original copy of the LoA. The LoA was also compared with other similar host country approval cases issued by the DNA. Thus the team confirmed the authenticity of the letter issued.	OK

<sup>1</sup>For each section and question where a YES/NO/NA answer is required, explain your choice.

	Validated situation	Conclusion
4. Does the written Letter of Approval confirm the following: (a) The Party is a Party to the Kyoto Protocol (including ratification)? (b) Participation is voluntary? (c) The proposed CDM project activity contributes to the sustainable development of the country? (d) It refers to the precise proposed CDM project activity title in the PDD being submitted for registration?	Yes <input checked="" type="checkbox"/> No <input type="checkbox"/> NA <input type="checkbox"/> The LoA confirms: (a) The host country Party ratified the Kyoto Protocol on 04/09/2002. (b) The participation is voluntary. (c) The proposed project activity will assist the host country in achieving sustainable development. (d) The LoA indicates the precise title of the proposed project activity as indicated in the PDD.	OK
5. Is the letter of approval unconditional with respect of (a) to (d) above?	Yes <input checked="" type="checkbox"/> No <input type="checkbox"/> NA <input type="checkbox"/>	OK
6. Does the LoA from the host party acknowledge the bundle activity (if applicable)?	Yes <input type="checkbox"/> No <input type="checkbox"/> NA <input checked="" type="checkbox"/>	NA
<b>Annex I Party Approval</b>		
7. Has the Annex I country DNA provided a written approval?	Yes <input checked="" type="checkbox"/> No <input type="checkbox"/> NA <input type="checkbox"/> A Letter of Approval from Environment Agency dated 17/10/2012 was received.	<del>CAR 02</del> Closed OK
8. Confirm that the letter has been issued by the Party's DNA and is valid for the proposed CDM project activity under validation.	Yes <input checked="" type="checkbox"/> No <input type="checkbox"/> NA <input type="checkbox"/> The validation team confirmed that Environment Agency is the DNA of United Kingdom of Great Britain and Northern Ireland.	OK
9. Mention the means of validation employed to assess the authenticity of the Letter of Approval. Indicate the source of the LoA (for example, PP or directly from the DNA).	LRQA requested the UK DNA through an email correspondence to confirm the authenticity of the LoA. A written email response has been received from the UK DNA that confirms the authenticity of the LoA issued.	OK
10. Does the written Letter of Approval confirm the following: (e) The Party is a Party to the Kyoto Protocol (including ratification)?	Yes <input checked="" type="checkbox"/> No <input type="checkbox"/> NA <input type="checkbox"/> The Letter of Approval confirms the following: (a) The Annex I Party ratified the Kyoto Protocol on 31 <sup>st</sup> May 2002. (b) The participation is voluntary.	OK

	Validated situation	Conclusion
(f) Participation is voluntary? (g) It refers to the precise proposed CDM project activity title in the PDD being submitted for registration?	(c) The LoA indicates the precise title of the proposed project activity as indicated in the PDD.	
11. Is the letter of approval unconditional with respect of (a) to (c) above?	Yes <input checked="" type="checkbox"/> No <input type="checkbox"/> NA <input type="checkbox"/>	OK
<b>Host Country and Annex I Party Approval</b>		
12. Do any of the Letters of Approval contain additional specification of the project activity? Like: <ul style="list-style-type: none"> <li>- PDD Version number?</li> <li>- Validation report version number?</li> </ul> Make sure that the request for registration is made on the basis of the documents specified in any of the letters.	The LoAs do not contain PDD Version number and Validation Report Version number.	OK

		Validated situation		Conclusion
SECTION 2. Participation				
1	Confirm that the PPs are listed in a tabular form in section A.3 of PDD and that this information is consistent with the contact details provided in Annex 1 of the PDD and with the contact details in the MoC.	Host Party PP name in PDD/ A.3	Hi-Tech Activated Carbon Sdn. Bhd.	<del>CAR-02</del> Closed OK
		Host Party PP name in PDD/ Annex 1	Hi-Tech Activated Carbon Sdn. Bhd.	
		Host Party PP name in MoC	Hi-Tech Activated Carbon Sdn. Bhd.	
		Annex 1 Party PP name in PDD/ A.3	Belektron d.o.o	
		Annex 1 Party PP name in PDD/ Annex 1	Belektron d.o.o	
		Annex 1 Party PP name in MoC	Belektron d.o.o	
2	Confirm that each of the PPs has been approved by at least one Party involved.	Yes <input checked="" type="checkbox"/> No <input type="checkbox"/> NA <input type="checkbox"/>		<del>CAR-01</del> <del>CAR-02</del> Closed OK
3	Confirm that no entities other than those approved as PPs are included in section A.3 of PDD.	Yes <input checked="" type="checkbox"/> No <input type="checkbox"/> NA <input type="checkbox"/>		OK
4	Ensure that the approval of participation has been issued from the relevant DNA. If in doubt verify this with the corresponding DNA.	The validation team confirms that the approval of participation has been issued from the relevant DNAs of host party, Malaysia and Annex I Party, UK.		OK

	Validated situation	Conclusion
<p>5 Has the MoC been completed as per the latest "Procedures for MoC between the project participants and the Executive Board"?</p> <ul style="list-style-type: none"> <li>- No modifications to the template/form should be made and each document should be clearly dated</li> <li>- Title of the project and names of project participants and focal points should be fully consistent with those indicated in all other project documentation</li> <li>- Focal point scopes should be clearly and correctly indicated</li> <li>- Contact details and specimen signatures of focal point entities including those of project participants in Annex 1 should be correctly entered. Only one telephone, fax, email contact should be entered per authorized signatory. In cases where additional contact details are included, only the first indicated information will be taken into account and only the official business address of the proposed entity should be provided on the F-CDM-MOC form.</li> <li>- The Statement of Agreement in Section 3 should be signed by one authorized signatory for each project participant; signatures made available in Section 3 should correspond to those indicated in the related Annex 1 document; focal point entities who are not designated as project participants should not sign Section 3.</li> </ul>	<p>Yes <input checked="" type="checkbox"/> No <input type="checkbox"/> NA <input type="checkbox"/></p> <p>MoC dated 11/09/2012 on version 1.4 of template issued by the UNFCCC was provided by the PP. The validation team confirmed the following:</p> <ol style="list-style-type: none"> <li>1. The template, version 1.4 is valid and clearly dated</li> <li>2. Title of the project and the names of the PPs and focal points are fully consistent with those indicated in all project documentation.</li> <li>3. Focal point scope is clearly and correctly indicated.</li> <li>4. Contact details of focal points have been clearly and correctly indicated.</li> <li>5. The Statement of Agreements in section 3 is signed by one authorised signatory for each project participant.</li> </ol>	<p>CAR-02 Closed OK</p>

	Validated Situation	Conclusion
<b>SECTION 3. Project design document</b>		
1. Is the project activity Small Scale or Normal Scale?	Normal Scale <input type="checkbox"/> Small Scale <input checked="" type="checkbox"/> Bundled Small Scale <input type="checkbox"/> (cross as appropriate)	OK
2. Has the PDD used the latest template and guidance from the CDM Executive Board available on the UNFCCC CDM Website? Check outputs from the completeness check.	Yes <input checked="" type="checkbox"/> No <input type="checkbox"/> Guideline for completing the simplified project design document (CDM-SSC-PDD) Version 05 (EB34, Annex 9 and template of CDM-SSC-PDD Version 03 (EB28, Annex 34), which are the current versions available in UNFCCC website (VVM track) are used.	OK

	Validated situation	Conclusion
<b>SECTION 4. Project description</b>		
1. Describe the process undertaken to validate that the description of the proposed CDM project activity as contained in the PDD sufficiently covers all relevant elements, is accurate and that it provides the reader with a clear understanding of the nature of the proposed CDM project activity.	<p>The validation team confirmed the description of the pre-project scenario described in the PDD through a physical inspection of the site of EFB and POME disposal. EFB is disposed of at an open landfill near the palm oil mill or at the estate (palm oil plantations). POME is collected in retaining ponds for anaerobic treatment until the quality of the effluent meets the legislative required limit.</p> <p>The waste water and solid waste disposal permit issued by the Department of Environment (DoE) reference ASC31/152/000/010, effluent sample test report dated January until November 2007 was reviewed and the validation team confirmed compliance of the treated effluent..</p>	OK
2. Confirm that the exact project location is provided in the PDD with Geographical coordinates and check the accuracy of them. Please include here the Geographical coordinates:	<p>The coordinates of the project location are 2° 52' 33" N i.e. in decimal format – 2.875833 N 102° 43' 16" E, i.e. in decimal format 102.7211 E.</p> <p>The validation team used a Garmin Mobile XT GPS program and confirmed the co-ordinates as above during the site visit.</p>	OK
3. Confirm that the physical site inspection reflects the description in the PDD of the proposed CDM project activity.	<p>Project flow such as shredding of EFB, windrow setting, turning of windrow, coverage by designated windrow cover to avoid rain water run off while allow air permeation, composting process and timing, use of POME as moisture conditioner, use of composting microbe Trichoderma F1132 as accelerator was explained by PP during site visit on 6 December 2007.</p> <p>CAR 03 was initially raised since the milling capacity was described as 45 tonnes FFB/hour. However, during the site visit, it was learnt that the current capacity was 20 tonnes FFB/hour and that the plant envisaged it to be expanded to 45 tonnes FFB/hour. PP revised the PDD to reflect the current and the intended increase in capacity and therefore the CAR was removed.</p>	<del>CAR 03</del> Closed OK

	Validated situation	Conclusion
	<p>Through local sectoral expertise and literature reviews, the validation team confirmed that it is common practice in Malaysian for palm oil mills to dispose of EFB in unmanaged dump sites since incineration is prohibited and other means of disposal are too expensive.</p> <p>Literature review: “An assessment of potential and availability of palm biomass for bioconversion to bioethanol”, a report prepared under the Malaysian - Danish Environmental Cooperation Programme Renewable Energy and Energy Efficiency Component by Chow Mee Chin was reviewed.</p> <p>POME generator is required to submit effluent quality report to local Department of Environment office. The validation team reviewed the monthly submissions of effluent discharge to the Department of Environment Office and confirmed that such submissions are being done and that it is in compliance with the limit on COD discharge of 100 mg/l. Further, the team also confirmed that there is no new requirement of any specific treatment of the EFB or POME for new or expansion of existing facilities other than meeting the discharge limit specified.</p> <p>The purpose of the project activity is to reduce EFB waste load, reduce POME load, co-compost to fertiliser which could be applied at nearby palm oil estate, and avoid methane gas emission from the decay of EFB and POME emission. Sustainable Development contribution via replacement of imported chemical fertiliser, reduce dependence of imported fertiliser, increase local job opportunity and improve living environment – less odour from EFB dumping area and POME lagoon.</p> <p>GHG emission reduction from avoidance of EFB open dumping, avoidance of POME at the lagoon is clearly documented. Both EFB and POME is co-composted with addition of Trichoderma F1132 microbes to accelerate the co-composting process. The introduction of Trichoderma F1132 which includes the application at co-composting is available from the PP provided material, “Consultancy, installation, operation and maintenance proposal to co composting system”</p> <p>The validation team reviewed the project proposal presented by Harcos</p>	



	Validated situation		Conclusion
	Construction Sdn Bhd dated 18 May 2007 and confirmed the relevance of the project description and the sound application of the technology.		
<p>4. If the team did not undertake a physical site inspection, describe the justification as approved by the CDM Quality Manager. (VVM 01.2: 60-61)</p> <p>Describe briefly the physical site inspection: Travel details and installations, facilities and buildings visited.</p>	<p>Not Applicable since a site visit was undertaken.</p> <p>The site visit included the following:</p> <ol style="list-style-type: none"> <li>1. Tee Teh Palm Oil Mill to determine the capacity of processing Fresh Fruit bunches, the current practice of disposal of the Empty Fruit bunches, monitoring records of effluent and legal compliance.</li> <li>2. High Tech Activated Carbon Sdn &amp; STREC Sdn Bhd – Discussions with respect of Project Description, Methodology, Additionality, Environmental Impacts, Stakeholder consultation</li> <li>3. Unique Nutrients Sdn Bhd – Discussions with respect of Trichoderma F1132 technology</li> <li>4. Ministry of Natural Resources and Environment – Environmental Impacts</li> </ol>		OK
<p>5. If the proposed CDM project activity involves the alteration of an existing installation or process, ensure that the project description clearly states the differences resulting from the project activity compared to the pre-project situation.</p>	<p>Pre-project</p> <p>EFB – in pre-project scenario, this is deposited in unmanaged dump sites where it is left to decompose under anaerobic condition and releases methane emissions to atmosphere.</p> <p>POME - moved into retaining ponds where it oxidises anaerobically before the effluent is allowed to be discharged into nearby river. Although, the discharged effluents meet the relevant regulatory requirements, the practice generates several environmental problems, including foul odour and free emissions of methane (a GHG gas) into the atmosphere.</p>	<p>Project activity</p> <p>The composting facility is expected to treat both EFB and POME aerobically thus reducing free emission of methane into atmosphere.</p> <p>EFB will be sent to a pressing machine to remove any remaining oil from the fruits. After this EFB will be shredded to fibres of length around 5 to 10 cm and transported to the composting plant and laid in rows. Trichoderma F1132 microbes will be added to the windrows to accelerate the composting process. Each windrow will be covered by specially designed windrow cover permeable to air to facilitate aeration. The cover also allows rainwater to run</p>	OK

		Validated situation	Conclusion
		off smoothly thus preventing leaching and consequent production of waste water. The windrows will be periodically turned for aeration using a tractor fitted with mechanical turner. The composting process will take 8 to 10 weeks and the end product is a dark brown porous substance with earthy smell: the organic compost. The bioorganic compost will be used in the surrounding palm oil estates or sold locally.	
6. Potential public funding for the project from Parties in Annex I shall not be a diversion of official development assistance (ODA).		The details of project funding were discussed during the interview with the PP. The debt financing for the project was confirmed from the signed term Agreement with Pathgreen Investments Limited (private entity) for funding this project by the PP. The project did not involve any diversion of ODA. It was subsequently noted that the Buyer for this project was revised to Belektron d.o.o.	OK
7. If the project activity is a small scale one, confirm that it is not a debundled component of a large scale project, in line with appendix C of the simplified M&P for SSC CDM project activities and the Guidelines for assessment of de-bundling for SSC project activities.		The site visit confirmed that there was no similar project activity in the same project category/technology measure within 1 km of the project boundary. The site is surrounded by palm oil estate owned by one owner with more than 2 km radius.  LRQA therefore confirms that the project activity is not a debundled project activity.	OK

	Validated situation	Conclusion
<b>SECTION 5. Baseline and monitoring methodology</b>		
1. Has the baseline and monitoring methodologies selected by the project participants been previously approved by the CDM Executive Board, i.e. does it appear on the methodologies page of the UNFCCC website?	<p>Yes <input checked="" type="checkbox"/> No <input type="checkbox"/> NA <input type="checkbox"/></p> <p>The methodology applied to the project activity is AMS-III.F. At the time of web-hosting, the PDD reflected version 04 of the methodology while the UNFCCC webpage showed AMS-III.F version 05. The PDD was revised to AMS-III.F. Avoidance of methane emissions through composting EB 59 version 10</p> <p>Although AMS-III.F version 11.0 is now current, version 10.0 is valid for seeking registration until 25 Jan 2013.</p> <p>In addition, the PP has applied the following tools which were confirmed to have been available for application along with AMS-III.F.</p> <ul style="list-style-type: none"> <li>• Methodological tool “Emissions from solid waste disposal sites” Version 06.0.1</li> <li>• Tool to calculate project or leakage CO2 emissions from fossil fuel combustion, Version 02</li> </ul> <p>Both the applied tools are currently valid.</p>	<del>CAR 04</del> Closed OK
2. If the project activity is a Small Scale one; does it qualify within the threshold of the three possible types of small scale projects? Confirm information provided in the PDD.	<p>The project activity falls in Category III. OTHER PROJECT ACTIVITIES</p> <p>The project activity applies AMS-III.F – Avoidance of methane emissions through composting</p> <p>For Type III: project participants shall provide an estimation of emission reductions by the project activity over the crediting period and proof that the emission reductions every year will not go beyond the limits of 60 ktCO<sub>2</sub>e/y over the entire crediting period.</p>	OK

	Validated situation	Conclusion
	<p>The validation team, while validating the ER spreadsheet, confirmed that the assumptions are supported based on the project description and that default parameters as per approved methodology have been used.</p> <p>The validation team therefore confirms that the ERs are not expected to go beyond 60 ktCO<sub>2</sub>e in any year of the crediting period and therefore the project activity qualifies as a small scale CDM project activity</p>	
3. If the project activity is a Small Scale one; which approved small scale methodology does the project apply? Confirm that the SSC meth is applied in conjunction with the general guidelines to SSC CDM methodologies.	AMS-III.F - Avoidance of methane emissions through composting	OK

No.	Conditions in General guidelines to SSC CDM Methodologies	Steps taken to assess	Conclusion
Para 3	<p>Eligibility of project activities as small-scale CDM project activities:</p> <p>(a) The Board at its twentieth meeting<sup>2</sup> considered implications for the eligibility of project activities as small-scale project activities in cases where emissions of a proposed project activity are increasing during the crediting period and agreed that:</p> <p>(i) Small-scale CDM project activities shall remain under the limits for smallscale CDM project activities types, as stipulated in paragraph 6 (c) of the CDM modalities and procedures, every year during the crediting period;</p> <p>(ii) If a project activity goes beyond the limit of its type in any year of the crediting period, the emission reduction that can be claimed by the project activity during this particular year will be capped by the maximum emission reduction estimated in the CDM-SSC-PDD by the project participant for that year during the crediting period;</p> <p>(iii) Project participants shall demonstrate in the CDM-SSC-PDD that the project activity characteristics are defined in a way that precludes project activities to go beyond the limits:<sup>3</sup></p> <ul style="list-style-type: none"> <li>– For Type I: project participants shall provide proof that the installed capacity of the proposed project activity will not increase beyond 15 megawatt (MW);</li> <li>– For Type II: project participants shall provide proof that the efficiency improvements do not exceed the equivalent of 60 gigawatt hours (GWh) per year every year throughout the crediting period;</li> </ul> <p>For Type III: project participants shall provide an estimation of emission reductions by the project activity over the crediting period and proof that the emission reductions every year will not go beyond the limits of 60 ktCO<sub>2</sub>e/y over the entire crediting period.</p>	<p>The project activity is classified under Type III – Other project activities.</p> <p>The Emission Reductions from the project activity are less than 60 ktCO<sub>2</sub>e in each year of the crediting period. The PP has presented an Emission Reduction spreadsheet that calculates the Baseline Emissions, the Project Emissions in accordance with the requirements of the specified methodology. The validation team, while validating the spreadsheet, confirmed that the assumptions are supported based on the project description and that default parameters as per approved methodology have been used.</p> <p>The validation team therefore confirms that the ERs are not expected to go beyond 60 ktCO<sub>2</sub>e in any year of the crediting period.</p>	OK

