**Programme design document form for small-scale CDM programmes of activities**

**(Version 03.0)**

*Complete this form in accordance with the Attachment "Instructions for filling out the programme design document form for small-scale CDM programmes of activities" at the end of this form.*

| **PROGRAMME DESIGN DOCUMENT (PoA-DD)** | |
|---|---|
| **Title of the PoA** | Improved Cookstoves for Haiti |
| **Version number of the PoA-DD** | 7 |
| **Completion date of the PoA-DD** | 20/02/2015 |
| **Coordinating/ managing entity** | C-Quest Capital Malaysia Global Stoves Limited |
| **Host Party(ies)** | Haiti |
| **Sectoral scope(s) and selected methodology(ies), and where applicable, selected standardized baseline(s)** | Sectoral Scope 3 (Energy Demand), Methodology AMS-II.G version 6 (Energy Efficiency Measures in Thermal Applications of Non-Renewable Biomass) |

# PART I. Programme of activities (PoA)

## SECTION A. General description of PoA

### A.1. Title of the PoA

>> Improved Cookstoves for Haiti
Version 7
01/02/2015

### A.2. Purpose and general description of the PoA

>> **1. Policy/measure or stated goal of the PoA**

The goal of this SSC-PoA is to increase availability and affordability of improved cookstoves (ICS) in Haiti. The ICS would be distributed/installed in households, schools, and amongst street food vendors who at present use inefficient cooking appliances. In turn, the ICS will reduce global greenhouse gas emissions by reducing the quantity of non-renewable biomass consumed as cooking fuel. The end users of the ICS provided through this SSC-PoA will benefit from having improved access to the ICS market, more affordable prices, and added investment in marketing. ICS also have the potential to reduce indoor air pollution levels and the various health risks associated with breathing polluted air, thus resulting in a range of social and economic benefits to users. The proposed PoA will deliver a long-term, secure and simple contribution to sustainable development in the host countries that, without carbon finance, would not exist. The estimated number of CERs is as follows:

| Year | CERs generated per year | # of CPAs |
|---|---|---|
| 2015 | 5,616 | 1 |
| 2016 | 29,411 | 1 |
| 2017 | 53,040 | 2 |
| 2018 | 78,816 | 3 |
| 2019 | 101,426 | 4 |
| 2020 | 117,222 | 4 |
| 2021 | 127,753 | 4 |
| TOTAL | 513,284 | 4 |

**1. General operating and implementing framework of PoA**

This Small-Scale Programme of Activities (SSC-PoA) involves the promotion, distribution and sale of thermally-efficient ICS in Haiti. The ICS disseminated through this Programme will replace the prevailing inefficient three-stone fires, traditional pot supports, or equivalent inefficient cooking appliances with stoves that improve wood combustion and heat transfer to pots, thus saving fuel and lowering greenhouse gas emissions.

C-Quest Capital Malaysia Global Stoves Limited (CQC) is the Coordinating Managing

Entity (CME) of this SSC-PoA[1]. ICSs will be sold on a commercial or a non-commercial basis by CPA Implementers[2]. The POA is open to different CPA Implementers and different models of ICS that meet the eligibility criteria outlined in section B.2 of this PoA-DD. Carbon finance will be used to facilitate the purchase, installation, distribution[3] and marketing of stoves, and make the ICS more affordable to users; without carbon finance, these activities would not take place.

The end user will be informed that carbon finance is being generated by the use of the ICS, and this finance is in turn used to lower the sales price of the ICS. The ICS distributed under this program will contain information indicating that the CERs generated through the use of the stove are transferred to the CME. When possible, the customer will confirm, via the Registration Card[4], its agreement to transfer the rights to the carbon credits or certified emission reductions (CERs) generated to the CME. The project implementers or CME will collect user information via cell phone technologies, retailers, or via the Registration Card. The information collected will be that necessary to uniquely identify ICS and to easily trace and identify each ICS when needed. This information will populate the project database and will be stored by the CME in hard copy and/or in electronic format.

ICS may be imported from outside the project boundaries, including Annex I countries. Thus, technology transfer is envisaged and considered under this SSC-POA.

**2. Confirmation that the proposed PoA is a voluntary action by the coordinating/managing entity.**

The SSC-PoA is a voluntary action operated by the CME, CQC. There are no laws, policies or mandatory requirements in Haiti stipulating or encouraging the adoption of ICS by households, schools or among street-vendors.