No.	Conditions in General guidelines to SSC CDM Methodologies	Steps taken to assess	Conclusion
	<p>The three types of project activities outlined above, are mutually exclusive. In a project activity with more than one component that will benefit from simplified CDM modalities and procedures, each component shall meet the threshold criterion of each applicable type, e.g. for a project with both a renewable energy and an energy efficiency component, the renewable energy component shall meet the criterion for .renewable energy. and the energy efficiency component that for energy efficiency.;<sup>4</sup></p> <p>(c) The sum of the size of components of a project activity belonging to the same type (capacity for Type I, energy savings for Type II and emission reductions for Type III) should not exceed the limits for small-scale CDM project activities (e.g. the limit for methane recovery component is 60 ktCO<sub>2</sub>e/yr and the limit for the electricity production component is 15 MW output capacity).</p>		
	<p>Output capacity of renewable energy equipment: Definition of .maximum output capacity equivalent of up to 15 MW (or an appropriate equivalent).:</p> <p>(a) Definition of .maximum output.: .output. is the installed/rated capacity as indicated by the manufacturer of the equipment or plant,<sup>6</sup> disregarding the actual load factor of the plant;</p> <p>(b) Definition of .appropriate equivalent. of 15 MW: whereas decision 17/CP.7, paragraph 6 (c) (i), refers to MW, project proposals may refer to MW(p),<sup>7</sup> MW(e) or MW(th). As MW(e) is the most common denomination, the CDM Executive Board (the Board) has agreed to define MW as MW(e) and otherwise to apply an appropriate conversion factor;</p> <p>(c) For biomass, biofuel and biogas project activities, the maximal limit of 15 MW(e) is equivalent to 45 MW thermal output of the equipment or the plant (e.g. boilers). For thermal applications of biomass, biofuels or biogas (e.g. the cookstoves), the limit of 45 MWth is the installed/rated</p>	<p>Not applicable since renewable energy equipment is not employed in this project activity.</p>	<p>OK</p>

No.	Conditions in General guidelines to SSC CDM Methodologies	Steps taken to assess	Conclusion
	<p>capacity of the thermal application equipment or device/s (e.g. biogas stoves). For electrical or mechanical applications, the limit of 15 MW installed/rated output shall be used. In case of cofiring renewable and fossil fuels, the rated capacity of the system when using fossil fuel shall apply;</p> <p>(d) For thermal applications of solar energy projects, .maximum output. shall be calculated using a conversion factor of 700 Wth/m<sup>2</sup> of aperture area of glazed flat coat or evacuated tubular collector i.e. eligibility limit in terms of aperture area is 64000 m<sup>2</sup> of the collector. Project participants may also use other conversion factors determined as per the procedures prescribed for .equipment performance under paragraph 9 below, however it shall be justified why the chosen conversion factor is more appropriate to the project activity.</p>		
	<p>In accordance with paragraph 28 of the simplified modalities and procedures for small-scale CDM project activities, a simplified baseline and monitoring methodology may be used for a small-scale CDM project activity if project participants are able to demonstrate to a designated operational entity that the project activity would otherwise not be implemented due to the existence of one or more barrier(s) listed in attachment A of Appendix B of 4/CMP.1 Annex II</p> <p>&lt;<a href="http://cdm.unfccc.int/Reference/Guidclarif/ssc/index_guid.htm">http://cdm.unfccc.int/Reference/Guidclarif/ssc/index_guid.htm</a>&gt;.</p>	<p>The project activity has demonstrated through an investment barrier that the project activity would not have been otherwise implemented.</p> <p>An investment analysis was presented by the PP and validated by the team to confirm that the returns from the project activity without the CDM funds are not attractive.</p>	OK
	<p>For project activities up to five MW that employ renewable energy as their primary technology and for energy efficiency project activities that aim to achieve energy savings at a scale of no more than 20 GWh per year, simplified modalities for demonstrating additionality has been approved by the Board.9</p>	Not Applicable.	OK
	<p>7. For demonstration of additionality, the following documents provide additional guidance or guidelines.</p> <p>(a) EB 35, Annex 34 .Non-binding best practice examples to demonstrate additionality for SSC project activities. or its update</p>	Not Applied.	OK

No.	Conditions in General guidelines to SSC CDM Methodologies	Steps taken to assess	Conclusion
	<a href="http://cdm.unfccc.int/Reference/Guidclarif/ssc/index_guid.htm">http://cdm.unfccc.int/Reference/Guidclarif/ssc/index_guid.htm</a>  > (b) EB 50, Annex 13 .Guidelines for objective demonstration and assessment of barriers or its update <a href="http://cdm.unfccc.int/Reference/Guidclarif/meth/index_guid.htm">http://cdm.unfccc.int/Reference/Guidclarif/meth/index_guid.htm</a>  >.		
	Debundling is defined as the fragmentation of a large project activity into smaller parts. A small-scale project activity that is part of a large project activity is not eligible to use the simplified modalities and procedures for small-scale CDM project activities. Refer to EB 54, Annex 13 .Guidelines on assessment of de-bundling for SSC project activities. or its update <a href="http://cdm.unfccc.int/Reference/Guidclarif/ssc/index_guid.htm">http://cdm.unfccc.int/Reference/Guidclarif/ssc/index_guid.htm</a>  >.	Since the plantation extends for more than 2 kms from the project activity, the validation team confirms that there is no CDM project activity within a 2 km radius from the project activity.  The project is not a debundled fragment of a large project activity.	OK
	9. Equipment performance: To determine equipment performance, project participants shall use: (a) The appropriate value specified in the methodology that is being applied; (b) If the value specified in sub-paragraph (a) is not available, the national standard for the performance of the equipment type (project participants shall identify the standard used); (c) If the value specified in sub-paragraph (b) is not available, an international standard for the performance of the equipment type, such as International Organization for Standardization (ISO) and International Electrotechnical Commission (IEC) standards (project participants shall identify the standard used); (d) If a value specified in sub-paragraph (c) is not available, the manufacturer's specifications provided that they are tested and certified by national or international certifiers.	No equipment is used in the project activity other than transport vehicles, a shredding machine and a windrow turner.	OK
	Project participants have the option of using performance data from test results conducted by an independent entity for equipment installed under the project activity.	Not applicable based on reason provided above.	OK
	Project boundary: The project boundary shall be limited to the	Project boundary has been defined in accordance with the	OK



No.	Conditions in General guidelines to SSC CDM Methodologies	Steps taken to assess	Conclusion										
	physical project activity. Project activities that displace energy supplied by external sources shall earn certified emission reductions (CERs) for the emission reductions associated with the reduced supply of energy by those external sources.	methodology AMS-III.F Version 10.											
	Biomass projects: In the case of project activities using biomass, emission reductions may only be accounted for the combustion of .renewable biomass.. Refer to EB 23, Annex 18 .Definition of Renewable Biomass. or its update < <a href="http://cdm.unfccc.int/EB/023/eb23_repan18.pdf">http://cdm.unfccc.int/EB/023/eb23_repan18.pdf</a> >.	This project activity does not involve combustion of biomass. This general requirement is therefore not applicable.	OK										
	Leakage in biomass project activities: Refer to EB 47, Annex 28 .General guidance on leakage in biomass project activities. or its update < <a href="http://cdm.unfccc.int/Reference/Guidclarif/ssc/index_guid.htm">http://cdm.unfccc.int/Reference/Guidclarif/ssc/index_guid.htm</a> >.	During the site visit, it was confirmed that there is no other use for this EFB and POME and the conditions of anaerobic decomposition of both these wastes was confirmed. Therefore, there are no competing uses for the biomass.	OK										
	In the cases where leakage is to be considered, it shall be considered only within the boundaries of non-Annex I Parties.	There is no leakage with respect of this project activity.	OK										
	In the case of project participants using IPCC default values for emission coefficients, these shall be the most up-to-date values available in the 2006 IPCC Guidelines for National Greenhouse Gas Inventories and the revised 1996 IPCC Guidelines for National Greenhouse Gas Inventories.	<div>IPCC 2006 Guidelines for National Greenhouse Gas Inventories has been referred to for default values of emission coefficients.</div> <table><tr><td>EF<sub>composting</sub></td></tr><tr><td>t CH<sub>4</sub>/t waste</td></tr><tr><td>Emission factor for composting of organic waste</td></tr><tr><td>Table 4.1, chapter 4, Volume 5, 2006 IPCC Guidelines</td></tr><tr><td>0.004</td></tr></table> <div><table><tr><td>GWP<sub>CH4</sub></td></tr><tr><td>tCO<sub>2</sub>e / tCH<sub>4</sub></td></tr><tr><td>Global warming potential of methane</td></tr><tr><td>IPCC</td></tr><tr><td>21</td></tr></table></div>	EF <sub>composting</sub>	t CH <sub>4</sub> /t waste	Emission factor for composting of organic waste	Table 4.1, chapter 4, Volume 5, 2006 IPCC Guidelines	0.004	GWP <sub>CH4</sub>	tCO <sub>2</sub> e / tCH <sub>4</sub>	Global warming potential of methane	IPCC	21	OK
EF <sub>composting</sub>													
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Global warming potential of methane													
IPCC													
21													

No.	Conditions in General guidelines to SSC CDM Methodologies	Steps taken to assess	Conclusion
	<p>Monitoring: while monitoring the emission reductions from the small-scale project activity, project participants shall:</p> <p>(a) Electronically archive all data collected as part of monitoring for a period of two years from the end of the crediting period;</p> <p>(b) Data variables that are most directly related to the emission reductions (e.g. quantity of the fuel inputs, the amount of heat or electricity produced, gas captured) should be measured continuously. Data elements that are generally constant and indirectly related to the emission reductions (e.g. emission factors, calorific value, system efficiencies) should be measured or calculated at least once a year, unless detailed specifications are provided as part of the indicated methodology;</p> <p>(c) Measuring equipment should be certified to national or IEC standards and calibrated according to the national standards and reference points or IEC standards and recalibrated at appropriate intervals according to manufacturer specifications, but at least once in three years;</p> <p>(d) The measured data with high levels of uncertainty or without adequate calibration should be compared with location/national data and commercial data to ensure consistency;</p> <p>(e) Wherever a statistical sample is proposed for monitoring, the General guidelines for sampling and surveys for small-scale CDM project activities. &lt;<a href="http://cdm.unfccc.int/Reference/Guidclarif/ssc/index_guid.htm">http://cdm.unfccc.int/Reference/Guidclarif/ssc/index_guid.htm</a>&gt; shall be referred.</p>	<p>(a) The Data Storage section of PDD section B.7.2 clearly mentions that the data will be stored in electronic form, either in spreadsheet or database for ease of future verification and reference. The database shall be periodically updated and stored on CDs. There shall be three sets of database, clearly marked and stored at three different locations for safe-keeping. These CDs shall be checked annually and any defective one shall be replaced by duplicate copy from other site.</p> <p>Data storage will be handled by the Assistant Plant Manager under the supervision of the Compost Plant Manager. All monitoring records shall be kept for verification up to at least two years after the end of the project activity or the last issuance of CERs for this project activity, whichever occurs later.</p> <p>(b) Each data variable has been individually assessed to determine that it fulfills the requirements of the approved methodology. Please refer Section 5c of this validation protocol.</p> <p>(c) Confirmed as part of section 5c of the validation protocol.</p> <p>(d) Comparison with Local/ national data has been considered as appropriate.</p> <p>(e) No parameter within this project activity requires a statistical sample.</p>	OK
	<p>The revision of an approved SSC methodology or tool referred to in a SSC methodology shall not affect: (i) Registered CDM project activities during their crediting period; and (ii) Project activities that have been published for public comments for validation using the previously approved methodology or tool, so long as the project activity is submitted for registration</p>	<p>AMS-III.F Version 10 has been applied. This version of the methodology is valid for seeking registration until 25 January 2013.</p> <p>The methodology applied to the project activity is AMS-III.F. At the time of web-hosting, PDD reflected version 04 of the methodology while the UNFCCC webpage showed AMS-III.F version 05. CAR 04</p>	<p><del>CAR-04</del> Closed. OK</p>

No.	Conditions in General guidelines to SSC CDM Methodologies	Steps taken to assess	Conclusion
	within eight months of the date when the revision became effective. (See EB 34, Annex 7 .Revision of an approved small scale methodology by the Executive Board. < <a href="http://cdm.unfccc.int/Reference/Procedures/index.html">http://cdm.unfccc.int/Reference/Procedures/index.html</a> >).	was therefore raised. Subsequently, the PP applied AMS-III.F version 10. Although, the current version of the methodology is version 11, AMS-III.F Version 10 is valid for seeking registration until 25 January 2013. CAR 04 was therefore closed out.	
	<p>Type II and III Greenfield projects (new facilities): may use a Type II and Type III small-scale methodology provided that they can demonstrate that the most plausible baseline scenario for this project activity is the baseline provided in the respective Type II and Type III small-scale methodology. The demonstration should include the assessment of the alternatives of the project activity using the following steps:</p> <p><b>Step 1:</b> Identify the various alternatives available to the project proponent that deliver comparable level of service including the proposed project activity undertaken without being registered as a CDM project activity.</p> <p><b>Step 2:</b> List the alternatives identified per Step 1 in compliance with the local regulations (if any of the identified baseline is not in compliance with the local regulations, then exclude the same from further consideration).</p> <p><b>Step 3:</b> Eliminate and rank the alternatives identified in Step 2 taking into account barrier tests specified in attachment A to Appendix B of the simplified modalities and procedures of SSC CDM.</p> <p><b>Step 4:</b> If only one alternative remains that is:</p> <ul style="list-style-type: none"> <li>• Not the proposed project activity undertaken without being registered as a CDM project activity; and</li> <li>• It corresponds to one of the baseline scenarios provided in the methodology; then the project activity is eligible under the methodology.</li> </ul>	<p>EFB and POME have no other use and several literature articles reviewed show that EFB and POME are usually left to decay or decompose anaerobically. The pre-project scenario as confirmed during the site visit was the same and therefore the step-wise analysis was not considered necessary.</p> <p>Literature sources:</p> <ol style="list-style-type: none"> <li>1. A review of Palm oil mill effluent (POME) water treatment <i>J.C. Igwe and 2C.C. Onyegbado, Global Journal of Environmental Research, 2007</i></li> <li>2. Aerobic treatment of Palm oil mill effluent, Viayaraghavan, Journal of Environmental Management, 299</li> </ol> <p>This is not a Greenfield project in the sense of this requirement. A Greenfield project is one when a new composting project is implemented along with a new palm oil mill itself. When the palm oil mill is new, there would be no baseline scenario of POME treated in open anaerobic lagoons and EFB disposed in landfills. In that case, the most plausible baseline scenario of the region has to be established using the tool.</p> <p>In the project case, since the palm oil mill is existing and operating, the baseline scenarios of POME treated in open anaerobic lagoons and EFB disposed in landfills clearly existed and have been validated, this requirement does not apply.</p> <p>The baseline scenario is the situation where, in the absence of the project activity, biomass and other organic matter are left to decay within the project boundary and methane is emitted to the atmosphere. When wastewater is co-composted, baseline emissions include</p>	OK

No.	Conditions in General guidelines to SSC CDM Methodologies	Steps taken to assess	Conclusion
	If more than one alternatives remain that correspond to the baseline scenarios provided in the methodology, choose the alternative with the least emissions as the baseline.	emissions from wastewater co-composted in the project activity.  The validation team reviewed several registered projects and concluded that this step-wise determination approach is not applied. Refer projects – 3379, 3916, 4841 and 4907.	
	20. Retrofit: For project activities that seek to retrofit or modify an existing unit or equipment, the baseline may refer to the characteristics (i.e. emissions) of the existing unit or equipment only to the extent that the project activity does not increase capacity or output or level of service unless detailed specifications are provided as part of the indicated methodology. For any increase of capacity or output or level of service beyond this range, which is due to the project activity, a different baseline shall apply.	The project activity is not a retrofit. Therefore this condition is not applicable.	OK
	Capacity increase: Type II and III project activities involving capacity increase may use a Type II and Type III SSC methodology provided that they can demonstrate that the most plausible baseline scenario for the additional (incremental) capacity is the baseline provided in the respective Type II and III small-scale methodology. <sup>11</sup> The demonstration should include the assessment of the alternatives of the project activity using the steps described in paragraph 19 above.	This project activity does not involve capacity increase.	OK
	Lifetime of existing equipments: In case of replacement of existing equipment, project participants shall estimate the point in time where the existing equipment would be replaced in the absence of the project activity in accordance with the latest version of .Tool to determine the remaining lifetime of equipment..	No replacement of existing equipment takes place as part of this project activity	OK
	For household devices/appliances, the remaining lifetime may be disregarded.	Not applicable.	OK
	For guidance on consideration of national policies and circumstances in baseline scenarios EB 22, Annex 3 Additional clarifications regarding the treatment of	The validation team confirmed that the existing system of unmanaged dumping of EFB and lagoon treatment of generated POME is legally permitted. The records of treated wastewater that was being	OK

No.	Conditions in General guidelines to SSC CDM Methodologies	Steps taken to assess	Conclusion
	national/sectoral policies and circumstances or its update shall be referred to.	discharged from the anaerobic ponds were noted as meeting the regulatory limits.	
	Definition of Natural Gas: For the methodologies involving use of natural gas the following definition of natural gas applies: .Natural gas is defined as a gas which consists primarily of methane and which is generated from: (i) Natural gas fields (non-associated gas); and (ii) Associated gas found in oil fields. It may be blended up to 1% on a volume basis with gas from other sources, such as, <i>inter alia</i> , biogas generated in biodigesters, gas from coal mines, gas which is gasified from solid fossil fuels, etc.	Not applicable.	OK
	Norms, Specifications, Standards and Test Procedures cited in the SSC methodologies refer to the latest version of the documentation available at the time of submission of the CDM-SSCPDD to the DOE for validation.	This has been attended as appropriate in various sections.	OK

<p>4. Determine whether the methodology selected is applicable to the project activity including that the used version is valid.</p> <p>Describe steps taken to assess the relevant information contained in the PDD in the table below.</p>	<p>The PDD had initially applied version 04 of the methodology. CAR 04 was issued and the PP applied relevant versions in subsequent revisions of the PDD. The PDD Version 03.5 date 21/11/2012 now uses AMS-III.F Version 10 which is valid until 25/01/2013. CAR 04 was therefore closed.</p>	<p><del>CAR 04</del> Closed OK</p>
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No.	Applicability conditions in the AMS III.F ver 10	Information in the PDD	Steps taken to assess PDD information	Conclusion
1	This methodology comprises measures to avoid the emissions of methane to the atmosphere from biomass or other organic matter that would have otherwise been left to decay anaerobically in a solid waste disposal site (SWDS), or in an animal waste management system (AWMS), or in a wastewater treatment system (WWTS). In the project activity, controlled aerobic treatment by composting of biomass is introduced.	<p>Without the proposed CDM project activity the EFB would be left to decay anaerobically at an unmanaged dumpsite without any biogas recovery. The Keratong composting project proposes to implement a co-composting plant for EFB and POME to treat aerobically the waste from the palm oil mill. The composting process is a controlled biological treatment of biomass through aerobic treatment.</p> <p><i>Hence, meets the criteria.</i></p>	During the site visit, the team confirmed that the EFB was dumped in an unmanaged dump site and that POME was sent to retaining ponds where it was treated anaerobically prior to discharge.	OK
2	The project activity does not recover or combust landfill gas from the disposal site (unlike AMS-III.G .Landfill methane recovery.), and does not undertake controlled combustion of the waste that is not treated biologically in a first step (unlike AMS-III.E .Avoidance of methane production from decay of biomass through controlled combustion, gasification or mechanical/thermal treatment.). Project activities that recover biogas from wastewater treatment shall use methodology AMS-III.H .Methane recovery in wastewater treatment.. Project activities involving co-digestion of organic matters shall apply	<p>The proposed CDM project activity does not recover landfill gas from dump site and it does not carry out any combustion of waste that is not treated biologically.</p> <p><i>Hence, meets the criteria.</i></p>	<p>The details of the project description from the proposal from Harcos Construction dated 18/05/2007 makes mention of aerobic treatment of EFB and POME using trichoderma to produce Trichogreen compost.</p> <p>The project activity involves composting of EFB which is aerobic treatment and does not involve any land filling and therefore recovery of landfill gas is not possible.</p>	OK

No.	Applicability conditions in the AMS III.F ver 10	Information in the PDD	Steps taken to assess PDD information	Conclusion
	methodology AMS-III.AO .Methane recovery through controlled anaerobic digestion..			
3	Measures are limited to those that result in emission reductions of less than or equal to 60kt CO <sub>2</sub> equivalent annually.	The estimated annual emission reduction from the proposed project activity will not exceed 60ktCO <sub>2</sub> e during the crediting period. The highest emission that is expected from the project activity is 42,681 t CO <sub>2</sub> e / year.  <i>Hence, meets the criteria.</i>	Based on the ER spreadsheet provided and the validation of input and default values and the calculation as per formulae provided in the methodology AMS-III.F, the validation team can confirm that the annual ERs are to remain less than 60 ktCO <sub>2</sub> e.	OK
4	This methodology is applicable to the composting of the organic fraction of municipal solid waste and biomass waste from agricultural or agro-industrial activities including manure.	The project activity will treat EFB and waste water (biomass waste) from the palm oil mill which is an agro industry into organic compost.  <i>Hence, meets the criteria.</i>	EFB is a waste generated from palm oil mills which is an agro-industrial activity. Therefore, this condition is complied with.	OK
5	This methodology includes construction and expansion of treatment facilities as well as activities that increase capacity utilization at an existing facility. For project activities that increase capacity utilization at existing facilities, project participant(s) shall demonstrate that special efforts are made to increase the capacity utilization, that the existing facility meets all applicable laws and regulations and that the existing facility is not included in a separate CDM project activity. The special efforts should be identified and described.	This project activity will involve the construction of a new co-composting plant  Hence, this clause is not applicable to the project activity	This project activity involves construction of a new composting facility since no co-composting facility existed prior to the project activity.  This is not applicable to the project activity.	OK
6	This methodology is also applicable for co-composting wastewater and solid biomass waste, where wastewater would otherwise have been treated in an anaerobic wastewater treatment system without biogas recovery. The	The project activity is a co –composting facility where solid biomass (EFB) and wastewater (POME) which otherwise would have been treated in anaerobic wastewater treatment system without biogas recovery.	The project proposal from Harcos Construction dated 18/05/2007 describes the co-composting of EFB and POME through an aerobic process.	OK



No.	Applicability conditions in the AMS III.F ver 10	Information in the PDD	Steps taken to assess PDD information	Conclusion
	wastewater in the project scenario is used as a source of moisture and/or nutrients to the biological treatment process e.g. composting of empty fruit bunches (EFB), a residue from palm oil production, with the addition of palm oil mill effluent (POME) which is the wastewater co-produced from palm oil production.	The wastewater (POME) from the palm oil mill will be used as a source of moisture and nutrient to the co-composting process.  <i>Hence, meets the criteria.</i>	POME is used as a source of moisture and/or nutrients to the biological treatment process.	
7	In case of co-composting, if it can not be demonstrated that the organic matter would otherwise been left to decay anaerobically, baseline emissions related to such organic matter shall be accounted for as zero, whereas project emissions shall be calculated according to the procedures presented in this methodology for all co-composted substrates.	The project activity is a co –composting facility where solid biomass (EFB) and wastewater (POME) which otherwise would have been treated in anaerobic wastewater treatment system without biogas recovery. The wastewater (POME) from the palm oil mill will be used as a source of moisture and nutrient to the co-composting process  <i>Hence, meets the criteria.</i>	During the site visit, the validation team sighted the disposal of EFB and POME prior to the project activity. Anaerobic decomposition of both EFB and POME were confirmed.	OK
8	The location and characteristics of the disposal site of the biomass, animal manure and co-composting wastewater in the baseline condition shall be known, in such a way as to allow the estimation of its methane emissions, using the provisions of AMS-III.G, AMS-III.E (concerning stockpile), AMS-III.D .Methane recovery in animal manure management systems. or AMS-III.H respectively. Project activities for composting of animal manure shall also meet the requirements under paragraphs 1, and 2 (c) of AMS-III.D. Further no bedding material is used in the animal barns or intentionally added to the manure stream in the baseline. Blending materials may be added in the project scenario to increase	The location and characteristics of the dumpsite where EFB are currently being dumped is well known and has been validated by DOE.  <i>Hence, meets the criteria.</i>	The validation team confirmed the location and characteristics of the disposal site of EFB and POME that was in existence prior to the project activity.	OK



No.	Applicability conditions in the AMS III.F ver 10	Information in the PDD	Steps taken to assess PDD information	Conclusion
	the efficiency of the composting process (e.g. to achieve a desirable C/N ratio or free air space value), however, only monitored quantity of solid waste or manure or wastewater diverted from the baseline treatment system is used for emission reduction calculation. The following requirement shall be checked <i>ex ante</i> at the beginning of each crediting period: (a) Establish that identified landfill(s)/stockpile(s) can be expected to accommodate the waste to be used for the project activity for the duration of the crediting period; or (b) Establish that it is common practice in the region to dispose off the waste in solid waste disposal site (landfill)/stockpile(s).			
9	The project participants shall clearly define the geographical boundary of the region referred in paragraph 8 (b), and document it in the CDM-PDD. In defining the geographical boundary of the region, project participants should take into account the source of the waste i.e. if waste is transported up to 50 km, the region may cover a radius of 50 km around the project activity. In addition, it should also consider the distance to which the final product after composting will be transported. In either case, the region should cover a reasonable radius around the project activity that can be justified with reference to the project circumstances but in no case it shall be more than 200 km. Once defined, the region should not be changed during the crediting period(s).	<p>The geographical boundary of the project activity has been defined in section B.3.</p> <p>The compost will be used in the plantations that are located at a distance of approximately 5kms (10kms round trip) which is less than 200kms.</p> <p>Also, the EFB is transported from distance less than 15kms.</p> <p><i>Hence, meets the criteria.</i></p>	<p>The source of the waste is Tee Teh Sdn. Berhad which is located less than 15 kms from the project activity.</p> <p>Through discussions with the PP, it was established that the produced compost is to be utilised in the plantations located approximately 5 kms from the project site.</p>	OK
10	In case produced compost is handled aerobically and submitted to soil application,	Proper measures shall be taken to ensure	The project proposal does mention that the windrows where shredded EFB are	OK

No.	Applicability conditions in the AMS III.F ver 10	Information in the PDD	Steps taken to assess PDD information	Conclusion
	the proper conditions and procedures (not resulting in methane emissions) must be ensured.	that there are no methane emissions while handling the produced compost aerobically and submitting it to soil application.  <i>Hence, meets the criteria.</i>	laid are to be sprayed with POME every three days and the windrows are to be thoroughly turned every three days for aeration. This will ensure that aerobic conditions are maintained.	
11	In case produced compost is treated thermally/mechanically, the provisions in AMS-III.E related to thermal/mechanical treatment shall be applied.	The produced compost will not be treated thermally /mechanically.  Hence this condition is not applicable.	Nothing in the project proposal suggested any thermal or mechanical treatment.	OK
12	In case produced compost is stored under anaerobic conditions and/or delivered to a landfill, emissions from the residual organic content shall to be taken into account and calculated as per the latest version of the .Tool to determine methane emissions avoided from disposal of waste at a solid waste disposal site..	The compost will be handled aerobically and used for soil application. Hence, no emissions are expected from storage of compost under anaerobic conditions.  <i>Hence, meets the criteria.</i>	The compost is intended for application in the plantations nearby and there is going to be no lag time between generation of compost to its application to cause any anaerobic conditions.	OK

	Validated situation	Conclusion
5. Confirm that any specific guidance provided by the CDM Executive Board in respect to an approved methodology has been correctly applied.	The approved methodology AMS-III.F has been appropriately applied.	OK
6. If a determination regarding the applicability of the selected methodology to the proposed CDM project activity cannot be made, request clarification of the methodology in line with the guidance provided by the CDM Executive Board.  Describe the clarification request and response.	Not applicable since all the applicability conditions of the methodology, AMS-III.F are fulfilled.	OK

	Validated situation	Conclusion
<p>7. If the Validation Team determines that the proposed CDM project activity does not comply with the applicability conditions of the methodology, the Team may proceed by means of requesting revision to or deviation from the methodology in line with the guidance provided by the CDM Executive Board.</p> <p>Describe the request for revision or deviation and approval by the CDM Executive Board.</p>	Not applicable since all the applicability conditions of the methodology, AMS-III.F are fulfilled.	OK
<p>8. If there are any GHG emissions occurring within the proposed CDM project activity boundary, which are not addressed by the applied methodology and which are expected to contribute more than 1% of the overall expected average annual emissions reductions as a result of the implementation of the project but a determination is made that the approved methodology(ies) is/are applicable to the project activity, provide here information about them in relation to the applicability criteria and justify the determination.</p>	No GHG emissions were identified within the project boundary which could contribute to more than 1% of the overall average annual emission reductions.	OK

	Validated situation	Conclusion
<b>SECTION 5a. Project boundary</b>		
1. Does the project boundary include physical, geographical site of the industrial facility, processes or equipment that are affected by the project activity?	Yes <input checked="" type="checkbox"/> No <input type="checkbox"/> NA <input type="checkbox"/>	OK
2. Confirm that all sources and GHGs required by the methodology have been included within the project boundary.  Describe here if any emission source that will be affected by the project activity and is not addressed by the approved methodology, has been identified. In such case request clarification of, revision to or deviation from the methodology in accordance with EB guidance.  Use the table below for this purpose:	<p>The project boundary is the physical, geographical site where:</p> <ul style="list-style-type: none"> <li>• The solid waste would have been disposed of and the methane emission occurs in the absence of the proposed project activity: dumping site for EFB;</li> <li>• The co-composting wastewater would have been treated anaerobically in the absence of the project activity (the anaerobic pond);</li> <li>• The treatment of biomass through composting takes place;</li> <li>• The residual waste from biological treatment (organic compost) are submitted to soil application;</li> <li>• The transportation of waste, wastewater, compost occur (itineraries between all locations mentioned above).</li> </ul> <p>The project boundary identification is in accordance with the requirements of AMS-III.F.</p>	OK

Gases and Sources Included In The Project Boundary						
	Source	Gas	Inc./Exc. PDD	Justification PDD	Steps Taken To Assess PDD Justification	Conclusion
BASELINE Emissions	Anaerobic open ponds and unmanaged dumping of EFB in the dumping site	CH <sub>4</sub>	Included	Methane generated from the open ponds and anaerobic decay of unmanaged EFB dumping	<p>In the absence of the proposed CDM project activity, the solid waste biomass (EFB) would be dumped in an unmanaged solid waste disposal site close to the mill and left to decay in anaerobic conditions. Also, the wastewater produced during the processing of the FFB would be treated anaerobically in an open pond system to reduce its COD before being discharged in the local waterways, with consequent release of methane to the atmosphere.</p> <p>AMS-III.F considers the following parameters:</p> <p><math>BE_{CH_4, SWDS,y}</math> - Yearly methane generation potential of the solid waste composted by the project activity during the years x from the beginning of the project activity.</p> <p><math>BE_{ww,treatment,y}</math> - Baseline emissions from the wastewater co-composted, calculated as per the procedures in AMS-III.H</p>	OK
	Transportation	CO <sub>2</sub>	Included	POME will be pumped directly from the anaerobic ponds to the windrows. Thus there will be no incremental transportation for wastewater. The project emissions from the incremental CO <sub>2</sub> emissions due transportation by trucks of EFB and compost are considered.	Equation 6 in the PDD includes the relevant parameters to calculate the PE resulting from transportation of EFB and compost.	OK
PROJECT Emissions	Power	CO <sub>2</sub>	Excluded	No project emissions are considered from the electricity used for the additional machineries in the project activity as the power is generated using biomass fuel in the palm oil mill which is	A letter from Tee Teh Palm Oil Mill dated 12 April 2010 confirms that the power requirement for the composting facility will be provided from the biomass based power plant.	OK

Gases and Sources Included In The Project Boundary						
	Source	Gas	Inc./Exc. PDD	Justification PDD	Steps Taken To Assess PDD Justification	Conclusion
				considered as carbon neutral.	<p>Interviewed PP and obtained a confirmation from the mill owner that the mill is using biomass to generate steam to run turbine generator set. During the site visit, the validation team confirmed that the mill is far away from town and no grid connected electricity supply exists.</p> <p>As such, it is justified to not consider related emissions from power consumption.</p>	
	Fossil Fuel	CO <sub>2</sub>	Included	Emissions are expected from vehicles used to turn the windrow at the composting sites. Diesel consumption for compost turners and backhoe will be monitored in the project activity.	<p>Related parameter <math>FC_{\text{diesel, onsite, y(L)}}</math> has been considered in B.7.1 along with density of diesel, in kg/l; NCV diesel in TJ/Gg and <math>EF_{\text{CO}_2, \text{diesel}}</math> whose default value appears in B.6.2.</p> <p>Equipment such as turners and back hoe do work that requires energy. Although they move, they are not considered as transportation and rightly considered as part of energy consumption from fossil fuel use.</p>	OK
	Composting Process	CH <sub>4</sub>	Included	The methane emissions from the composting will be monitored using the oxygen meter to ensure that the composting process is in aerobic conditions.	Related parameter of quantity of compost, $Q_y$ and a default $EF_{\text{composting}}$ and $GWP_{\text{CH}_4}$ is applied in the relevant section of the PDD.	OK
	Run-off water	CH <sub>4</sub>	Excluded	The run-off water will be fed to the composting piles as moisture and nutrient. Thus, the project emission from this source is considered as zero.	<p>No run-off is generated as per project design since it is to be covered with a sheet to avoid rain. Also, the leachate is collected and applied on EFBs.</p> <p>The run-off water is recycled back to the composting piles for improving the moisture and nutrient. Thus, the project emission from</p>	OK

Gases and Sources Included In The Project Boundary						
	Source	Gas	Inc./Exc. PDD	Justification PDD	Steps Taken To Assess PDD Justification	Conclusion
					this source is considered as zero.	
	Residual waste	CH <sub>4</sub>	Excluded	No methane emisisions from the compost due to anaerobic storage or disposal in landfill as the final compost will be evenly applied in the palm oil plantation.	<p>Since the compost facility is located very close to plantations, discussions with the PP confirmed that compost will be applied directly and that there will be no accumulation of compost.</p> <p>Therefore exclusion of emissions from this source is justified.</p>	OK

	Validated situation	Conclusion
<b>SECTION 5b. Baseline identification</b>		
1. Determine whether the PDD provides a verifiable description of the identified baseline scenario, including a description of the technology that would be employed and/or the activities that would take place in the absence of the proposed CDM project activity.	<p>The PDD describes the baseline situation as under:</p> <p>In the absence of the proposed CDM project activity, the solid waste biomass (EFB) would be dumped in an unmanaged solid waste disposal site close to the mill and left to decay in anaerobic conditions. Also, the wastewater produced during the processing of the FFB would be treated anaerobically in an open pond system to reduce its COD before being discharged in the local waterways, with consequent release of methane to the atmosphere.</p> <p>During the site visit in December 2007, the validation team confirmed the disposal of EFB in unmanaged landfill and POME in anaerobic ponds.</p>	OK
2. Confirm that any procedure contained in the methodology to identify the most reasonable baseline scenario, has been correctly applied.	<p>Yes <input checked="" type="checkbox"/> No <input type="checkbox"/> NA <input type="checkbox"/></p> <p>The methodology AMS III.F. provides the baseline scenario as under:</p> <p>The baseline scenario is the situation where, in the absence of the project activity, biomass and other organic matter (including manure where applicable) are left to decay within the project boundary and methane is emitted to the atmosphere.</p> <p>This baseline scenario is exactly the pre-project scenario for the project activity.</p>	OK
3. Check each step in the procedure described in the PDD to identify the baseline scenario against the requirements of the methodology. (Note that if the methodology requires use of tools, i.e. such as the tool for the demonstration and assessment of additionality and the combined tool to identify the baseline scenario and demonstrate additionality, the guidance in the methodology shall supersede it in the tool.)	Not applicable.	OK



	Validated situation	Conclusion
4. Based on financial expertise and local and sectoral knowledge, determine whether all scenarios that are considered by the project participants and are supplementary to those required by the methodology, are reasonable in the context of the proposed CDM project activity and that no reasonable alternative scenario has been excluded. Use the table below for this purpose:	Not applicable.	OK
5. Determine whether the baseline scenario identified is reasonable by validating the assumptions, calculations and rationales used, as described in the PDD. It shall be ensured that documents and sources referred to in the PDD are correctly quoted and interpreted. Cross check the information provided in the PDD with other verifiable and credible sources, such as local expert opinion. The table above may be used for this purpose.	Not applicable since the baseline scenario defined in the methodology is exactly the pre-project scenario for the project activity.	OK
6. Is the identified baseline scenario in line with regulatory or legal requirements and does it take into account relevant national and/or sectoral policies?	<p>The practice of unmanaged disposal of EFB in a solid waste landfill facility is permitted by relevant legal requirements.</p> <p>The baseline scenario or pre-project scenario for POME disposal was through anaerobic treatment in ponds. The effluent waste-water characteristics from these ponds were noted to be within the specified legal limits.</p> <p>The identified baseline scenario is in line with regulatory/ legal requirements for the host country.</p>	OK
7. Is this identification supported by official and/or verifiable documents (for example, studies, web pages, certificates, etc)?	Several similar project activities have been registered for CDM.	OK