**3. Contribution to sustainable development**

The use of charcoal and fuelwood has been documented as one of the mayor causes of deforestation in Haiti.[5] Currently, only 4% of Haiti is covered with forest.[6] The pressure over forests is further evidenced by the fact that around 70% of the energy needs of the

[1] Responsibilities of the CME are described in Sections A.4.4.1.

[2] These are entities which will manage and coordinate the promotion, distribution and/or installation of the ICS in Haiti. The roles and responsibilities of CPA Implementers are described in section C "Management System" below

[3] 'Distribution' in this PoA-DD is taken to include sales.

[4] The term 'registration card' as used in this PoA is taken to include data recording/transfer mechanisms such as Short Message Service (SMS), Information and Communication Technologies ('ICT' – such as PDAs), and/or hard copy records. Information contained in the Registration Card and means of transferring this to the CME is explained in Section C. Management System

[5] Glen G. Stevenson. The Production, Distribution, and Consumption of Fuelwood in Haiti, 1989; ESMAP. Startegy to Alleviate the Pressure of Fuel Demand on Demand Fuelwood resources, 2005. Page 33

[6] FAO. Global Forest Resources Assessment, 2010. Table 3, page 227

country are met through woodfuels[7] and 89.5% of the population uses fuelwood or charcoal as their main cooking fuel.[8] The introduction of ICS in Haiti would reduce the dependency on woody biomass for cooking and reduce the pressure over the remaining forest resources of Haiti. The SSC-PoA will help reduce the use of non-renewable biomass from Haitian forests assisting the maintenance of existing forest stock, protecting natural forest eco-systems, soils, and associated ecosystem services such as the regulation of water-table levels to proven flash flooding. At the same time, the SSC-PoA will reduce greenhouse gas emissions over its lifetime.

The use of inefficient cooking stoves and three-stone fires in homes has been found to cause considerable disease and death, particularly among women and children. In Haiti, it is estimated that lifespan is reduced by 6.6 years due to indoor air pollution resulting from the burning of biomass.[9] The introduction of ICS has the capacity to reduce indoor air pollution. In addition, the ICS provide a safer method for combusting biomass for cooking, helping to reduce burn injuries, especially for children.

The financial burden in Haiti from the purchase of biomass fuels is significant. It is estimated that in Port-au-Prince, households spend as much as 30% of their income on cooking fuels.[10] The economic burden is heightened by the fact that 80% of the Haitian population lives below the poverty line.[11] Haiti itself is one of the world's poorest countries. Its Human Development Index ranks it in number 158 out of 187.[12] Thorough improved thermal efficiency, ICS reduce energy needs and the associated household expenditures on cooking fuel. In addition, considerably less time will need to be spent collecting wood fuel for the family home thereby reducing the work burden on rural families and presenting alternative opportunities for economic development, as saved household labour can be diverted to more productive economic activities.

Finally, the PoA will help strengthen the employee base of implementing organizations and create direct local employment opportunities in operational and/or management roles, as well as possible future assembly, manufacturing, distribution and sales activities.

The proposed PoA will deliver a long-term, secure and simple contribution to sustainable development in Haiti that, without carbon finance, would not exist.

---

[7] ESMAP. Startegy to Alleviate the Pressure of Fuel Demand on National Fuelwood resources, 2007. Page xv

[8] Fafo; PNUD. Survey of Living Conditions in Haiti 2003. Tables 1.3.4.4 and 1.3.4.5 Pages 51 and 52

[9] United Nations 1998, from Environmental Vulnerability in Haiti: Findings and Recommendations, 2007. Page 10

[10] USAID. Assessment of Haiti Alternative Cooking Technologies, 2010. Page 2

[11] CIA World Factbook, Haiti Country Profile, Economy Overview. https://www.cia.gov/library/publications/the-world-factbook/geos/ha.html, accessed December, 2012

[12] UNDP. International Human Development Indicators. http://hdr.undp.org/en/statistics/ , accessed December 2012

### A.3. CMEs and participants of PoA

>> C-Quest Capital Malaysia Global Stoves Limited (CQC) will be the coordinating Managing Entity of this SSC-PoA and is the entity that communicates with the CDM Executive Board. The CME is the only project participant in this PoA.