	Validated situation	Conclusion
<b>SECTION 5c. Algorithms and/or formulae used to determine emission reductions</b>		
<p>1. Compare the equations and parameters in the PDD to those in the selected approved methodology and determine if they have been correctly applied to calculate project emissions, baseline emissions, leakage, and emission reductions.</p> <p>Confirm that adequate justification has been provided for selection between different options.</p>	<p>Equation 1 in PDD <math>ER_y = BE_y - (PE_y + LE_y)</math> is the same as equation 6 used in AMS-III.F., <math>ER_y = BE_y - (PE_y + LE_y)</math></p> <p>Equation 2 in the PDD <math>BE_y = BE_{CH_4, SWDS, y} - BE_{ww, y} + BE_{CH_4, manure, y} - MD_{y, reg} * GWP_{CH_4}</math> is the same as equation 1 used in AMS-III.F. <math>BE_y = BE_{CH_4, SWDS, y} + BE_{ww, y} + BE_{CH_4, manure, y} - MD_{y, reg} * GWP_{CH_4}</math></p> <p>Equation 3 in the PDD <math>BE_{CH_4, SWDS, y} =</math> <math display="block">\phi_y \cdot (1 - f_y) \cdot GWP_{CH_4} \cdot (1 - OX) \cdot \frac{16}{12} \cdot F \cdot DOC_{f, y} \cdot MCF_y \cdot \sum_{x=1}^y \sum_j W_{j, x} \cdot DOC_j \cdot e^{-k_j \cdot (y-x)} \cdot (1 - e^{-k_j})</math> is the same as equation 1 in the tool "Emissions from solid waste disposal sites" version 6.0.1 <math display="block">= \phi_y \cdot (1 - f_y) \cdot GWP_{CH_4} \cdot (1 - OX) \cdot \frac{16}{12} \cdot F \cdot DOC_{f, y} \cdot MCF_y \cdot \sum_{x=1}^y \sum_j W_{j, x} \cdot DOC_j \cdot e^{-k_j \cdot (y-x)} \cdot (1 - e^{-k_j})</math></p> <p>Equation 4 in the PDD <math>BE_{ww, treatment, y} = \sum_i (Q_{ww, i, y} * COD_{inf, low, i, y} * \eta_{COD, BL, i} * MCF_{ww, treatment, BL, i}) * B_{o, ww} * UF_{BL} * GWP_{CH_4}</math> is the same as equation 2 in AMS III.H ver 16. <math display="block">BE_{ww, treatment, y} = \sum_i (Q_{ww, i, y} * COD_{inf, low, i, y} * \eta_{COD, BL, i} * MCF_{ww, treatment, BL, i}) * B_{o, ww} * UF_{BL} * GWP_{CH_4}</math></p> <p>Equation 5 in the PDD</p>	<p>CAR05 Closed OK</p>

	<p> <math>PE_y = PE_{y,transp} + PE_{y,power} + PE_{y,comp} + PE_{y,runoff} + PE_{y,res\ waste}</math> </p> <p>is the same as equation 2 in AMS-III.F.</p> <p> <math>PE_y = PE_{y,transp} + PE_{y,power} + PE_{y,comp} + PE_{y,runoff} + PE_{y,res\ waste}</math> </p> <p> <math>PE_{y,runoff} = 0</math> is justified since there is no run-off from the project activity. The windrows cover sheets are specifically designed to allow rainwater runoff and hence minimise leaching from the EFB under composting. The permeable cover allows free flow of air for composting activities. A collection sump / retention pond collects this run off and spills from the composting site. Any run-off that is generated is fed back into the composting piles for moisture and nutrient. Thus, the project emission from runoff water is estimated as zero.         </p> <p> <math>PE_{y,res\ waste} = 0</math> is justified since there is no storage associated with the compost. Compost generated through the composting activity is applied on nearby plantations and therefore there are no methane emissions as a result of storage of this compost.         </p> <p>Equation 6 in the PDD</p> <p> <math>PE_{y,transp} = (Q_y / CT_y) * DAF_w * EF_{CO2} + (Q_{y,treatment} / CT_{y,treatment}) * DAF_{treatment} * EF_{CO2}</math> </p> <p>is the same as equation 3 in AMS-III.F.</p> <p> <math>PE_{y,transp} = (Q_y / CT_y) * DAF_w * EF_{CO2} + (Q_{y,treatment} / CT_{y,treatment}) * DAF_{treatment} * EF_{CO2}</math> </p> <p>The PDD has correctly considered the transport emissions arising from incremental transport (from baseline scenario) of EFB for composting and emissions arising from transport for disposal of compost onto plantations. Since the wastewater (POME) is pumped electrically and this electricity supply is from a biomass power plant, there are no emissions associated with transport of this wastewater. The validation team confirmed that biomass fuelled power plant is the only source of electricity generation at the site since the site is located remotely.</p> <p>Equation 7 in the PDD</p>	
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	<p> <math display="block">PE_{y,power} = PE_{elec,y} + PE_{y,diesel,onsite},</math> </p> <p>According to paragraph 17 of AMS-III.F. Version 10, for the calculation of project emissions from electricity and/or fossil fuel consumption by the project activity facilities (<math>PE_{y,power}</math>) all the energy consumption of all equipment/devices installed by the project activity shall be included e.g. energy used for aeration and/or turning of compost piles/heaps, chopping of biomass for size reduction, screening, drying of the final compost product and for the runoff wastewater treatment.</p> <p>Emission factors for grid electricity used shall be calculated as described in AMS-I.D Grid connected renewable electricity generation. For project activity emissions from fossil fuel consumption the emission factor for the fossil fuel shall be used (tCO<sub>2</sub>/tonne). Local values are to be used; if local values are difficult to obtain, IPCC default values may be used.</p> <p>Equation 8 in the PDD</p> <p> <math display="block">PE_{elec,y} = EC_{PE,elec,y} * EF_{CO2,elec,y}</math> </p> <p>Since, the power is to be sourced from a biomass power plant, a carbon neutral fuel, the emissions from this source are zero.</p> <p>In calculating the project emissions from use of fuel for heavy equipment such as turner, back hoe, etc., the PP has correctly applied the equations arising from the Tool to calculate project or leakage CO<sub>2</sub> emissions from fossil fuel combustion, version 02.</p> <p>Equations 1 &amp; 4 from the tool have been correctly applied in deriving the related project emissions.</p> <p> <math display="block">PE_{FC,j,y} = \sum_i FC_{i,j,y} \times COEF_{i,y}</math> </p> <p> <math display="block">COEF_{i,y} = NCV_{i,y} \times EF_{CO2,i,y}</math> </p> <p>Equations 9, 10, 11 below refers to use of the equations from the tool as well as a conversion factor from litres to kg for diesel.</p>	
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	<p>Equation 9 in the PDD</p> $PE_{\text{diesel, onsite, y}} = FC_{\text{diesel, onsite, y(L)}} * COEF_{\text{diesel, y}}$ <p>Equation 10 in the PDD</p> $FC_{\text{diesel, onsite, y(T)}} = FC_{\text{diesel, onsite, y(L)}} * \rho_{\text{diesel}} \text{ (kg/l)}$ <p>Equation 11 in the PDD</p> $COEF_{\text{diesel, y}} = NCV_{\text{diesel}} * EF_{\text{CO2, diesel, onsite, y}}$ <p>Equation 12 in the PDD is</p> $PE_{y \text{ comp}} = Q_y * EF_{\text{composting}} * GWP_{CH_4}$ <p>is the same as equation 4 in AMS-III.F</p> $PE_{y, comp} = Q_y * EF_{\text{composting}} * GWP_{CH_4}$ <p><u>Leakage</u></p> <p>According to AMS-III.F. Version 10, Leakage is to be considered only if the project technology equipment is transferred from another activity or if the existing equipment is transferred to another activity. Since there is no transfer of equipment, there is no leakage.</p> <p>CAR05 was initially raised since all relevant parameters required as per methodology were not included in section B.6.2 and B.7.1. In the revised PDD submitted, all parameters were considered as appropriate and this finding has been closed.</p>									
<p>2. Verify the justification given in the PDD for the choice of data and parameters used in the equations to determine estimated emission reductions.</p> <p>If data and parameters will not be monitored throughout the crediting period and will remain fixed, assess that all data sources and assumptions are appropriate and calculations are correct, applicable to the proposed CDM project activity and will result in a conservative estimate</p>	<table><tr><th>Data/Parameter title: <math>\phi_y</math></th><th>Comments</th></tr><tr><td>Title in line with methodology?</td><td>Model Correction Factor Adopted from Tool, "Emissions from solid waste disposal site".</td></tr><tr><td>Fixed throughout the crediting period?</td><td>Yes</td></tr><tr><td>Data unit correctly expressed?</td><td>Yes, no unit</td></tr></table>	Data/Parameter title: $\phi_y$	Comments	Title in line with methodology?	Model Correction Factor Adopted from Tool, "Emissions from solid waste disposal site".	Fixed throughout the crediting period?	Yes	Data unit correctly expressed?	Yes, no unit	OK
Data/Parameter title: $\phi_y$	Comments									
Title in line with methodology?	Model Correction Factor Adopted from Tool, "Emissions from solid waste disposal site".									
Fixed throughout the crediting period?	Yes									
Data unit correctly expressed?	Yes, no unit									

<p>of the emission reductions.</p> <p>If data and parameters will be monitored on implementation and hence become available only after validation of the project activity, confirm that the estimates provided in the PDD for these data and parameters are reasonable.</p> <p>List all data and parameters provided in the PDD in the tables in next column.</p>	Appropriate description of parameter?	Description in tool is as under: "Default value of model correction factor to account for model uncertainties"	
	Source clearly referenced?	Yes	
	Value provided is considered reasonable?	Yes (0.85) As per table 3 of the tool referenced.	
	Has this value been verified?	Yes, it matches with the default provided for Application B.	
	Choice of data correctly justified?	Yes	
	Measurement method correctly described?	Not Applicable.	
	Data/Parameter title: <b>OX</b>	Comments	
	Title in line with methodology?	Oxidation Factor	
	Fixed throughout the crediting period?	Yes	
	Data unit correctly expressed?	Yes, no unit	
	Appropriate description of parameter?	Description in tool, "Oxidation Factor"	
	Source clearly referenced?	Yes	
	Value provided is considered reasonable?	Yes. (0.1), As per tool, "Emissions from solid waste disposal site".	
	Has this value been verified?	Yes it matches with that specified in the tool.	
	Choice of data correctly justified?	Yes	
	Measurement method correctly described?	Not Applicable	
	Data/Parameter title: <b>F</b>	Comments	
	Title in line with methodology?	Volume fraction of methane in SWDS gas	
	Fixed throughout the crediting period?	Yes	
	Data unit correctly expressed?	Yes, no unit	
	Appropriate description of parameter?	Yes	
	Source clearly referenced?	Yes	
	Value provided is considered reasonable?	Yes(0.5)	

	Has this value been verified?	Yes, it matches with that specified in the tool.	
	Choice of data correctly justified?	Yes	
	Measurement method correctly described?	Not Applicable	
	Data/Parameter title: <b>MCF<sub>y</sub></b>	Comments	
	Title in line with methodology?	Methane correction factor	
	Fixed throughout the crediting period?	Yes	
	Data unit correctly expressed?	Yes, no unit	
	Appropriate description of parameter?	Yes. Description matches tool	
	Source clearly referenced?	Yes	
	Value provided is considered reasonable?	Yes, 0.4	
	Has this value been verified?	Yes. According to the tool, this is default for unmanaged disposal in SWDS where depth is less than 5 meters.  The validation team confirmed that the depth was less than 5 m.	
	Choice of data correctly justified?	Yes	
	Measurement method correctly described?	Not Applicable.	
	Data/Parameter title: <b>k<sub>j</sub></b>	Comments	
	Title in line with methodology?	Decay rate for the waste type j	
	Fixed throughout the crediting period?	Yes	
	Data unit correctly expressed?	Yes, no unit	
	Appropriate description of parameter?	Yes, as per tool,	
	Source clearly referenced?	Yes( 0.17)	
	Value provided is considered reasonable?	Yes based on Table 5 in the tool for garden waste in tropical climates. This is appropriate since the characteristics of EFB are	

		similar to garden waste. Tropical climate for Malaysia was confirmed based on a presentation titled, "Influence of Climate Change on Malaysia's Weather Pattern" by Wan Azli and Wan Hassan, Malaysian Meteorological Department Ministry of Science, Technology and Innovation, April 2010.	
	Has this value been verified?	Yes.	
	Choice of data correctly justified?	Yes.	
	Measurement method correctly described?	Not Applicable.	
	<b>Data/Parameter title: DOC<sub>j</sub></b>		
	Title in line with methodology?	Fraction of degradable organic carbon in the waste type j	
	Fixed throughout the crediting period?	Yes	
	Data unit correctly expressed?	Yes, no unit	
	Appropriate description of parameter?	Yes	
	Source clearly referenced?	Yes	
	Value provided is considered reasonable?	Yes (0.2)	
	Has this value been verified?	Yes. Value is based on Table 4 in the tool for wet garden waste. This is appropriate since the characteristics of EFB are similar to garden waste.	
	Choice of data correctly justified?	Yes. As per above	
	Measurement method correctly described?	Not applicable	
	<b>Data/Parameter title: B<sub>o,ww</sub></b>		
	Title in line with methodology?	Methane producing capacity	



	of the wastewater
Fixed throughout the crediting period?	Yes
Data unit correctly expressed?	kg CH <sub>4</sub> /kg COD
Appropriate description of parameter?	Yes, as per AMS-III.F
Source clearly referenced?	Yes, IPCC 2006
Value provided is considered reasonable?	Yes, 0.25
Has this value been verified?	Yes
Choice of data correctly justified?	Yes
Measurement method correctly described?	Not Applicable
Data/Parameter title: <b>MCF</b> <sub>ww.treatment,BL,i</sub>	Comments
Title in line with methodology?	Methane correction factor for the baseline wastewater treatment system.
Fixed throughout the crediting period?	Yes
Data unit correctly expressed?	Yes. No unit
Appropriate description of parameter?	Yes. Description is as per AMS-III.H
Source clearly referenced?	Yes.
Value provided is considered reasonable?	Yes (0.8)
Has this value been verified?	This is as per table III.H.1 in methodology AMS-III.H corresponding to anaerobic deep lagoons.  The depth in the lagoons was confirmed to be more than 2 metres through review of engineering drawing of the lagoons by Professional Engineering Consultant A. K. Ong. This engineering drawing was noted approved by the Department of Environment.
Choice of data correctly justified?	Yes.

	Measurement method correctly described?	Not Applicable
	Data/Parameter title: <b>UF<sub>BL</sub></b>	Comments
	Title in line with methodology?	Model correction factor for
	Fixed throughout the crediting period?	Yes
	Data unit correctly expressed?	Yes. No unit
	Appropriate description of parameter?	Model correction factor for model uncertainties as per AMS-III.H
	Source clearly referenced?	Yes
	Value provided is considered reasonable?	Yes (0.89)
	Has this value been verified?	Yes. Checked that this corresponds to the default value provided in AMS-III.H Version 16.
	Choice of data correctly justified?	Yes.
	Measurement method correctly described?	Not applicable.
	Data/Parameter title: <b>EF<sub>CO<sub>2</sub>, diesel</sub></b>	Comments
	Title in line with methodology?	CO <sub>2</sub> emission factor of fuel used for transportation
	Fixed throughout the crediting period?	Yes
	Data unit correctly expressed?	Yes. Kg CO <sub>2</sub> /km
	Appropriate description of parameter?	Yes
	Source clearly referenced?	Yes. CO <sub>2</sub> emission factor for fuel use due to transportation as per AMS-III.F
	Value provided is considered reasonable?	Yes. (0.9)
	Has this value been verified?	AMS-III.F allows use of IPCC or local values for this parameter  According to PDD 1 litre diesel contributes to 2.7 kg CO <sub>2</sub> emissions. Reference source not traceable.

		<p>Confirmed through review of University of Malaya (2005) “Energy Used in the Transportation Sector of Malaysia”, Page 230 that a heavy duty lorry consumes 32.85 litres/ 100 km, i.e. 0.3285 Litres/ Km.</p> <p>IPCC provides EF of diesel as 74100 kg/TJ and NCVdiesel is 43 TJ/Gg. Therefore, EF = 74100 kg/TJ x 43 TJ/Gg x 0.3285 l/km x 0.84kg/l = 0.88 kg CO2/ Km. Value provided is reasonable.</p>																					
	Choice of data correctly justified?	Yes																					
	Measurement method correctly described?	Not Applicable																					
	<table><tr><th>Data/Parameter title: <b>EF<sub>CO2,diesel</sub></b></th><th>Comments</th></tr><tr><td>Title in line with methodology?</td><td>CO<sub>2</sub> emission factor of fuel used for transportation</td></tr><tr><td>Fixed throughout the crediting period?</td><td>Yes</td></tr><tr><td>Data unit correctly expressed?</td><td>kgCO<sub>2</sub>/km</td></tr><tr><td>Appropriate description of parameter?</td><td>Yes</td></tr><tr><td>Source clearly referenced?</td><td>Yes</td></tr><tr><td>Value provided is considered reasonable?</td><td>Yes. 0.9</td></tr><tr><td>Has this value been verified?</td><td>Yes. As per study report from the University of Malaya (2005) “Energy Used in the Transportation Sector of Malaysia”, Page 230.</td></tr><tr><td>Choice of data correctly justified?</td><td>Yes</td></tr><tr><td>Measurement method correctly described?</td><td>Not Applicable</td></tr></table>	Data/Parameter title: <b>EF<sub>CO2,diesel</sub></b>	Comments	Title in line with methodology?	CO <sub>2</sub> emission factor of fuel used for transportation	Fixed throughout the crediting period?	Yes	Data unit correctly expressed?	kgCO <sub>2</sub> /km	Appropriate description of parameter?	Yes	Source clearly referenced?	Yes	Value provided is considered reasonable?	Yes. 0.9	Has this value been verified?	Yes. As per study report from the University of Malaya (2005) “Energy Used in the Transportation Sector of Malaysia”, Page 230.	Choice of data correctly justified?	Yes	Measurement method correctly described?	Not Applicable		
Data/Parameter title: <b>EF<sub>CO2,diesel</sub></b>	Comments																						
Title in line with methodology?	CO <sub>2</sub> emission factor of fuel used for transportation																						
Fixed throughout the crediting period?	Yes																						
Data unit correctly expressed?	kgCO <sub>2</sub> /km																						
Appropriate description of parameter?	Yes																						
Source clearly referenced?	Yes																						
Value provided is considered reasonable?	Yes. 0.9																						
Has this value been verified?	Yes. As per study report from the University of Malaya (2005) “Energy Used in the Transportation Sector of Malaysia”, Page 230.																						
Choice of data correctly justified?	Yes																						
Measurement method correctly described?	Not Applicable																						



	Choice of data correctly justified?	Yes.
	Measurement method correctly described?	Not Applicable
	<b>Data/Parameter title: EF<sub>composting</sub></b>	<b>Comments</b>
	Title in line with methodology?	Emission factor for composting of organic waste
	Fixed throughout the crediting period?	Yes
	Data unit correctly expressed?	Yes. t CH <sub>4</sub> /t waste
	Appropriate description of parameter?	Yes. Emission factor for composting of waste
	Source clearly referenced?	Yes. Reference of IPCC has been provided. AMS III.F also provides default value for wet waste
	Value provided is considered reasonable?	Yes, 0.004
	Has this value been verified?	Yes. reference provided to IPCC has been checked and confirmed. AMS III.F. also provides the default value.
	Choice of data correctly justified?	Yes.
	Measurement method correctly described?	Not Applicable.
	<b>Data/Parameter title: GWP<sub>CH<sub>4</sub></sub></b>	<b>Comments</b>
	Title in line with methodology?	Global warming potential of methane
	Fixed throughout the crediting period?	Yes
	Data unit correctly expressed?	Yes. tCO <sub>2</sub> e/ tCH <sub>4</sub>
	Appropriate description of parameter?	Yes. Global Warming potential of methane
	Source clearly referenced?	IPCC
	Value provided is considered reasonable?	Yes, 21
	Has this value been verified?	Yes.
	Choice of data correctly justified?	Yes.
	Measurement method correctly described?	Not Applicable

	Data/Parameter title: <b><math>Q_{ww,i,y}</math></b>		Comments
	Title in line with methodology?		Volume of wastewater (POME) treated in year y
	Fixed throughout the crediting period?		No
	Data unit correctly expressed?		Yes. m <sup>3</sup> /month.
	Appropriate description of parameter?		Yes. Volume of waste water POME treated in year y.
	Source clearly referenced?		Yes
	Value provided is considered reasonable?		Yes
	Has this value been verified?		Yes
	Choice of data correctly justified?		Yes
	Measurement method correctly described?		Yes
	Data/Parameter title: <b><math>COD_{y,ww,untreated,y}</math></b>		Comments
	Title in line with methodology?		Chemical Oxygen Demand of wastewater (POME)
	Fixed throughout the crediting period?		No
	Data unit correctly expressed?		Yes, t COD/m <sup>3</sup>
	Appropriate description of parameter?		Yes
			Yes
	Value provided is considered reasonable?		Yes
	Has this value been verified?		Yes
	Choice of data correctly justified?		Yes
	Measurement method correctly described?		Yes
	Data/Parameter title: <b><math>Q_y</math></b>		Comments
	Title in line with methodology?		Quantity of solid waste
	Fixed throughout the crediting period?		No
	Data unit correctly expressed?		Yes
	Appropriate description of parameter?		Yes
	Source clearly referenced?		Yes
	Value provided is considered reasonable?		Yes
	Has this value been verified?		Yes
	Choice of data correctly justified?		Yes
	Measurement method correctly described?		Yes

	Data/Parameter title: <b>Q<sub>v, treatment</sub></b>		Comments
	Title in line with methodology?		Amount of compost produced
	Fixed throughout the crediting period?		No
	Data unit correctly expressed?		Yes
	Appropriate description of parameter?		Yes
	Source clearly referenced?		Yes
	Value provided is considered reasonable?		Yes
	Has this value been verified?		Yes
	Choice of data correctly justified?		Yes
	Measurement method correctly described?		Yes
	Data/Parameter title: <b>CT<sub>v</sub></b>		Comments
	Title in line with methodology?		Average truck capacity for EFB transportation
	Fixed throughout the crediting period?		No
	Data unit correctly expressed?		Yes
	Appropriate description of parameter?		Yes
	Source clearly referenced?		Yes
	Value provided is considered reasonable?		Yes
	Has this value been verified?		Yes
	Choice of data correctly justified?		Yes
	Measurement method correctly described?		Yes
	Data/Parameter title: <b>CT<sub>v, treatment</sub></b>		Comments
	Title in line with methodology?		Average truck capacity for compost transportation
	Fixed throughout the crediting period?		No
	Data unit correctly expressed?		Yes
	Appropriate description of parameter?		Yes
	Source clearly referenced?		Yes
	Value provided is considered reasonable?		Yes
	Has this value been verified?		Yes
	Choice of data correctly justified?		Yes
	Measurement method correctly described?		Yes

	Data/Parameter title: <b>DAF<sub>w</sub></b>		Comments
	Title in line with methodology?		Average incremental distance for raw solid transportation
	Fixed throughout the crediting period?		No
	Data unit correctly expressed?		Yes
	Appropriate description of parameter?		Yes
	Source clearly referenced?		Yes
	Value provided is considered reasonable?		Yes
	Has this value been verified?		Yes
	Choice of data correctly justified?		Yes
	Measurement method correctly described?		Yes
	Data/Parameter title: <b>DAF<sub>treatment</sub></b>		Comments
	Title in line with methodology?		Distance travelled by trucks for transporting compost to be applied in the plantation
	Fixed throughout the crediting period?		No
	Data unit correctly expressed?		Yes
	Appropriate description of parameter?		Yes
	Source clearly referenced?		Yes
	Value provided is considered reasonable?		Yes
	Has this value been verified?		Yes
	Choice of data correctly justified?		Yes
	Measurement method correctly described?		Yes
	Data/Parameter title: <b>FC<sub>diesel, onsite, y(L)</sub></b>		Comments
	Title in line with methodology?		Fuel Consumption onsite (Diesel)
	Fixed throughout the crediting period?		No
	Data unit correctly expressed?		Yes
	Appropriate description of parameter?		Yes
	Source clearly referenced?		Yes
	Value provided is considered reasonable?		Yes
	Has this value been verified?		Yes
	Choice of data correctly justified?		Yes
	Measurement method correctly described?		Yes



	<b>Data/Parameter title: O<sub>2</sub> content</b>		<b>Comments</b>
	Title in line with methodology?		Percentage of dissolved oxygen in composting process
	Fixed throughout the crediting period?	No	
	Data unit correctly expressed?	Yes	
	Appropriate description of parameter?	Yes	
	Source clearly referenced?	Yes	
	Value provided is considered reasonable?	Yes	
	Has this value been verified?	Yes	
	Choice of data correctly justified?	Yes	
	Measurement method correctly described?	Yes	
	<b>Data/Parameter title: fy</b>		<b>Comments</b>
	Title in line with methodology?		Fraction of methane captured at the SWDS and flared, combusted or used in another manner that prevents the emission of methane to the atmosphere in year y
	Fixed throughout the crediting period?	No	
	Data unit correctly expressed?	Yes	
	Appropriate description of parameter?	Yes	
	Source clearly referenced?	Yes	
	Value provided is considered reasonable?	Yes	
	Has this value been verified?	Yes	
	Choice of data correctly justified?	Yes	
	Measurement method correctly described?	Yes	
	<b>Data/Parameter title: DOC<sub>iv</sub></b>		<b>Comments</b>
	Title in line with methodology?		Weight fraction
	Fixed throughout the crediting period?	Yes	
	Data unit correctly expressed?	Yes, no unit	
	Appropriate description of parameter?	Yes	
	Source clearly referenced?	Yes	
	Value provided is considered reasonable?		Literature source has been referred for BMP <sub>i</sub> and DOC <sub>i</sub>

		and equation 11 from the tool, 'Emissions from solid waste disposal sites' is applied.  $\text{DOC}_{f,y} = 0.7 \cdot 12 / 16 \cdot (\text{BMP}_j / F \cdot \text{DOC}_j)$ $= 0.7 \cdot 12 / 16 \cdot \{(0.086) / 0.5 \cdot 0.20\}$ $= 0.4515$																	
	Has this value been verified?	Yes, it matches with that specified in the tool.																	
	Choice of data correctly justified?	No																	
	Measurement method correctly described?	Yes																	
	<table><tr><th>Data/Parameter title: <b>BMP<sub>i</sub></b></th><th>Comments</th></tr><tr><td>Title in line with methodology?</td><td>Biochemical methane potential (BMP) of residual waste type j disposed or prevented from disposal</td></tr><tr><td>Fixed throughout the crediting period?</td><td>Yes</td></tr><tr><td>Data unit correctly expressed?</td><td>Yes</td></tr><tr><td>Appropriate description of parameter?</td><td>Yes</td></tr><tr><td>Source clearly referenced?</td><td>Yes</td></tr><tr><td>Value provided is considered reasonable?</td><td>Yes</td></tr><tr><td>Has this value been verified?</td><td>The PDD refers that for ex-ante calculations, BMP has been calculated based on the research paper "Bio-Methane Potential of Biological Materials and agricultural Wastes", published in Asian Journal on Biochemical Methane Potential of methane per tonne of FFB has been calculated as</td></tr></table>		Data/Parameter title: <b>BMP<sub>i</sub></b>	Comments	Title in line with methodology?	Biochemical methane potential (BMP) of residual waste type j disposed or prevented from disposal	Fixed throughout the crediting period?	Yes	Data unit correctly expressed?	Yes	Appropriate description of parameter?	Yes	Source clearly referenced?	Yes	Value provided is considered reasonable?	Yes	Has this value been verified?	The PDD refers that for ex-ante calculations, BMP has been calculated based on the research paper "Bio-Methane Potential of Biological Materials and agricultural Wastes", published in Asian Journal on Biochemical Methane Potential of methane per tonne of FFB has been calculated as	
	Data/Parameter title: <b>BMP<sub>i</sub></b>	Comments																	
	Title in line with methodology?	Biochemical methane potential (BMP) of residual waste type j disposed or prevented from disposal																	
	Fixed throughout the crediting period?	Yes																	
	Data unit correctly expressed?	Yes																	
	Appropriate description of parameter?	Yes																	
Source clearly referenced?	Yes																		
Value provided is considered reasonable?	Yes																		
Has this value been verified?	The PDD refers that for ex-ante calculations, BMP has been calculated based on the research paper "Bio-Methane Potential of Biological Materials and agricultural Wastes", published in Asian Journal on Biochemical Methane Potential of methane per tonne of FFB has been calculated as																		

		<p>under:  Solid Content of EFB*  Volume of solids on dry basis* Ultimate methane yield of EFB* Density of methane  i.e. 0.35 t DS/t EFB * 0.925 t VS/t DS*370m<sup>3</sup>/t VS * 0.0007168 t/m<sup>3</sup>  = 0.086tCH<sub>4</sub>/t EFB</p> <p>Verification:  Referred Asian Journal of Energy and Environment, 2009, 10(01)  <a href="http://www.asian-energy-journal.info/Abstract/Bio-methane%20potential%20of%20biological%20solid%20materials%20and%20agricultural%20wastes.pdf">http://www.asian-energy-journal.info/Abstract/Bio-methane%20potential%20of%20biological%20solid%20materials%20and%20agricultural%20wastes.pdf</a>  and confirmed following:  Moisture content in EFB – 65.7%  Vol of solids – 92.5%  Ultimate methane yield at 90 days = 0.37 l/g  Density of methane at STP confirmed as 0.717 kg/m<sup>3</sup>.  Ref:  <a href="http://www.engineeringtoolbox.com/gas-density-d_158.html">http://www.engineeringtoolbox.com/gas-density-d_158.html</a></p>	
	Choice of data correctly justified?	Yes	
	Measurement method correctly described?	Yes	

3. Confirm that all assumptions and data used by PPs are listed in the PDD including their references and sources, and that the documentation used as the basis for these assumptions and source of data is correctly quoted and interpreted in the PDD.	Yes.	OK
4. Confirm that all estimates of the baseline emissions can be replicated using the data and parameter values provided in the PDD.	Yes	OK

	Validated situation	Conclusion
<b>SECTION 6. Additionality of a project activity</b>		
1. Does the PDD clearly describe how the proposed CDM project activity is additional?	Yes <input checked="" type="checkbox"/> No <input type="checkbox"/>	OK
2. List the documents and tools provided by the CDM Executive Board used to demonstrate the additionality	<ol style="list-style-type: none"> <li>1. Attachment A to Appendix B of the simplified Modalities and Procedures for small-scale CDM project activities</li> <li>2. Guidelines on the Assessment Of Investment Analysis Version 05.0</li> <li>3. Guidelines on the Demonstration And Assessment of Prior Consideration of the CDM, Version 04</li> </ol>	OK

	Validated situation	Conclusion
SECTION 6a. Prior consideration of the clean development mechanism		
1. Does the PDD clearly indicate the start date of the project activity in format: dd/mm/yyyy and it is in line with the Glossary of CDM Terms?	<p>Yes <input checked="" type="checkbox"/> No <input type="checkbox"/></p> <p>The start date of the project activity was mentioned as 01/12/2008. However, a contract dated 13/11/2007 was noted issued to Harcos Construction Sdn. Bhd. CAR 06 was raised on this issue and the PP revised the PDD to reflect start date as 13/11/2007.</p> <p>The validation team confirmed that the contract agreement with Harcos Construction Sdn Bhd. represents the earliest of early actions and therefore accepted the revised date. It was also confirmed that the management decision for the project activity to be considered as CDM was evidence through management minutes of 20<sup>th</sup> May 2007. The start date was after serious decision making. CAR 06 was therefore closed out.</p>	<p>CAR 06</p> <p>Closed</p> <p>OK</p>
If the PDD was published for Global Stakeholder Consultation process after the start date, check that the CDM benefits were considered necessary in the decision to undertake the project activity as a CDM project, following the below queries.		
2. For a project activity with a start date on or after the 02 August 2008, confirm that the PPs have informed the host party DNA and the UNFCCC secretariat in writing of their intention to seek CDM Status.	Not Applicable, since the start date was before 2 <sup>nd</sup> Aug 2008	OK
If such a notification has not been provided by the PPs within six months of the project activity start date, determine that the CDM was not seriously considered in the decision to implement the project activity.		

	Validated situation	Conclusion
<p>3. For a project activity with a start date before 02 August 2008, check the following requirements through document reviews to assess the PPs prior consideration of the CDM:</p> <p>(a) Evidence that must indicate that awareness of the CDM before the project activity start date, and that the benefits of the CDM were a decisive factor in the decision to proceed with the project.</p> <p>(b) Reliable evidence from project participants that must indicate that continuing and real actions were taken to secure CDM status for the project in parallel with its implementation.</p> <p>The time gap between the documented evidence of prior CDM consideration and continuing and real actions shall be within the period required by the Guidance on prior consideration of the CDM</p> <p>If evidence to support the serious prior consideration of the CDM as indicated above that is authentic is not available, determine that the CDM was not considered in the decision to implement the project activity.</p>	<p>Mr. M. C. Wong, Hi Tech Activated Carbon was interviewed who confirmed his understanding on CDM owing to a conference that he attended.</p> <p>Minutes of the board meeting signed by Mr. Wong and Mr. Tee Yee Peng dated 08<sup>th</sup> May 2007 were available which asked to hire a consultant to determine whether the project can be considered as a CDM project. Meeting minutes held on 20<sup>th</sup> May 2007 considers that the cost of the composting facility being RM 3.2 million based on a quotation presented by Harcos Construction Sdn. Bhd, The validation team confirmed the authenticity of the minutes since they were certified by the Company Secretary in accordance with the host country requirements. The minutes note that the project can cross the financial barrier only after consideration of CDM funds.</p> <p>The publication of the PDD on UNFCCC was on 01 Dec 2007, which is just a month after the start date, confirms that the PP has taken continuing and real actions towards securing CDM status.</p>	OK

		Validated situation	Conclusion
<b>SECTION 6b. Identification of alternatives</b>			
<p>1. Does the PDD identify credible alternatives to the project activity, to determine the most realistic baseline scenario?</p> <p>Assess this list of alternatives and ensure that:</p> <p>(a) The list of alternatives includes as one of the options that the project activity is undertaken without being registered as a proposed CDM project activity.</p> <p>(b) The list contains all plausible alternatives considered to be viable means of supplying the outputs or services that are to be supplied by the proposed CDM project activity.</p> <p>(c) The alternatives comply with all applicable and enforced legislation.</p>	LIST OF ALTERNATIVES		OK
	No	Description in the PDD	
		The baseline scenario is the situation where, in the absence of the project activity, biomass and other organic matter are left to decay within the project boundary and methane is emitted to the atmosphere	



	Validated situation	Conclusion								
SECTION 6c. Investment analysis										
1. Verify the accuracy of financial calculations carried out for the investment analysis: (a) Conduct a thorough assessment of all parameters and assumptions used in calculating the relevant financial indicator, and determine the accuracy and suitability of these parameters. (b) Cross-check the parameters against third-party or publicly available sources, such as invoices or price indices. (c) Review feasibility reports, public announcements and annual financial reports related to the proposed CDM project activity and the project participants.	<p>The PP has submitted a spreadsheet that calculates the pre-tax IRR of the project activity.</p> <ol style="list-style-type: none"><li>1. A 5% residual cost of equipment has been considered at the end of the project activity.</li><li>2. A pre-tax IRR has been calculated and therefore depreciation is not considered.</li><li>3. Since the project is funded by equity, there are no interest payments to account for within the investment analysis.</li><li>4. Assessment considers the complete 20 year lifetime of the period activity.</li></ol> <p>A cross-check of financial parameters was undertaken. Please refer table below.</p> <p>CAR 07 was issued since evidence to support financial equipment costs was not provided. Also, the period of assessment considered was only 5 years while the crediting period is for 10 years and the project lifetime 20 years.</p> <p>The PP submitted evidence to support the equipment costs and a revised spreadsheet which accounted for an assessment period of 20 years. The finding was therefore closed.</p>	<del>CAR 07</del> Closed OK								
2. Assess the correctness of computations carried out and documented by the project participants	The calculations were assessed against the Guidelines on the Assessment of Investment Analysis and noted to be correct.	OK								
3. Assess the sensitivity analysis by the project participants to determine under what conditions variations in the result would occur, and the likelihood of these conditions.	<p>A sensitivity analysis on total project cost, O&amp;M and compost cost was conducted for a 10% variation and presented in the PDD.</p> <table><tr><th>Variable subject to sensitivity</th><th>At Year 20 from project start</th></tr><tr><td>Compost price + 10%</td><td>3.90%</td></tr><tr><td>O&amp;M cost - 10%</td><td>3.19%</td></tr><tr><td>CAPEX - 10%</td><td>-4.47%</td></tr></table>	Variable subject to sensitivity	At Year 20 from project start	Compost price + 10%	3.90%	O&M cost - 10%	3.19%	CAPEX - 10%	-4.47%	OK
Variable subject to sensitivity	At Year 20 from project start									
Compost price + 10%	3.90%									
O&M cost - 10%	3.19%									
CAPEX - 10%	-4.47%									

	Validated situation	Conclusion																																
	<p>In order to achieve equity IRR of 15%</p> <table><tr><th>Variable subject to sensitivity</th><th>Increase/ decrease to cross the benchmark</th></tr><tr><td>Compost price</td><td>+30.0%</td></tr><tr><td>O&amp;M cost</td><td>-30.5%</td></tr><tr><td>CAPEX</td><td>-92.5%</td></tr></table> <p>O&amp;M Cost – The O&amp;M Costs considered in the investment analysis have been based on the quotation by Unique Nutrients Sdn. Bhd. dated 08 May 2007.</p> <table><tr><th></th><th>As per Quote (Phase I)</th><th>Actual in Year 2009</th></tr><tr><td>Microbes</td><td>60,000</td><td>60,000</td></tr><tr><td>Diesel</td><td>62,060</td><td>47,981</td></tr><tr><td>Maintenance - Backhoes</td><td>10,000</td><td>13,406</td></tr><tr><td>Maintenance - Tractors and Trawlers</td><td>140,000</td><td>144,594</td></tr><tr><td>Office Expense</td><td>60,000</td><td>50,940</td></tr><tr><td>Total</td><td>332,060</td><td>316,921</td></tr><tr><td></td><td>Difference</td><td>4.56%</td></tr></table> <p>The salary costs and the cost of EFB remain the same and therefore the reduction will be less than 4.56%. To consider a 30.5% decrease in overall O&amp;M costs is highly improbable with a generally increasing trend of inflation of the host country.</p> <p>Compost price is based on a purchase agreement with the Tee The Palm Oil plantations. The team's sector expert has concurred the compost price to be reasonable. Comparison with other</p>	Variable subject to sensitivity	Increase/ decrease to cross the benchmark	Compost price	+30.0%	O&M cost	-30.5%	CAPEX	-92.5%		As per Quote (Phase I)	Actual in Year 2009	Microbes	60,000	60,000	Diesel	62,060	47,981	Maintenance - Backhoes	10,000	13,406	Maintenance - Tractors and Trawlers	140,000	144,594	Office Expense	60,000	50,940	Total	332,060	316,921		Difference	4.56%	
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Total	332,060	316,921																																
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	Validated situation	Conclusion
	<p>similar registered projects (3379, 3154, 3221 and 2727) shows that compost price considered is in the range of RM 51 to 102/ tonne. The cost of RM100 per tonne of compost considered is therefore reasonable and a higher price of 30% is not reasonable.</p> <p>Capital Expenditure - this cost has already been incurred and the costs of all equipment were verified with invoiced cost by the construction company. In addition, considering the unit investment cost per tonne of FFB processing, the project's cost at RM 16.73 /tonne is the lowest compared to other similar registered projects. It is therefore unlikely that the project cost would reduce further.</p>	