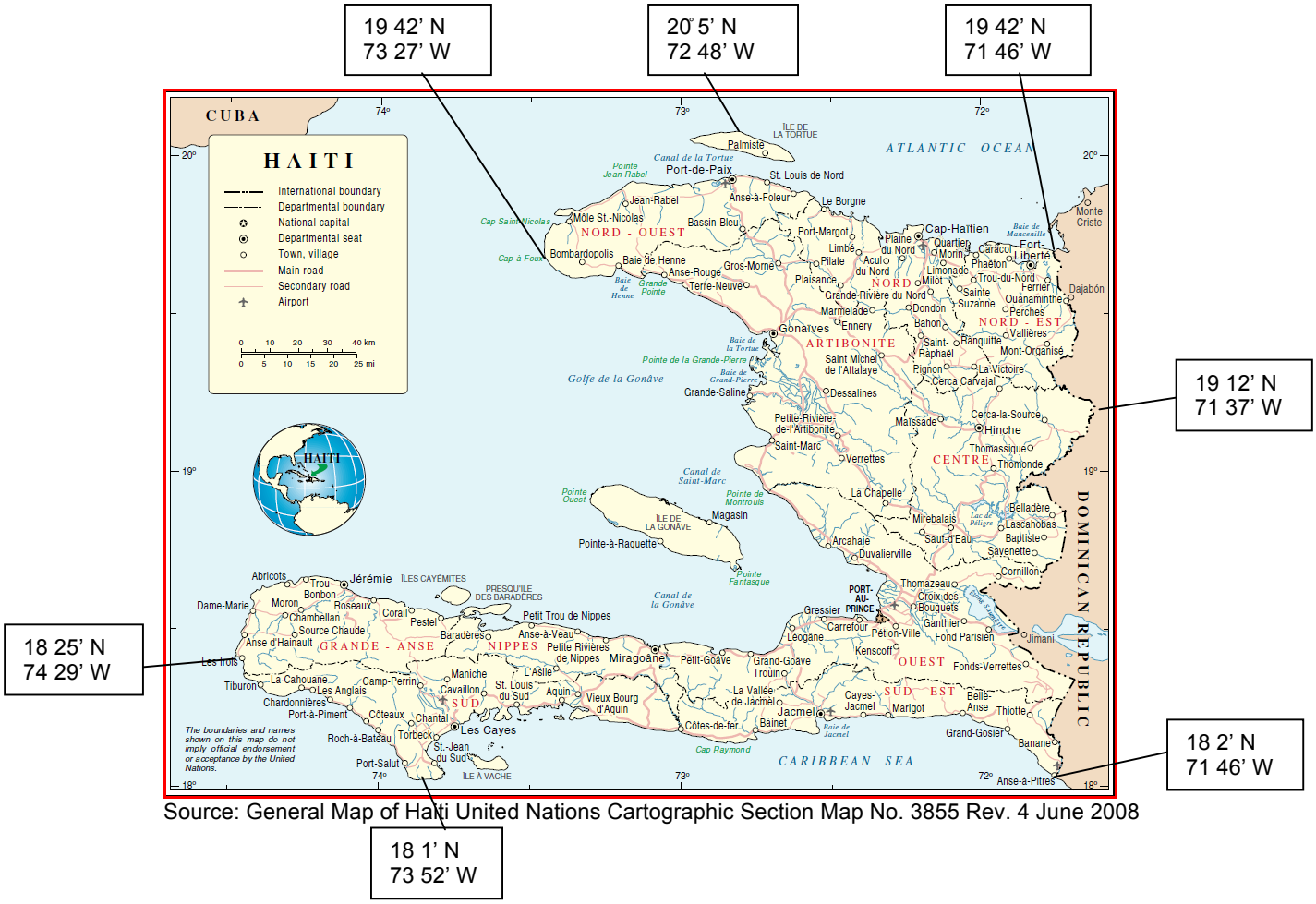
### A.4. Party(ies)

| Name of Party involved (host) indicates host Party | Private and/or public entity(ies) project participants (as applicable) | Indicate if the Party involved wishes to be considered as project participant (Yes/No) |
|---|---|---|
| Republic of Haiti (host) | C-Quest Capital Malaysia Global Stoves Limited | No |

### A.5. Physical/ Geographical boundary of the PoA

>> All CPAs will be implemented within the geographical boundaries of the project is the Republic of Haiti – 19 00' N and 72 25' W.[13]

[13] Source: The CIA World Factbook: https://www.cia.gov/library/publications/the-world-factbook/fields/2011.html Accesed June, 20




Source: General Map of Haiti United Nations Cartographic Section Map No. 3855 Rev. 4 June 2008

The actual project boundary will be the physical, geographical site of the efficient devices that burn biomass, as specified in AMS-II.G Version 06.