Use the table below to list all the inputs to the investment analysis and to describe how each parameter has been validated:

	Phase I	Phase II	Validation/Justification	Conclusion												
Maximum Fresh Fruit Bunch (FFB) processed	72,000	162,000	<div>Phase I: 20 t/h x 12 hr/day x 300 days = 72,000 tonnes</div> <table><tr><th>Year</th><th>Total FFB Processed (tonnes/year)</th><th>Mill capacity (tonnes/hr)</th><th>Operating hours/ year</th></tr><tr><td>2007</td><td>70,344</td><td>20</td><td>3,517</td></tr><tr><td>2008</td><td>72,642</td><td>20</td><td>3,632</td></tr></table> <div>The monthly FFB processing records for the year 2007 and 2008 were reviewed by the validation team and summarised for the year as above. The average processing works out to 71,493 tonnes and therefore 72,000 tonnes for Phase I was considered appropriate.</div> <div>It may be noted that the investment decision on the project activity was taken on May 20, 2007.</div> <div>The mill had been operating at 20 tonne per hour (t/h) since 1982 and the</div>	Year	Total FFB Processed (tonnes/year)	Mill capacity (tonnes/hr)	Operating hours/ year	2007	70,344	20	3,517	2008	72,642	20	3,632	OK
Year	Total FFB Processed (tonnes/year)	Mill capacity (tonnes/hr)	Operating hours/ year													
2007	70,344	20	3,517													
2008	72,642	20	3,632													

	Phase I	Phase II	Validation/Justification	Conclusion																
			<p>expansion of the mill to 45 t/h was undertaken in 2008. The mill operates for an average of 300 days per year (considering 52 weekly holidays and 11 days of public holiday and 2 optional holidays, 300 days of operation considered reasonable) for an average of 12 hours per day (as confirmed from the operational records).</p> <p>Phase 2: 14 Oct 2007 letter by Tee Teh Sdn Bhd to Hi-Tech advising of capacity expansion from 20 t/h to 45 t/h. The operating hours per day and days per annum of the plant was projected based on the Phase I, which was 12 hrs per day and 300 days per annum (365 days – 52 weekly holidays – 11 public – 2 optional holidays = 300 days), this was confirmed via the historical monthly FFB processing record for year 2007 &amp; 2008.</p> <p>The validation team confirmed the capacity of the milling plant to be 45 t/h from the license to the mill issued by the Department of Environment and the 12 hours per day average has been confirmed as the average operating hours at the mill by the Senior Mill Manager, Teo Gan Sun, Tee Teh Sdn Bhd.</p> <p>45 t/h x 12 hr x 300 days = 162,000 tonnes.</p>																	
Wastewater [Palm Oil Mill Effluent (POME)] generation/FFB production	0.79	0.79	<p>The validation team reviewed the records of FFB processed and POME generated for the years 2007, 2008 and 2009 as summarised below:</p> <table><tr><th>Year</th><th>FFB processed (tonnes)</th><th>POME (m<sup>3</sup>)</th><th>POME/ FFB</th></tr><tr><td>2007</td><td>70,344</td><td>72,748</td><td>1.03</td></tr><tr><td>2008</td><td>72,642</td><td>74,821</td><td>1.03</td></tr><tr><td>2009</td><td>79,670</td><td>62,758</td><td>0.79</td></tr></table> <p>And selected the most conservative of these, which was 0.79 for the year 2009.</p> <p>The POME COD value is available only for year 2009. No records of POME COD prior to these were available. The COD loading for a process will</p>	Year	FFB processed (tonnes)	POME (m <sup>3</sup> )	POME/ FFB	2007	70,344	72,748	1.03	2008	72,642	74,821	1.03	2009	79,670	62,758	0.79	OK
Year	FFB processed (tonnes)	POME (m <sup>3</sup> )	POME/ FFB																	
2007	70,344	72,748	1.03																	
2008	72,642	74,821	1.03																	
2009	79,670	62,758	0.79																	

	Phase I	Phase II	Validation/Justification	Conclusion
			<p>remain the same, so it is expected that with higher POME generation in years 2007 and 2008, the POME COD value was less than 75.392 kg/m<sup>3</sup>. For ex-ante calculation, the use of POME/FFB generation and POME COD for year 2009 is considered appropriate.</p> <p>In addition, the sector expert to the team has concluded that the ratio adopted is justified.</p> <p>Validation opinion – Correct on basis of historical records</p>	
POME Flowrate	56,716	127,611	<p>Phase I: <math>72000 \times 0.79 = 56,716 \text{ m}^3</math>.</p> <p>Phase 2: <math>162,000 \times 0.79 = 127,611 \text{ m}^3</math>.</p> <p>Validation opinion – correctly calculated.</p>	OK
POME COD	75.392	75.392	<p>Daily Average COD based on data for 28/10/2009 to 31/10/2009 from Lotus Laboratory report dated 4<sup>th</sup> Nov 2009.</p> <p>The validation team confirmed the appropriateness through sampled test report in November 2007</p> <p>Through sectoral expertise, the validation team concluded that the COD data on 27/10/2009 was not representative resulting possibly due to variations in operations in the mill and therefore excluded this data.</p> <p>The average COD of 75.392 mg/l is considered appropriate.</p> <p>In addition, as stated earlier, the POME COD value is available only for year 2009. No records of POME COD prior to these were available. The COD loading for a process will remain the same, so it is expected that with higher POME generation in years 2007 and 2008, the POME COD value was lesser than 75.392 kg/m<sup>3</sup>. For ex-ante calculation, the use of POME/FFB generation and POME COD for year 2009 is considered appropriate.</p>	OK
EFB Produced (wet basis)	16,560	37,260	23% of FFB based on Literature source: Chiew Yoon Lin Depart. Environment System “Study on Effective Utilization of Palm Oil Waste (Empty Fruit Bunch) System in Malaysia”	OK

	Phase I	Phase II	Validation/Justification	Conclusion
			<p>Phase I: = <math>0.23 \times 72,000 = 16,560</math></p> <p>Phase 2: = <math>0.23 \times 16,200 = 37,260</math></p>	
Compost per tonne EFB	0.4	0.4	<p>The proposal dated 18/05/2007 estimates that 14,085 t compost will be generated for a yearly processing of 37,065 t FFB. This works out to 0.38 t compost per tonne EFB. Considering 95% efficiency, this is equal to 0.36.</p> <p>The value of compost at 0.4 t/ t of EFB is therefore conservative (since this yields revenue).</p> <p>In addition, the ratio of compost / tonne of EFB was confirmed with the team's sector expert.</p>	OK
Compost generated per year (tonne/year)	6,624	14,904	<p>Phase I = <math>0.4 \times 16,560 = 6,624</math> tonnes</p> <p>Phase 2 = <math>0.4 \times 37,260 = 14,904</math> tonnes</p>	OK

Parameter/input	Symbol/Unit	Value	Source	Means of validation	Conclusion
Investment Cost (refer to table below)	RM	2,764,300	Individual invoices of equipment and construction costs were presented which total RM 2,764,300	<p>The Minutes of the meeting dated 20 May 2007 shows that the total investment cost is RM 3.2 million. The validation team asked for supporting evidence to establish this cost.</p> <p>Individual invoices of vehicles and heavy equipment were sighted which total RM 2,764,300.</p> <p>A quotation from Harcos Construction Sdn Bhd. dated 12 Nov 2007 for total investment of RM 2,725,000. However, during validation, the actual costs were noted to be RM 2,764,300 + RM 44,300 (agricultural tractor previously purchased) + RM 65,000 (2 used drum truck lorries) – 70,000 (reconditioned trailer which was initially considered but not purchased). Please see the table below for break-up of individual items that constitute this investment cost.</p>	OK

				The investment cost works out to 16.81 RM/t FFB which is conservative when compared with other registered CDM projects. For example CDM project (ref 3154) has 32.68 RM/t FFB.	
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Break-down of individual equipment	Costs (RM)	Means of validation
a) Ford	44,300	1. Quotation by Ban Huat Machinery 2. Invoice for RM 44,300 by Besteel Berhad dated 18/03/2008
b) 2 Drum Truck Lorry	65,000	1. Quotation by Harcos Construction Sdn.Bhd. dated 12 November 2007 2. Unique Nutrients Sdn Bhd Invoice dated 13/03/2008
c) Recon Tipper Truck	65,000	1. Quotation by Harcos Construction Sdn.Bhd. dated 12 November 2007
d) Recon backhoe loader	165,000	1. Quotation by Harcos Construction Sdn.Bhd. dated 12 November 2007 2. Unique Nutrients Sdn Bhd Invoice dated 10/04/2008
e) Tractor (for pulling turner)	220,000	1. Quotation by Harcos Construction Sdn.Bhd. dated 12 November 2007 1. Unique Nutrients Sdn Bhd invoice dated 25/03/2008
<u>Earthwork</u>		
a) Composting area	300,000	1. Quotation by Harcos Construction Sdn.Bhd. dated 12 November 2007 2. Invoice raised by Harcos Construction Sdn Bhd to Hi Tech Activated Carbon Sdn Bhd dated 10 July 2008
b) Storm retention pond	190,000	1. Quotation by Harcos Construction Sdn.Bhd. dated 12 November 2007 2. Invoice raised by Harcos Construction Sdn Bhd to Hi Tech Activated Carbon Sdn Bhd dated 10 July 2008
High Speed Shredder	250,000	2. Quotation by Harcos Construction Sdn.Bhd. dated 12 November 2007 3. Unique Nutrients Sdn Bhd invoice dated 18/03/2008
Windrow Turner	320,000	1. Quotation by Harcos Construction Sdn.Bhd. dated 12 November 2007 2. Unique Nutrients Sdn Bhd invoice dated 14/05/2008

Composting Cover	150,000	<ol style="list-style-type: none"> <li>1. Quotation by Harcos Construction Sdn.Bhd. dated 12 November 2007</li> <li>2. Unique Nutrients Sdn Bhd invoice dated 11/06/2008</li> </ol>
Erection Shredding Station	380,000	<ol style="list-style-type: none"> <li>1. Refer to Quotation by Harcos Construction Sdn.Bhd. dated 12 November 2007</li> <li>2. Unique Nutrients Sdn Bhd invoice dated 18/03/2008</li> </ol>
RC Drain (Pipe Culvert & Piling)	245,000	<ol style="list-style-type: none"> <li>1. Quotation by Harcos Construction Sdn.Bhd. dated 12 November 2007</li> <li>2. Invoice raised by Harcos Construction Sdn Bhd to Hi Tech Activated Carbon Sdn Bhd dated 10 July 2008</li> </ol>
Project Management and Consultation Fees	350,000	<ol style="list-style-type: none"> <li>1. Quotation by Harcos Construction Sdn.Bhd. dated 12 November 2007</li> <li>2. Invoice raised by Harcos Construction Sdn Bhd to Hi Tech Activated Carbon Sdn Bhd dated 10 July 2008</li> </ol>
Training fees	20,000	<ol style="list-style-type: none"> <li>1. Quotation by Harcos Construction Sdn.Bhd. dated 12 November 2007</li> <li>2. Invoice raised by Harcos Construction Sdn Bhd to Hi Tech Activated Carbon Sdn Bhd dated 10 July 2008</li> </ol>

Parameter/input	Symbol/Unit	Value	Source	Means of validation	Conclusion
Annual Labour cost	RM	360,000	<p>Total of 19 people to be employed which includes Manager, Assistants, general workers, etc. and the total cost of pay is RM 25,000 per month. Plus cost of administration such as office space of RM 5,000 per month.</p> <p>Yearly cost is therefore 360,000.</p> <p>The number of staff remains the same for Phase I and</p>	<p>This works out to 5.98 RM/t FFB</p> <p>A project comparison analysis shows that O&amp;M cost/t FFB varies from 2.17RM/t (ref 2492) to 8.86 RM/t (ref 3154).</p> <p>On the basis of discussion with the PP, the validation team (through host country competence) established that consideration of RM 25,000 / month as labor cost is conservative since it considers all legislative levy, retirement fund contribution and monthly salary for employment to all human resource required for effective project implementation.</p>	OK



Parameter/input	Symbol/Unit	Value	Source	Means of validation	Conclusion
			Phase 2.	The breakdown for office and administration cost was presented by the project proponent, which includes: subscription to fixed line phones, mobile phones, internet, office stationeries, rental of photocopy machine, water, and other miscellaneous claim. All work out to be RM 4,254 per month and PP has rounded up to estimation of RM 5,000. The validation team agreed that the figure used is reasonable.	
Annual Operation & Maintenance Cost	RM	Phase I 432,850  Phase 2 968,411	A break-up of cost of EFB, microbe, equipment maintenance and fuel has been provided based on distance travelled.	The validation team confirmed the following costs: The O&M costs for the year 2009 (Phase I) shows a total cost of RM 316,921 which does not include cost of EFB.  When costs of EFB are added, this works out to RM 482,521 which is 11.4% higher than that considered at investment decision.  Through discussions with the PP, it was understood that the expansion of the Palm oil mill is not yet complete; as a result Phase II of the project activity has not commenced.	OK
Land Rental		88,000	14 June 2007 Agreement for land rental between Tee Teh Palm Oil Mill Sdn Bhd. And Hi Tech Activated Carbon Sdn Bhd. For 14 acre of land at RM 208 per acre per month. This works to $14 \times 208 \times 12 = \text{RM } 34,944$ per annum.  30 Oct 2007 Letter from	Discussions with the PP revealed that initially 14 acres was deemed sufficient, but, in Oct 2007, they agreed to lease 22 acres. The rate per acre per annum agreed is RM 4000 instead of RM 2496 per annum agreed previously.  Even if a conservative estimate of RM 2496 per acre is considered, i.e. RM 54,912, it does not affect the additionality of the project activity.	OK

Parameter/input	Symbol/Unit	Value	Source	Means of validation	Conclusion
			Harcos agrees to rent 22 acres at a cost of RM 4000 per annum. This works out to RM 88,000/- per annum.		
Compost sale price		100	Agreement between Hi-Tech Activated Carbon Sdn Bhd and Tee Teh Sdn Bhd in their meeting on 18 <sup>th</sup> Oct 2007 as presented in a letter from Hi-Tech Activated Carbon Sdn Bhd. Letter dated 30 Oct 2007.	Review of other registered CDM projects shown that compost price ranges from 50 RM/t (project ref 4841) to 90 RM/t (project ref 3916). Since compost is a revenue stream, a sale price of 100 is therefore conservative	OK
EFB purchase price	RM/tonne	RM10 for Phase I &  RM15 for Phase 2	<p>Agreement between Hi-Tech Activated Carbon Sdn Bhd and Tee Teh Sdn Bhd in their meeting on 18<sup>th</sup> Oct 2007 as presented in a letter from Hi-Tech Activated Carbon Sdn Bhd. Letter dated 30 Oct 2007 which states cost of compost for Phase I – RM 10/tonne</p> <p>Agreement between Hi-Tech Activated Carbon Sdn Bhd and Tee Teh Sdn Bhd in their meeting on 18<sup>th</sup> Oct 2007 as presented in a letter from Hi-Tech Activated Carbon Sdn Bhd. Letter dated 30 Nov 2007 which states cost of compost for Phase I – RM 15/tonne</p>	<p>According to the PP, the Tee Teh Palm Oil mill saves the transportation cost to the dump site and therefore nominal cost to support this is appropriate.</p> <p>For Phase 2, the cost is more because it is to be generated subsequently after the expansion of the palm oil mill from 20 t/h to 45 t/h.</p>	OK

Parameter/input	Symbol/Unit	Value	Source	Means of validation	Conclusion
Microbe (Trichoderma) price	RM/kilo	40	Unique Nutrients Sdn. Bhd.	Confirmed from a quotation from Unique Nutrients Sdn Bhd. dated 08 May 2007.	OK
Residual value	RM	138,215	5% of initial investment	<p>At the end of the contract, the ownership of the co-composting facility would be transferred to the mill owner at agreed residual value of 5% of the CAPEX. An agreement to take over the facility with this rate was reviewed.</p> <p>5% is conservative and reasonable considering that a large part of investment includes heavy equipment which will not fetch any value after use. Most registered projects have not considered any salvage value at the end of project life since the removal of scrap will cost more (ref project 3916).</p>	OK

	Validated situation	Conclusion
<p>4. Confirm the suitability of any benchmark applied in the investment analysis:</p> <p>(a) Determine whether the type of benchmark applied is suitable for the type of financial indicator presented.</p> <p>(b) Ensure that any risk premiums applied in determining the benchmark reflect the risks associated with the project type or activity.</p> <p>(c) Determine whether it is reasonable to assume that no investment would be made at a rate of return lower than the benchmark by, for example, assessing previous investment decisions by the project participants involved and determining whether the same benchmark has been applied or if there are verifiable circumstances that have led to a change in the benchmark.</p>	<p>The PDD has referenced the 15% benchmark quoted in a Study on CDM potential in waste sector in Malaysia” done by Eco-Ideal in 2004 for the wastes generated in the palm oil mill sector. The PP had selected a benchmark of 15% as supported by the study done by Eco-Ideal (2004). The reference report titled, “Study on Clean Development Mechanism Potential in the Waste Sectors in Malaysia” has been prepared by the Ministry of Energy, Water and Communications in collaboration with DANIDA in December 2004 establishes that the projects in the palm oil sector In Malaysia need 15% minimum return on equity. The validation team confirms the appropriateness of the benchmark in view that it has been published by Eco-Ideal Consulting Sdn. Bhd. DANIDA and Pusat Tenaga Malaysia (PTM) for both project and equity IRR type investments in the waste sectors. This benchmark has also been referenced in CDM registered projects reference 2181, 2185 and 3221.</p> <p>A 15% benchmark is also adopted in the following literature source:</p> <p>“An assessment of potential and availability of palm biomass for bioconversion to bioethanol”, a report prepared under the Malaysian - Danish Environmental Cooperation Programme Renewable Energy and Energy Efficiency Component by Chow Mee Chin. This benchmark is therefore suitable for use as a pre-tax benchmark for the project activity.</p> <p>Paragraph 12 of the Guidelines on the assessment of investment analysis (Annex 5 to EB62) states that “Required/expected returns on equity are appropriate benchmarks for equity IRR”.</p> <p>The validation team has cross-checked the return on equity available as per option (a) of the Paragraph 15 of the Guidelines on the Assessment of Investment Analysis. i.e. by choosing the default values for the expected return on equity provided in Appendix to the Guidelines. The real term value provided in the referred Appendix is converted into nominal value as follows:</p> $ROE_{\text{Nominal}} = (1 + ROE_{\text{Real}}) * (1 + \text{Inf}) - 1$ <p>( Refer- <a href="http://en.wikipedia.org/wiki/Fisher_equation">http://en.wikipedia.org/wiki/Fisher_equation</a> )</p> <p>Where</p> <p><math>ROE_{\text{Nominal}}</math> - Expected return on equity on nominal basis</p> <p><math>ROE_{\text{Real}}</math> - Expected return on equity on real basis</p> <p>Inf - Average inflation rate</p>	OK

	Validated situation	Conclusion
	$\%RoE_{\text{Nominal}} = [(1+10.9\%)(1+2.4\%)-1]$ $= 13.56\%$ <p>Inf - The average inflation rate in 2007 as per central bank of Malaysia was 2.4%, which is used in absence of data on inflation forecast for the crediting period i.e 10 years.</p> <p>The equity IRR of the project being negative, any benchmark is inconsequential.</p>	
<p>5. In case the project participants rely on values from a Feasibility Study Report (FSR) approved by any national authority, the team is required to ensure that:</p> <p>(a) The FSR has been the basis of the decision to proceed with the investment in the project, i.e. that the period of time between the finalization of the FSR and the investment decision is sufficiently short for the DOE to confirm that it is unlikely in the context of the underlying project activity that the input values would have materially changed.</p> <p>(b) The values used in the PDD and associated annexes are fully consistent with the FSR and, where inconsistencies occur, the DOE should validate the appropriateness of the values.</p> <p>(c) On the basis of its specific local and sectoral expertise, confirmation is provided, by cross-checking or other appropriate manner, that the input values from the FSR are valid and applicable at the time of the investment decision.</p> <p>Use the table below to cross-check input values and describe here the results of the comparison.</p>	The values from the quotation issued by the supplier were validated against actual costs.	OK

		Validated situation	Conclusion		
SECTION 6d. Barrier analysis					
1. Does the PDD demonstrate that the proposed project activity faces barriers that prevent its implementation and do not prevent at least the implementation of one of the alternatives? Provide here an overall determination of the credibility of the barrier analysis. Use the below table to list each barrier considered in the PDD and to describe how the team undertake their validation.		The PDD version 1.1 dated 11/11/2007 included a description on barrier analysis. Technological barrier and Barrier due to prevailing practice were presented. CAR09 was raised by the validation team asking the PP to justify the barriers in accordance with the Guidelines on the objective demonstration and assessment of barriers, EB 50 Annex 13.  As a result, the PP decided to remove the barrier from the PDD. CAR 09 was therefore closed.	CAR09 Closed OK		
Barriers are issues in project implementation that could prevent a potential investor from pursuing the implementation of the proposed project activity. The identified barriers are only sufficient grounds for demonstration of additionality if they would prevent potential project proponents from carrying out the proposed project activity undertaken without being registered as a CDM project activity.					
Type of Barrier	Description in the PDD	Determination			Conclusion
		Barriers are real	Prevent implementation of PA	Do not prevent implementation of BL	
Access to finance					
Risks related barriers					
Technological	The composting technology is developed in USA. It uses a mechanical turner that ensures aeration of the EFB to enhance the composting process. Also, the windrows cover sheets from Denmark are specifically designed to allow rainwater runoff and hence minimize leaching from the EFB under composting. The permeable cover allows free flow of air for composting activities.	CAR 09 was raised asking the PP to demonstrate barriers in accordance with the Guidelines on the objective demonstration and assessment of barriers, EB 50 Annex 13.  As a result, the PP decided to remove the barrier from the PDD.			CAR09 Closed  OK

		Validated situation			Conclusion
	This approach is significantly different from the traditional mulching or dumping of waste. The import of this new technology and usage of specific microbes is considered to be a risky investment by the project developer. “	CAR 09 was therefore closed.			
Due to prevailing practice	There are some 400 palm oil mills in Malaysia. Most common practices are disposal of EFB at landfill and anaerobic treatment of POME in pond. The co-composting is a new practice that will reduce the emission of methane emission from the palm oil waste and produce nutrient supplement that could be applied to the palm oil plantation. Such application will also reduce the consumption of chemical fertilizers.	<p>CAR 09 was raised asking the PP to demonstrate barriers in accordance with the Guidelines on the objective demonstration and assessment of barriers, EB 50 Annex 13.</p> <p>As a result, the PP decided to remove the barrier from the PDD.</p> <p>CAR 09 was therefore closed.</p>			<p><del>CAR09</del> Closed</p> <p>OK</p>
Other	N/A				
First of its kind	N/A				

	Validated situation	Conclusion
<b>SECTION 6e. Common practice analysis</b>		
1. Describe how the geographical scope of the common practice analysis has been validated. Assess whether the geographical scope (for example, the defined region) of the common practice analysis is appropriate for the assessment of common practice related to the project activity's technology or industry type.	Not applicable. The project is categorised as small scale project activity and hence, common practice analysis is not required.	NA
2. Determine to what extent similar and operational projects (for example, using similar technology or practice), other than CDM project activities, have been undertaken in the defined region.	Not applicable	NA
3. If similar and operational projects, other than CDM project activities, are already widely observed and commonly carried out in the defined region, assess whether there are essential distinctions between the proposed CDM project activity and the other similar activities.	Not applicable	NA



			Validated situation	Conclusion												
SECTION 7. Monitoring plan																
1. <i>Compliance of the monitoring plan with the approved methodology.</i> Confirm that the MP contains all the necessary parameters and that they are monitored in accordance to the approve Methodology using the following table:																
Parameter	Monitoring Methodology description	PDD description	Validated situation	Conclusion												
			CAR05 was initially issued since the parameters were not in accordance with the methodology.  The PP corrected the relevant parameters which were validated and therefore the CAR 05 was closed out.	<del>CAR 05</del> Closed OK												
Q <sub>y</sub> ,	Quantity of solid waste (excluding manure), produced compost	Quantity of EFB composted in the project activity	<table><tr><td></td><td>Monitoring Methodology description</td><td>PDD description</td></tr><tr><td>Unit</td><td>tonnes</td><td>tonnes</td></tr><tr><td>Monitoring/ recording Frequency</td><td>Monthly</td><td>On-site data sheets recorded monthly using weighbridge. Data will be recorded at least monthly with annual aggregation</td></tr><tr><td>Measurement Methods and Procedures</td><td>On-site data sheets recorded monthly using weigh bridge. Weighbridge will be subject to periodic calibration (in accordance with stipulation of the weighbridge supplier), also cross check with sales of compost</td><td>Trucks assigned for EFB transportation from mill to compost plant will be weighed at the mill using the weighbridge.  The weighbridge will be maintained as per manufacturer / supplier's recommendations and calibrated at least once in 3 years.</td></tr></table>		Monitoring Methodology description	PDD description	Unit	tonnes	tonnes	Monitoring/ recording Frequency	Monthly	On-site data sheets recorded monthly using weighbridge. Data will be recorded at least monthly with annual aggregation	Measurement Methods and Procedures	On-site data sheets recorded monthly using weigh bridge. Weighbridge will be subject to periodic calibration (in accordance with stipulation of the weighbridge supplier), also cross check with sales of compost	Trucks assigned for EFB transportation from mill to compost plant will be weighed at the mill using the weighbridge.  The weighbridge will be maintained as per manufacturer / supplier's recommendations and calibrated at least once in 3 years.	OK
	Monitoring Methodology description	PDD description														
Unit	tonnes	tonnes														
Monitoring/ recording Frequency	Monthly	On-site data sheets recorded monthly using weighbridge. Data will be recorded at least monthly with annual aggregation														
Measurement Methods and Procedures	On-site data sheets recorded monthly using weigh bridge. Weighbridge will be subject to periodic calibration (in accordance with stipulation of the weighbridge supplier), also cross check with sales of compost	Trucks assigned for EFB transportation from mill to compost plant will be weighed at the mill using the weighbridge.  The weighbridge will be maintained as per manufacturer / supplier's recommendations and calibrated at least once in 3 years.														

			Validated situation			Conclusion
			Validation Opinion: The validation team confirms that the parameter is in accordance with the monitoring methodology. The value of data considered for ex-ante estimation of ER for Phase I and Phase II have been based on the quantum of FFB processed in these phases, which is 72,000 tonnes and 162,000 tonnes multiplied by the conversion factor of 0.23 t EFB/ t FFB. Section 6c of this validation protocol shows the validation of the FFB in Phases I & II and the conversion factor from FFB to EFB.			
$Q_{ww,i,y}$  Parameters related to baseline emissions from wastewater co-composted (As per relevant provisions in AMS-III.H Version 16)	The flow of wastewater	Volume of wastewater (POME) treated in month		Monitoring Methodology description	PDD description	OK
			Unit	m <sup>3</sup> /month	m <sup>3</sup> / month	
			Monitoring/ recording Frequency	Monitored continuously (at least hourly measurements are undertaken, if less, confidence/precision level of 90/10 shall be attained)	Monitored continuously using a flow meter. Hourly records will be made. When the meter is removed for off-site calibration, which may take several days, the volume will be calculated based on POME: FFB ratio used during ex-ante calculations. During the ex-ante calculations a value of 0.79 (for year 2009) has been taken for conservativeness, instead of average of three year data which is 0.95m <sup>3</sup> /tFFB.	
			Measurement Methods and Procedures		The flow meter would be subjected to calibration once in 3 years. Records of calibration will be kept at site.	
			Validation Opinion: The validation team confirms that the parameter is in accordance with the monitoring methodology since hourly records are to be maintained and calibration undertaken once in 3 years. For ex-ante estimation, the FFB processed in Phase I and Phase II is multiplied by 0.79 which is a conversion factor of POME generation per tonne of FFB. Section 6c of this validation protocol includes the validation of this conversion factor used.			

			Validated situation			Conclusion
COD <sub>y,ww,untreated,y</sub> Parameters related to baseline emissions from wastewater co-composted (As per relevant provisions in AMS-III.H Version 16)	The chemical oxygen demand of the wastewater before and after the treatment system affected by the project activity	Chemical Oxygen Demand of wastewater (POME) entering the project activity		Monitoring Methodology description	PDD description	OK
			Unit	t COD/m <sup>3</sup>	t COD/m <sup>3</sup>	
			Monitoring/ recording Frequency	Samples and measurements shall ensure a 90/10 confidence/precision level	COD will be analysed once in two weeks. Date, time and place of sampling will be noted.  The validation team confirmed the monitoring frequency to ensure 90/10 confidence/precision level conforming with paragraph 109 of Annex 6 Best Practices Examples Focusing on Sample Size and Reliability Calculations Version 01.0	
			Measurement Methods and Procedures	Measure the COD according to national or international standards. COD is measured through representative sampling	Samples will be analysed as per nationally internationally accepted standards.	
			Validation Opinion: The validation team confirms that the parameter is in accordance with the monitoring methodology. The sample size required to achieve 90/10 confidence/ precision level has been derived from the mean and standard deviation record available in year 2009 and applying the Guidelines for Sampling and Surveys for CDM Project activities and Programme of Activities (version 02.0), EB 69 Annex 05. The sample size required as per the Guidelines is 7. Since according to the monitoring plan, the sample will be drawn and analysed once in two weeks, i.e. a total of 26 samples in a year meets the number of required samples calculated in accordance with the Guidelines.			

			Validated situation	Conclusion		
$Q_{y, treatment,}$	Quantity of solid waste (excluding manure), produced compost	Amount of compost produced			Ok	
				Monitoring Methodology description		PDD description
			Unit	tonnes		tonnes/year
			Monitoring/ recording Frequency	Monthly		On-site data sheets recorded monthly using weighbridge. Trucks assigned for compost transportation will be weighed at the weighbridge. Data will be recorded at least monthly with annual aggregation.
			Measurement Methods and Procedures	On-site data sheets recorded monthly using weigh bridge. Weighbridge will be subject to periodic calibration (in accordance with stipulation of the weighbridge supplier), also cross check with sales of compost.		Calibration of weighbridge will be carried out at least once in 3 years in accordance with stipulation of the weighbridge supplier. The data will be cross-checked with the compost sales records.
			Validation Opinion: The validation team confirms that the parameter is in accordance with the monitoring methodology. Monthly monitoring of weighbridge records of compost transported is being maintained and the weighbridge is subjected to calibration once in three years in accordance with the stipulation of the weighbridge supplier. For ex-ante ERs, the quantity of solid waste has been derived on basis of EFBs processed in the year times a conversion factor of 0.4 t compost/t EFB. Section 6c of this validation protocol includes the validation of this conversion factor used.			

			Validated situation			Conclusion
$CT_y$	Average truck capacity for transportation	$CT_y$ , Average truck capacity for EFB transportation		Monitoring Methodology description	PDD description	OK
			Unit	tonnes/truck	tonnes/truck	
			Monitoring/ recording Frequency	-	Trucks for EFB supply to the compost site will be weighed in the weighbridge regularly and records will be maintained by the operator.	
			Measurement Methods and Procedures	On site measurement	Data from weighbridge measurement can be used to reconfirm the recorded data accuracy. The weighbridge is to be regularly maintained as per manufacturer / supplier 's recommendations and calibrated at least once in 3 years.	
			Validation Opinion: The validation team confirms that the parameter is in accordance with the monitoring methodology since it monitors the quantum of EFB transported through records in the weighbridge and the number of trucks used for such transportation. Calibration of weighbridge has been considered at least once in 3 years in accordance with the weighbridge supplier's recommendation.			
$CT_{y,treatment}$	Average truck capacity for transportation	$CT_{y,treatment}$ , Average truck capacity for compost transportation		Monitoring Methodology description	PDD description	OK
			Unit	tonnes/truck	tonnes/truck	
			Monitoring/ recording Frequency	-	Trucks for compost distribution to the plantation area will be weighed in the weighbridge regularly and records will be maintained	
			Measurement Methods and Procedures	On site measurement	On-site measurements	

			Validated situation			Conclusion
			Validation Opinion: The validation team confirms that the parameter is in accordance with the monitoring methodology since it monitors the quantum of compost transported through records in the weighbridge and the number of trucks used for such transportation. Calibration of weighbridge has been considered at least once in 3 years in accordance with the weighbridge supplier's recommendation.			
DAF <sub>w</sub>	Average incremental distance for raw solid or product transportation	Average incremental distance for EFB transportation		Monitoring Methodology description	PDD description	OK
			Unit	km/truck	km/truck	
			Monitoring/recording Frequency	Annually	Since the distance of transportation of EFB to the project activity will be same, the measurement will be done once at the start of the crediting period  The measurement will be cross-checked once in a year.	
			Measurement Methods and Procedures	On site measurement, assumption to be approved by DOE	On site measurement.	
			Validation opinion: It is reasonable to accept that the distance of transportation from EFB to project site remains the same and therefore cross-checking this once a year as per the requirements of the methodology is acceptable.			
DAF <sub>treatment</sub>	Average incremental distance for raw solid or product transportation	Average distance travelled by trucks for transporting compost to be applied in the plantation		Monitoring Methodology description	PDD description	OK
			Unit	km/truck	km/truck	
			Monitoring/recording Frequency	Annually	The average distance travelled by each truck will be calculated once annually. The truck driver will record the meter reading prior to trip and after the compost distribution trip to	

			Validated situation			Conclusion
					measure distance travelled by the truck for each trip	
			Measurement Methods and Procedures	On site measurement, assumption to be approved by DOE	On-site measurement	
			Validation opinion: It is reasonable to accept that the distance of transportation from EFB to project site remains the same and therefore cross-checking this once a year as per the requirements of the methodology is acceptable.			
$FC_{diesel, onsite, y(L)}$	Parameters related to emissions from electricity and/or fuel consumption/ “Tool to calculate project or leakage CO2 emissions from fossil fuel combustion” (Version 02); Quantity of fuel type i combusted in process j during the year y	Quantity of diesel consumed for the project activity		Monitoring Methodology description	PDD description	OK
	Unit	Mass or volume unit per year (e.g. tonne/yr or m³/yr)	Litres / year			
	Monitoring/ recording Frequency	Continuously	Monitored using ruler gauge continuously whenever fuel is withdrawn from the tank.			
	Measurement Methods and Procedures	<ul style="list-style-type: none"><li>Use either mass or volume meters. In cases where fuel is supplied from small daily tanks, rulers can be used to determine mass or volume of the fuel consumed, with the following conditions: The ruler gauge must be part of the daily tank and calibrated at least once a year and have a book of control for recording the measurements (on a daily basis or per shift);</li></ul>	Onsite measurements - Measured volume of diesel consumed by machinery / vehicles.  Data will be cross-checked with bills / invoices from fuel suppliers. The ruler gauge will be calibrated once a year.			

			Validated situation		Conclusion
				<ul style="list-style-type: none"> <li>Accessories such as transducers, sonar and piezoelectronic devices are accepted if they are properly calibrated with the ruler gauge and receiving a reasonable maintenance;</li> <li>In case of daily tanks with pre-heaters for heavy oil, the calibration will be made with the system at typical operational conditions.</li> </ul>	
			<p>Validation opinion: The PP has chosen volume measurement which is acceptable. Consumption measured through a ruler gauge cross-checked with purchase records/ invoices is considered acceptable. The ex-ante estimation of diesel is calculated on basis of assumption of running hours of tractor and the machinery which is transparently shown in the ER/IRR spreadsheet and appropriate.</p>		



			Validated situation	Conclusion	
O <sub>2</sub> content	Check of aerobic conditions of the composting process	O <sub>2</sub> content, Percentage of dissolved oxygen in composting process		OK	
			Monitoring Methodology description		PDD description
			Unit		%
			Monitoring/ recording Frequency		Daily measurements throughout the year but aggregated once per year only.
			Measurement Methods and Procedures		<p>Technical measures shall be provided to ensure the aerobic conditions of the composting process. Oxygen content of the gas phase inside the windrows needs to be monitored, it can be done via multiple sample measurements throughout different stages of the composting process, with maximum margin of error of 10% at a 90% confidence level. For this purpose a portable oxygen meter can be used with lancets of at least 1 m length to measure oxygen in representative points within the spatial dimensions of windrow.</p>
Validation opinion: The validation team confirms that the parameter is in accordance with the monitoring methodology					

			Validated situation			Conclusion
$f_y$	Fraction of methane captured at the SWDS and flared, combusted or used in another manner that prevents the emissions of methane to the atmosphere in year y  Methodological Tool “Emissions from solid waste disposal sites” Version 06.0.1	Fraction of methane captured at the SWDS and flared, combusted or used in another manner that prevents the emission of methane to the atmosphere in year y		Monitoring Methodology description	PDD description	OK
			Unit	-	-	
			Monitoring/ recording Frequency	For application A: Once for the crediting period (f = $f_y$ )  For application B: Annually	Once in a year	
			Measurement Methods and Procedures	-	This parameter will be monitored annually to reflect the situation at the landfill site	
			Validation opinion: The validation team confirms that there is currently no regulation in the host country that specifies the fraction of methane to be captured and flared. Therefore, the maximum of either the contract or regulation requirement specifying the amount of methane that must be destroyed/ used or historic data on the amount captured is considered appropriate. Monitoring frequency specified annually is considered appropriate.  The validation team confirms that the parameter is in accordance with the monitoring methodology			
$EF_{CO_2, diesel, onsite, y}$	Weighted average CO <sub>2</sub> emission factor of fuel type <i>i</i> in year <i>y</i> .  Methodology Tool “Tool to calculate project or leakage CO <sub>2</sub> emissions from fossil fuel combustion” Version 02	CO <sub>2</sub> emission factor of fuel used (diesel)		Monitoring Methodology description	PDD description	OK
			Unit	tCO <sub>2</sub> /GJ	tCO <sub>2</sub> / GJ	
			Monitoring/ recording Frequency	For a) and b): The CO <sub>2</sub> emission factor should be obtained for each fuel delivery, from which weighted average annual values should be calculated.  For c): Review appropriateness of the values annually	As per “Tool to calculate project or leakage CO2 emissions from fossil fuel combustion” / Version 02, this data has to be monitored and weighted average value has to be adopted; various options of data sources are listed in the tool for monitoring this data. But reliable data sources are not available to monitor as per	