## A.6. Technologies/measures

>> The activities under the proposed SSC-PoA will promote ICS that result in reduced fuel consumption and emissions due to cooking and water heating in homes. The ICS used in this SSC-PoA have characteristics that improve the efficiency of combustion and thermal transfer to the pot compared with a traditional pot support or three-stone fire.

An ICS is a single or multi pot portable or in-situ cook stove with a rated thermal efficiency of at least 20% (as per methodology AMS II.G. version 06). Thermal efficiency of the ICS shall be based on certification by a national standards body or an appropriate certifying agent recognized by that body as per methodology AMS-II.G version 06 paragraph 3. Alternatively, manufacturer specifications on efficiency based on water boiling test (WBT) may be used. Any selection of these tests shall be approved by the CME prior to inclusion of ICS under any CPA. Each CPA-Implementer shall clearly describe in detail each type of ICS it is implementing in the SSC-CPA-DD. Below is an indicative and not exhaustive description of the several types of ICS which could be implemented under CPAs:

For the purpose of this POA, ICS can be classified using the following characteristics:

1. **Construction material** - Improved Cooking Stoves are mainly made of single or a combination of the following materials: metal, clay/mud, fired-clay/mud or ceramics and bricks. Classification based on the material helps in selecting an appropriate design on the basis of locally available raw materials, skills for fabrication and necessary production facilities (e.g. centralized/decentralized) in the target area.
2. **Portability** - On this basis, an Improved Cooking Stove can be classified as location-fixed (i.e. attached to a greater structure or non-portable) or portable. Metal and ceramic ICS are normally portable in nature while clay/brick, clay/stone ICS are generally high mass and thus are location-fixed.[14] Stoves in this category can be further sub-divided into different categories depending on the number of pot supports, e.g., single, double and triple.

| Picture (example) | Category | Material | Portability |
|---|---|---|---|
|  | Improved Mud/brick Stoves | Clay, straw, dung, cement, stone, bricks | Fixed (in-situ) |
|  | Improved stove | Metal body and combustion chamber | Portable |

## A.7 Public funding of PoA

>> Public funding from Annex I parties to the United Nations Framework Convention on Climate Change (UNFCCC) is provided to the preparation of the documentation and background research of this PoA. Appendix 2 provides confirmation that this funding is not diversion of Official Development Assistance (ODA).[15]

[14] Note that portable stoves are generally distributed and fixed stoves are generally installed.

[15] Official development assistance (ODA) is defined in the *OECD Glossary of Statistical Terms* as follows: Flows of official financing administered with the promotion of the economic development and welfare of developing countries as the main objective, and which are concessional in character with a grant element of at least 25 percent (using a fixed 10 percent rate of discount). By convention, ODA flows comprise contributions of donor government agencies, at all levels, to developing countries ("bilateral ODA") and to multilateral institutions. ODA receipts comprise disbursements by bilateral donors and multilateral institutions (*OECD Glossary of Statistical Terms*).

## SECTION B. Demonstration of additionality and development of eligibility criteria

### B.1. Demonstration of additionality for PoA

>> Demonstration that in the absence of the CDM either: (i) the proposed voluntary measure would not be implemented, or (ii) the mandatory policy/regulation would be systematically not enforced and that non-compliance with those requirements is widespread in the country/region, or (iii) that the PoA will lead to a greater level of enforcement of the existing mandatory policy /regulation. This shall constitute the demonstration of additionality of the PoA as a whole.

**(i) The proposed PoA is a voluntary coordinated action**

There are no mandated programs, regulations or policies mandating the introduction of improved cook stoves in Haiti. Households, institutions or street-vendors will only participate voluntarily in the Improved Cookstoves for Haiti SSC-PoA. It is hereby confirmed that the proposed PoA is a voluntary coordinated action by CQC.

**(ii) If the PoA is implementing a voluntary coordinated action, it would not be implemented in the absence of the PoA**

According to EB 74 Annex 5 "Standard: Demonstration of additionality, development of eligibility criteria and application of multiple methodologies for programmes of activities", "PoAs that consists of one or more small-scale projects as CPAs shall include eligibility criteria derived from all relevant requirements of the "Guidelines for demonstrating additionality of small-scale project activities."

As per Paragraph 2(c) of Annex 27 of the 68th meeting of the CDM Executive Board, "Guidelines for demonstrating additionality of small-scale project activities" (version 9), projects are considered additional if "project activities are solely comprised of isolated units where the users of the technology/measure are households or communities or Small and Medium Enterprises (SMEs) and where the size of each unit is no larger than 5% of the small-scale thresholds." Annex 21 of EB 61 established 60GWh per year as the SSC threshold. The conversion from 60 GWHe to 180 GWHth per year was approved in a clarification by the small-scale working group (SSC_233). Footnote 1 of Annex 27 of EB 68 clarifies that the size of each unit (ICS) has to be below 3000 MWh of energy savings per year which using the same logic of SSC_233 would translate to 9000 MWhth. Thus, if the ICS distributed under a CPA does not exceed 1 % of the SSC threshold (equivalent to 1800 MWhth per year) and the CPA is Small Scale (or saves in aggregate less than 180 $GWh_{th}$ per year), the CPA is considered additional.

Additionally of CPAs is addressed by eligibility criterion 15 in section B.2 below.

## B.2. Eligibility criteria for inclusion of a CPA in the PoA

>> CPAs to be included under this SSC-PoA must fulfill the following eligibility criteria[16]:

1. Promote and install/ distribute ICS in/to residential households, or schools or street food-vendors in Haiti that use wood fuel or charcoal in three-stone fire stoves or traditional pot supports;
2. Be implemented within the geographical boundary of the Republic of Haiti;
3. Target one specific fuel type (charcoal or wood) and one specific sector (residential households, or food street vendors, or schools);
4. Have a maximum energy saving of 180 $GWH_{th}$/ year throughout each year of the CPA's crediting period to conform with the SSC threshold for type II projects as per the CDM project standard version 8;[17]
5. Comply with the applicability conditions set out in the methodology AMS II.G version 6 “Energy efficiency measures in thermal applications of non-renewable biomass" and further described in Section B.3 of this PoA-DD;
6. Have a database that will uniquely identify and define households, street-vendors or schools in which ICS have been installed or distributed.[18] In addition, each stove itself will be uniquely identified with a serial number;[19]
7. Do not involve households, street-vendors or schools already using an ICS which is not part of a CPA in this PoA - including units involved in any other CPA or CDM or other voluntary scheme (such as Gold Standard, VCS, VER+[20]) project involving the distribution or installation of ICS, and units which have purchased or received an ICS on a commercial or non-commercial basis (eg. NGO distributed

[16] PoA-specific requirements stipulated by the CMEs related to undertaking local stakeholder consultations and environmental impact analysis (EIA) are not applicable as eligibility criteria because both stakeholder consultation and EIA are carried out at PoA level.

[17] At time of inclusion, the CME shall provide the DOE with the calculation demonstrating what the maximum number of ICSs is for that CPA so it remains below the small-scale threshold.

[18] Section C(e) of the PoA-DD clarifies how the CME collects information and what information it collects from users when ICSs are distributed and how the information is stored in the database. This information and procedures are described on the CME manual which shall be provided to the DOE at time of inclusion.

[19] In all cases, the CME must ensure that codes and sequences result in unique serial number combinations. Numbers may be allocated in according to different procedures. For example:

- Simple sequence. Serial numbers will be assigned incrementally to every stove in the CPA. So for the first CPA, the number that will be generated will be CQC-H-1-0001. Then the second stove will be CQC-H-1-0002, etc.
- Sequences nested within specific codes. The CPA Implementers or CME may want to identify batches, stove models, production and distribution years, CPAs, manufacturer, vendors, etc... by a specific code within the serial number. In this case, the sequential numbering may be placed after a specific code or set of codes.

For instance, the fist EcoZoom Jet distributed in 2013 under the CPA may be CQC-H-EZJ-2013-00001. Likewise, the first stove of model YY implemented in 2013 may have the code CQC-H-2013-00001. Despite the last 11 digits of the serial number being the same, the entire serial number is unique.