			Validated situation			Conclusion
				For d): Any future revision of the IPCC Guidelines should be taken into account	options (a), (b) and (c), and therefore option (d) which is IPCC default values at the upper limit of the uncertainty at a 95% confidence interval as provided in Table 1.4 of Chapter 1 of Vol. 2 (Energy) of the 2006 IPCC Guidelines on National GHG Inventories has been adopted	
			Measurement Methods and Procedures	For a) and b): Measurements should be undertaken in line with national or international fuel standards	Since IPCC default value is adopted, weighted average CO <sub>2</sub> emission factor need not be calculated. Any change in IPCC value for this data will be accordingly adopted.	
			Validation Opinion: This parameter will be in accordance with the IPCC value and changed as per specifications in the Kyoto Protocol commitment period.			
NCV <sub>diesel,y</sub>	Weighted average net calorific value of fuel type <i>i</i> in year <i>y</i>			Monitoring Methodology description	PDD description	OK
			Unit	GJ per mass or volume unit (e.g. GJ/m <sup>3</sup> , GJ/tonne)	GJ/tonne	
			Monitoring/ recording Frequency	For a) and b): The NCV should be obtained for each fuel delivery, from which weighted average annual values should be calculated  For c): Review appropriateness of the values annually	As per “Tool to calculate project or leakage CO2 emissions from fossil fuel combustion” / version 02, this data has to be monitored and weighted average value has to be adopted; various options of data sources are listed in the tool for monitoring this data. But	

			Validated situation			Conclusion
				For d): Any future revision of the IPCC Guidelines should be taken into account	reliable data sources are not available to monitor as per options (a), (b) and (c), and therefore option (d) which is IPCC default values at the upper limit of the uncertainty at a 95% confidence interval as provided in Table 1.2 of Chapter 1 of Vol. 2 (Energy) of the 2006 IPCC Guidelines on National GHG Inventories has been adopted	
			Measurement Methods and Procedures	For a) and b): Measurements should be undertaken in line with national or international fuel standards	Since IPCC default value is adopted, weighted average net calorific value need not be calculated. Any change in IPCC value for this data will be accordingly adopted.	
			Validation Opinion: This parameter will be in accordance with the IPCC value and changed as per specifications in the Kyoto Protocol commitment period.			
$\rho_{\text{diesel},y}$	Weighted average density of fuel type $i$ in year $y$	Density of diesel		Monitoring Methodology description	PDD description	OK
			Unit	Mass unit/volume unit	Kg/l	
			Monitoring/ recording Frequency	The density of the fuel should be obtained for each fuel delivery, from which weighted average annual values should be calculated	As per “Tool to calculate project or leakage CO2 emissions from fossil fuel combustion” / version 02, this data has to be monitored and weighted average value has to be adopted; various options of data sources are listed in the tool for monitoring this data. But reliable data sources are not available to monitor as per the	

			Validated situation			Conclusion
					listed options, and therefore publicly available value as stipulated by the Environment Quality Regulations of Malaysia has been adopted	
			Measurement Methods and Procedures	Measurements should be undertaken in line with national or international fuel standards	This is a published by a government agency of Malaysia and can be considered equivalent to 'Regional or national default value which is option c) of the data source for the parameter. Since publicly available (national value) data is adopted, weighted average density need not be calculated. Any change in the 'regional or national default value' will be duly adopted.	
			Validation Opinion: Since National data is publicly available, its use is preferred over other sources. The validation team confirms appropriateness of use of the source data referenced and changes in the value in the event of changes in the default value by the host country.			
2. <i>Implementation of the plan.</i> confirm that the monitoring arrangements described in the monitoring plan are feasible within the project design. Described the steps undertaken to assess this.			The monitoring plan describes the organisational structure, roles and responsibility, the monitoring instruments, monitoring procedures, emergency preparedness and the management system. During the site visit, review of documented procedures and interview with relevant personnel, the validation team has confirmed that the monitoring is planned in a reasonable manner and considered feasible to be implemented by the PP.  The monitoring plan is considered to meet the current good practice in the industry. The operational and management structure that will be implemented in order to			OK

	Validated situation	Conclusion
	monitor emission reduction has been suitably addressed. The monitoring plan complies with the requirements of the monitoring methodology and monitoring arrangements described are feasible within the project design.	
3. <i>Implementation of the Plan</i> : confirm that the means of implementation of the MP, including the data management and quality assurance and quality control procedures, are sufficient to ensure that the emission reductions achieved by / resulting from the proposed CDM project activity can be reported ex post and verified	The monitoring plan structure, data management and quality control and assurance process is adequately addressed in the PDD and provides confidence that this plan can be implemented.	OK

	Validated situation	Conclusion
<b>SECTION 8. Local stakeholder consultation</b>		
1. Determine whether comments by local stakeholders that can reasonably be considered relevant for the proposed CDM project activity, have been invited.	Local stakeholders such as Rompin District Office, Rompin District Department of Environment, residents, nearest Palm Oil Mill employee and manager were invited to attend a stakeholders meeting held at the premise of Tee Teh Palm Oil Mill at 11.00 am on 22 October 2007. The validation team sighted the letter of Invitation dated 01/10/2007 to these parties, invitation advertisement in the local newspaper "Utusan Malaysia" dated 05/10/2007. The method of invitation is considered effective enough to invite relevant local stakeholder to attend the meeting.	OK
2. Confirm that the summary of the comments received as provided in the PDD is complete.	Selected resident and Palm Oil Mill employee were interviewed during site visit to confirm the stakeholders meeting was conducted. The meeting minutes and attendance record was sighted. LRQA team confirmed that the issues raised were addressed adequately.	OK
3. Confirm that the project participants have taken due account of any comments received and have described this process in the PDD.	<p>Comment and query over issues such as any additional traffic load due to project activity implementation, waste water discharge from composting process, worker workload and welfare due to this project activity, Department of Environment approval and compost application was addressed and clarified. The stakeholders did not raise any objection or serious concern against this project.</p> <p>CAR 08 was initially raised to confirm how due account was taken of comments received. The PDD was subsequently revised to confirm that there was no objection or concern raised by stakeholders. During the field visit by the validation team and interaction with the stakeholders, it was confirmed that there were no issues related to the project activity.</p>	<del>CAR 08</del> Closed

	Validated situation	Conclusion
<b>SECTION 9. Environmental Impacts</b>		
1. Is an EIA required by the environmental legislation of the host country? Describe the legislation applicable.	Through host country competence, the validation team confirms that the project activity does not require any EIA based on local environmental quality (prescribed activities) (Environmental Impact Assessment) order 1987.	OK
2. Confirm whether the project participants have undertaken an analysis of environmental impacts and, if required by the host Party, an environmental impact assessment.	Not required	OK
3. Confirm that environmental impacts considered significant by the PPs or the Host country are described in the PDD, including mitigation measures.	Not applicable.	OK



## Findings<sup>2</sup>

<b>1. Grade / Ref:</b>	CAR 01	<b>2. Date:</b>	25/04/2008	<b>3. Status:</b>	Closed
<b>4. Requirement:</b>	Paragraph 44 of VVM Version 01.2				
<b>5. Nature of the Issue Raised:</b>	Letter of Approval from Host Party DNA is not available.				
<b>6. Nature of responses provided by the project participants:</b>	The letter of Approval dated 17 April 2012 is provided by project proponent				
<b>7. Assessment of such responses:</b>	The Letter of Approval from the host country, reference number NRE(S) 602-2/11 Jld 15 (40) dated 17/04/2012 was reviewed. This letter of approval confirms that the country has ratified the Kyoto Protocol, voluntary participation in the proposed CDM project activity and that the project activity contributes to sustainable development of the host country. In addition, the validation team confirmed the title of the project activity exactly matches with that in the PDD and closed this CAR.				
<b>8. References to resulting changes in the PDD or supporting annexes:</b>	None				

<sup>2</sup> Explanation of the Findings Log structure:

1. Grading and Sequential Number of the finding  
6. Details of PP's response

2. Date of Original Finding  
7. Evaluation from the Validation team

3. New, Open, Closed

4. Requirement (VVM, PDD-CDM, etc)

5. Reference to Protocol

8. List of changes made as a result of the finding

<b>1. Grade / Ref:</b>	CAR 02	<b>2. Date:</b>	25/04/2008	<b>3. Status:</b>	Closed
<b>4. Requirement:</b>	Paragraph 44 of VVM Version 01.2				
<b>5. Nature of the Issue Raised:</b>	Letter of Approval from Annex I Party DNA is not available. MoC is also not yet provided.				
<b>6. Nature of responses provided by the project participants:</b>	The Letter of Approval from Environment Agency dated 17 October 2012 is provided. MoC dated 11 September 2012 has been signed by both PPs.				
<b>7. Assessment of such responses:</b>	<p>The validation team confirmed that Environment Agency is the DNA of United Kingdom of Great Britain and Northern Ireland. A letter of Approval from Environment Agency (EA/Belektron/03/2012) dated 17/10/2012 was reviewed and the validation team confirmed that it included the following:</p> <ul style="list-style-type: none"> <li>(a) The Annex I Party ratified the Kyoto Protocol on 31<sup>st</sup> May 2002.</li> <li>(b) The participation is voluntary.</li> <li>(c) The precise title of the proposed project activity as indicated in the PDD.</li> </ul> <p>In addition, the validation team confirmed that Belektron d.o.o is a private entity based in Slovenia. According to Environment Agency's website, LoA is issued to any company irrespective of its location provided that it is based in territories that have ratified the Kyoto Protocol. It was further confirmed that Slovenia has ratified the Kyoto Protocol on 02 August 2002 and therefore Belektron d.o.o is eligible for seeking LoA from UK DNA.</p> <p>MoC dated 11 September 2012 was reviewed and noted to meet the requirements specified in the Modalities of communications between project participants and the executive board (EB45 Annex 59).</p>				
<b>8. References to resulting changes in the PDD or supporting annexes:</b>	Section A.3				

<b>1. Grade / Ref:</b>	CAR 03	<b>2. Date:</b>	25/04/2008	<b>3. Status:</b>	Closed
<b>4. Requirement:</b>	Paragraph 58 of VVM Version 01.2				
<b>5. Nature of the Issue Raised:</b>	PDD section A.2 describe mill hourly capacity is 45 tonnes FFB. However current capacity is only 20 tonnes an hour				
<b>6. Nature of responses provided by the project participants:</b>	Revised PDD in March 2010 shows that the capacity is revised to 20 tonnes FFB per hour, with expansion plan to 45 tonnes FFB an hour.				
<b>7. Assessment of such responses:</b>	<p>A letter from Tee Teh Palm Oil Mill Sdn Bhd. to Hi-Tech Activated Carbon Sdn Bhd. Dated 14 Oct 2007 states that the palm oil mill is in anticipation of an increase in production demand for crude palm oil and related products in Malaysia. During the site visit, it was informed that the expansion of the mill to 45 tonnes FFB/hr was being undertaken to fully utilise their steriliser that could handle such capacity. The project description in the PDD is now complete.</p> <p>The validation team also confirmed the processing capacity of 45t/h through a renewal approval from the Department of Environment dated 03 July 2012.</p>				
<b>8. References to resulting changes in the PDD or supporting annexes:</b>	PDD Section A.2.				

<b>1. Grade / Ref:</b>	CAR 04	<b>2. Date:</b>	25/04/2008	<b>3. Status:</b>	Closed
<b>4. Requirement:</b>	Paragraph 68 of VVM Version 01.2				
<b>5. Nature of the Issue Raised:</b>	The PDD has applied AMS III.F. Version 04 which is no longer valid.				
<b>6. Nature of responses provided by the project participants:</b>	The PDD has been revised to apply the relevant version. PDD Version 3.0 has now applied the current version of AMS III.F Version 10.				
<b>7. Assessment of such responses:</b>	AMS III.F ver 10 has been correctly applied and relevant sections of the PDD are now in compliance with the methodology. Although AMS. III.F. Version 11.0 is now current, AMS III.F Version 10 is valid for seeking registration until 25/01/2013.				
<b>8. References to resulting changes in the PDD or supporting annexes:</b>	PDD section B.1, B.6, B.7 ER spreadsheet				

<b>1. Grade / Ref:</b>	CAR 05	<b>2. Date:</b>	25/04/2008	<b>3. Status:</b>	Closed
<b>4. Requirement:</b>	Paragraph 89 of VVM Version 01.2				
<b>5. Nature of the Issue Raised:</b>	The data and parameters included in B.6.2 and B.7.1 are not complete e.g. PDD section B.6.2 did not provide all the data and parameters that are available for validation, such as those use for $BE_{CH_4,SWDS,y}$ and $MEP_{y,ww}$ . Parameter notations from the approved methodology have not been adopted.				
<b>6. Nature of responses provided by the project participants:</b>	Revised PDD has incorporated the parameter notations and description in accordance with the requirements of the methodology.				
<b>7. Assessment of such responses:</b>	Parameter notations and descriptions have been confirmed to be in accordance with the requirements of the methodology				
<b>8. References to resulting changes in the PDD or supporting annexes:</b>	PDD Section B.6.2, B.7.1 ER spreadsheet				

<b>1. Grade / Ref:</b>	CAR 06	<b>2. Date:</b>	25/04/2008	<b>3. Status:</b>	Closed
<b>4. Requirement:</b>	Paragraph 98 of VVM Version 01.2				
<b>5. Nature of the Issue Raised:</b>	The start date of the project activity mentioned in PDD section C.1.1 is 01/12/2008. However, a contract dated 13/11/2007 has been issued to Harcos Construction Sdn. Bhd. PP to justify as to why 13/11/2007 should not be considered as the start date				
<b>6. Nature of responses provided by the project participants:</b>	PP accepts 13/11/2007 as the start date and the date is now reflected in PDD section C.1.1. In addition, time line of CDM has been introduced in section B.5.				
<b>7. Assessment of such responses:</b>	Start date of 13/11/2007 is acceptable since it is the earliest date that can be considered as a 'start date' in accordance with the CDM Glossary. The evidence related to the various timelines was confirmed. The project activity meets the requirements stipulated in 'Guidelines on prior consideration of CDM'.				
<b>8. References to resulting changes in the PDD or supporting annexes:</b>	PDD section B.5 and C.1.1				

<b>1. Grade / Ref:</b>	CAR 07	<b>2. Date:</b>	25/04/2008	<b>3. Status:</b>	Closed
<b>4. Requirement:</b>	Paragraph 108 of VVM Version 01.2				
<b>5. Nature of the Issue Raised:</b>	<p>Evidence to support the equipment and installation costs has not been provided.  PDD investment barrier identified only 5 years investment analysis. The crediting period is 10 years and project lifetime 20 years. Therefore such analysis is insufficient.</p>				
<b>6. Nature of responses provided by the project participants:</b>	<p>The project proposal by Harcos Construction Sdn. Bhd has been forwarded along with invoices on actual expenses incurred as part of the project activity.  Investment analysis sheet has been revised.  The investment analysis has been carried out for 20 years, equivalent to the expected life of the project activity.</p>				
<b>7. Assessment of such responses:</b>	<p>The project proposal by Harcos Construction Sdn. Bhd. Shows investment cost of RM 2,750,000. Actual cost incurred in the project activity is RM 2,764,300. The conservative figure of RM 2,764,300 has been considered in the investment analysis which is appropriate.  Consideration of assessment for a period of 20 years (lifetime of the project activity) is in line with the Guidelines on the assessment of investment analysis.</p>				
<b>8. References to resulting changes in the PDD or supporting annexes:</b>	<p>Investment analysis  PDD section B.5 (IRR and sensitivity analysis)</p>				

<b>1. Grade / Ref:</b>	CAR 08	<b>2. Date:</b>	25/04/2008	<b>3. Status:</b>	Closed
<b>4. Requirement:</b>	Paragraph 128 of VVM Version 01.2				
<b>5. Nature of the Issue Raised:</b>	PDD Section E.3 on how due account was taken of any comments received from the local stakeholder consultation process is incomplete				
<b>6. Nature of responses provided by the project participants:</b>	There were no objections raised by stakeholders. A statement appeared in section E.2 that stated. 'In summary, there was no objection or serious concern raised by stakeholders'. The questions raised by the stakeholders have now been included in section E.2 and the response provided during the stakeholder consultation is now reported in section E.3.				
<b>7. Assessment of such responses:</b>	The validation team cross-checked and verified the responses reported where formal consultation process with local stakeholders was held on 22/10/2007 at Tee Teh Palm Oil Mill. Invitations to the local stakeholders to the consultation were made through advertisements in local newspaper Utusan Malaysia from 05/10/2007. Invitation letters were sent on 01/10/2011 for the government agencies, local authorities. The meeting was attended by a total of 8 (eight) participants which included representatives from local residents. This was evident in the signed attendance list and minutes of meeting. The participants' comments were recorded and summarised in the meeting minutes, which is reproduced in PDD Version 3.4 Section E.2 & E.3. There were no adverse comments and objections received.				
<b>8. References to resulting changes in the PDD or supporting annexes:</b>	PDD section E.2 and E.3.				



<b>1. Grade / Ref:</b>	CAR 09	<b>2. Date:</b>	07/08/2012	<b>3. Status:</b>	Closed
<b>4. Requirement:</b>	Paragraph 115 of VVM Version 01.2				
<b>5. Nature of the Issue Raised:</b>	PP to justify the technological barrier presented through application of the Guidelines on the objective demonstration of barriers.				
<b>6. Nature of responses provided by the project participants:</b>	Presentation on technological barrier has been removed from the PDD. Additionality demonstration is through investment analysis.				
<b>7. Assessment of such responses:</b>	The PP has revised the Section B.5 of PDD, where presentation on technological barrier was eliminated. The additionality was demonstrated according to "Guidelines on the demonstration of additionality of small-scale project activities" Version 9.0 Annex 27 EB 68, where at least one of the barriers was explained; in this case, investment barrier was used.				
<b>8. References to resulting changes in the PDD or supporting annexes:</b>	Section B.5				

<b>1. Grade / Ref:</b>	CL 01	<b>2. Date:</b>	21/11/2012	<b>3. Status:</b>	Closed
<b>4. Requirement:</b>	Paragraph 58 of VVM Version 01.2				
<b>5. Nature of the Issue Raised:</b>	PP to clarify the geo coordinates stated in the PDD since use of Google Earth does not show anything at the coordinates stated in the PDD.				
<b>6. Nature of responses provided by the project participants:</b>	Revised PDD with a snapshot of Google Earth has been provided.				
<b>7. Assessment of such responses:</b>	PP has revised the geo coordinates of the project activity in line with the coordinates found through Google Earth. The validation team confirmed that the coordinates from the snap shot have been used in the revised PDD and closed this finding.				
<b>8. References to resulting changes in the PDD or supporting annexes:</b>	A.4.1.4.				