[20] VCS is the ‘Verified Carbon Standard’, and VER+ is the voluntary standard developed by TÜV SÜD

or government distributed stoves); [21]

8. Not be registered as individual CDM project activities nor included in another registered SSC-PoA, as well as in any other voluntary scheme (such as Gold Standard, VCS, VER+);
9. Be approved by the CME prior to its incorporation into the SSC-PoA;
10. Be able to provide documentary evidence of the start date.[22] The start date of the CPA must be on or after the start date of the PoA;
11. Affirm that no funding for its implementation is coming from Annex I parties, or if it does, that this is not a diversion of Official Development Assistance;[23]
12. Ensure that the ICS installed/distributed under the CPA are single pot or multi pot portable or in-situ cook stoves with specified thermal efficiency of at least 20%. The efficiency of the project systems (ICS) are certified by a national standards body or an appropriate certifying agency recognized by it (using the water boiling tests (WBTs) as outlined in AMS II G, Version 6 approved by the CDM Executive Board). Alternatively manufacturers' specifications may be used and, if required by local regulations, certified by a national standards body or an appropriate certifying agency recognized by it;
13. Use baseline data from one of the baseline surveys attached to thePoA-DD. These baselines include: a) a charcoal baseline for households located in towns or cities with populations above 10,000;[24] b) a charcoal baseline for Port-au-Prince schools;[25] and c) charcoal baselines for Port-au-Prince street vendors.[26] Alternatively, for those target segments where baseline studies are not available, woody biomass savings ($B_{y,savings,i}$) can be calculated ex-post using monitoring parameter $B_{y=1,new,i,survey}$ following methodology AMS-II.G version 6 paragraph 17 or using the default factor outlined in paragraph 19 c of the methodology;[27]
14. CPA implementers must either use the national average non-renewable biomass (NRB) fraction as outlined in EB 67 Annex 22, or develop their own NRB survey in accordance with AMS II G version 06. An NRB survey done on a regional level must limit the geographic scope of the CPA to the particular region relevant to that NRB analysis;

---

[21] At time of inclusion the DOE shall confirm that the CPA is using the methods of data collection described in Section C(e) of the POA-DD and in the CME manual, to confirm this eligibility criterion. Since it may not be possible to assess this criterion in every ICS distributed under this PoA, the fraction of households not complying with this criterion will be deducted from the emissions reductions and the specific households surveyed and not complying with this criterion removed from the database. This fraction will be assessed through monitoring parameter $T_{y,i}$.

[22] The starting date of a CPA could either be the date of first installation of a stove or the date of sale of the first stove in each CPA, as evidenced by the Registration Card, SMS or ITC entries.

[23] At time of inclusion, the CME shall provide the DOE a signed self-declaration letter confirm the use or not use of public funding and in case of use of public funding, confirmation this is not a diversion of ODA.

[24] As per 2009 projections from the Haitian Institute of Statistics and Informatics

[25] The Port-au-Prince area includes the following communal sections: Riviere Froide, Thor, Bizoton, Martissant, Morne l'Hopital, Turgeau, St Martin, Etang du Jonc, Bellevue Chardonniere, Bellevue, Section des Varreux, Petit Bois, and Montagne Noire

[26] *Ibid*

[27] Target segments not covered by baselines, but included in this PoA include wood and charcoal users in population centers of 10,000 or less; wood users in populations of 10,000 or more; as well as street food-vendors and schools outside of the Port-au-Prince area.

15. Ensure that the CPA meets the criteria for not being a de-bundled component of a larger project activity --the debundling rule does not apply if the stove or the independent subsystem, does not exceed 1% of the 180 $GWh_{th}$ of the small-scale (SSC) threshold[28] (as per guidance EB54 Annex 13 and clarification SSC_233) and a CPA is additional if the ICS does not exceed 5% of the SSC threshold (as per guidance of EB68 Annex 27);[29]
16. Include a mechanism that transfers the ownership rights of CERs from the ICS user to the CME (or any affiliate it so designates), the precise mechanism to be established on a CPA basis. For example, a Registration Card, SMS, ICT or other means which is signed or received by the end-user upon purchase or distribution of the stove, which shall state that the end-user transfers ownership of the carbon assets to the CME for the life of the stove;[30]
17. Adhere to all requirements related to sampling for a PoA in accordance with the approved standard (EB 74 Annex 6, or later version), as outlined in section B.7.2 of Part II of the PoA-DD;
18. Involve the promotion and distribution of ICS through direct distribution/installation, delivery, community distribution events, or distribution through commercial/retail outlets.

### B.3. Application of technologies/measures and methodologies

>> This PoA will use the approved methodology AMS-II.G version 6 pertaining to appliances involving the efficiency improvements in the thermal applications of non-renewable biomass. Examples of these technologies and measures include the introduction of high thermal efficiency biomass fired cook stoves or ovens or dryers and / or improvement of energy efficiency of existing biomass fired cook stoves or ovens or dryers (see section A.6 for details).

The SSC-PoA complies with the applicability criterions as per paragraphs 2-4 of AMS.II.G. (Version 6) as described below:

| ***Applicability Criterion*** | ***How the CPA Complies*** |
|---|---|

[28] At time of CPA inclusion the CME shall provide the DOE with calculations confirming that the annual energy saving of an ICS as per cent of SSC threshold remains below 1%. Finally, by meeting the 1% and maintaining it throughout the life of the CPA, it is clear that an ICS will not exceed 5% of the same SSC threshold, and shall be considered additional.

[29] As per Paragraph 2(c) of Annex 27 of the 68th meeting of the CDM Executive Board, GUIDELINES ON THE DEMONSTRATION OF ADDITIONALITY OF SMALL-SCALE PROJECT ACTIVITIES (version 9), projects are considered additional if "project activities are solely comprised of isolated units where the users of the technology/measure are households or communities or Small and Medium Enterprises (SMEs) and where the size of each unit is no larger than 5% of the small-scale thresholds." Annex 21 of EB 61 established 60GWh per year as the SSC threshold. The conversion from 60 GWHe to 180 GWHth per year was approved in a clarification by the small-scale working group (SSC_233). Footnote 1 of Annex 27 of EB 68 clarifies that the size of each unit (ICS) has to be below 3000 MWh of energy saving per year which using the same logic of SSC_233 would translate to 9000 MWhth. Thus, if the ICS distributed under a CPA does not exceed 1 % of the SSC threshold (equivalent to 1800 MWhth,per year) and the CPA complies with eligibility criterion 3 (ie. qualify as a SSC CPA), the CPA is considered additional.

[30] Section C(e) of the POA-DD and CME manual further describes the methods and mechanisms mentioned in this eligibility criterion.

| | |
|---|---|
| Eligible technologies and measures include the introduction of high efficiency biomass fired cook stoves or ovens or dryers to replace existing devices and / or improvement of energy efficiency of existing biomass fired cook stoves or ovens or dryers.<br><br>The efficiency of the project systems will be certified by a national standards body or an appropriate certifying agent recognized by it. Alternatively manufacturers' specifications may be used. Single pot or multi pot portable or in-situ cook stoves with specified thermal efficiency of at least 20%. | CPAs will only allow the use of high thermal efficiency biomass fired improved cook stoves (ICS). The thermal efficiency of the stoves will not be less than 20% as measured by WBTs. The thermal efficiency of the ICS will be certified by a national standards body, or by an appropriate certifying agent recognized by it. Alternatively manufacturers' specifications may be used. CPA eligibility criterion 12 in this PoA-DD ensures that this applicability criterion is met for each CPA before inclusion and therefore for the PoA as a whole. |
| Project participants are able to show that non-renewable biomass has been used in the region since 31 December 1989, using survey methods or referring to published literature, official reports or statistics. | Non-renewable biomass has been used in Haiti since 31 December 1989. Two indicators demonstrate this fact:<br>• *Survey results, national or local statistics, studies, maps or other sources of information, such as remote-sensing data, that show that carbon stocks are depleting in the project area (decline in carbon stocks in the project area)*. Average annual deforestation rates for the period comprised between 1990 and 2010 range between 0.62% to 0.77%.[31] During this period (1990-2010) forest carbon stocks declined by 12.9%.[32]<br><br>• *Increasing trends in fuel wood prices indicating a scarcity of fuel-wood*. Historical data[33] indicate increases in the price of biomass fuels across their |

[31] Forest Resources Assessment Report 2010. Page 232 Table 3

[32] Forest Resources Assessment Report 2010. Page 275 Table 11. In 1990, carbon stocks in living forest biomass was 6.264 million tonnes and by 2010 this number had declined to 5.454 million tonnes. This decline is equivalent to 12.9% over that period (1-5.454 million tonnes/6.264 million tonnes).

[33] Data sources include: Stevenson, G. The Production, Distribution and Consumption of fuelwood in Haiti. The Journal of Developing Areas, Vol. 24, No. 1 (Oct., 1989), pp. 59-76; USAID. Assessment of Haiti Alternative Cooking Technologies, 2010. Page 20 of Annex B; and Women's Refugee Commission and the UN World Food Program "Cooking Needs in Haiti: A Rapid Assessment (2010). Pg. 10

| | |
|---|---|
| | supply chains. For instance, charcoal prices at retail spots in Port-au-Prince have increased in the range of 7 to 168% above the inflation. Concomitantly, inflation-adjusted charcoal-producer prices to intermediaries in the supply chain indicate increases ranging from 27% to 281% in the period comprised between 1985 and 2010. These trends indicate a scarcity of woody biomass fuels in Haiti. |
| The use of this methodology in a project activity under a programme of activities is legitimate if the following leakages are estimated and accounted for, if required on a sample basis using a 90/30 precision for the selection of samples, and accounted for:<br><br>(a) Use of non-renewable woody biomass saved under the project activity to justify the baseline of other CDM project activities can also be a potential source of leakage. If this leakage assessment quantifies a portion of non-renewable woody biomass saved under the project activity that is then used as the baseline of other CDM project activities then $B_{old,i}$ is adjusted to account for the quantified leakage;<br><br>(b) Increase in the use of non-renewable woody biomass outside the project boundary to create non-renewable woody biomass baselines can also be a potential source of leakage. If this leakage assessment quantifies an increase in the use of non-renewable woody biomass outside the project boundary then $B_{old,i}$ is adjusted to account for the quantified leakage;<br><br>(c) As an alternative to subparagraphs (a) and (b), $B_{old,i}$ can be multiplied by a net to gross adjustment factor of 0.95 to account for both leakages, in which case surveys are not required. | This POA, and hence all CPAs under this POA, opt to use option (c) of paragraph 41 of AMS.II.G. (Version 06). I.e. calculations for emission reductions shall be multiplied by a net to gross adjustment factor of 0.95 to account for leakages and no surveys on leakage are required. |

In addition, the sampling plan for the CPAs under this PoA was developed after the Standard for Sampling and Surveys for CDM Project Activities and Programme of

Activities version 4 (EB 74 Annex 6, The Standard for Sampling) and the Guidelines for Sampling and Surveys for CDM Project Activities and Programme of Activities version 3.0 (EB 75 Annex 8). This sampling plan is outlined in Section B.7.2 of the Generic Component Project Activity Design Document below.

### B.4. Date of completion of application of methodology and standardized baseline and contact information of responsible person(s)/ entity(ies)

>> The study on the application of methodology AMS-II.G version 6 was completed on 20/11/2015.
The contact information of the entity responsible for the application of the selected methodologies is:
C-Quest Capital Malaysia Global Stoves Limited
Brighton Place, Lot U0215, Jalan Bahasa c/o Equity Trust Business Centre
P.O. Box 80148
Labuan, Malaysia 87011
+6 087 423828
+6 087 417242
cqc-operations@cquestcapital.com
www.cquestcapital.com

## SECTION C. Management system

>> The following section describes the management system of the PoA in accordance to the Standard for the demonstration of additionality, development of eligibility criteria and application of multiple methodologies for programmes of activities version 3.0 (EB 74 Annex 5) paragraph 19 and to ensure that the CPA meets all requirements and eligibility criteria before inclusion in the registered PoA.

**(a) A clear definition of roles and responsibilities of personnel involved in the process of inclusion of CPAs, including a review of their competencies;**

*Roles of the CME*
- Review all CPAs to confirm that all eligibility requirements are met before a CPA is proposed for inclusion;
- Manage the inclusion of new CPAs with DOE
- Maintain copies of the CPAs database and back-up records necessary to verify stoves sold within each CPA and the SSC-PoA overall;
- Oversee day-to-day operation of the POA;
- Coordinate with a DOE to verify emissions reductions from CPAs; and
- Communicate in all matters with the UNFCCC CDM Executive Board.

*Competencies of the CME*
CQC has been a leader in the development of Programme of Activities under the CDM, having developed the CFL lighting scheme-"Bachat Lamp Yojana" POA (CDM Ref. 3223) and implemented more than 5 CPAs under it (at the time of the validation of this SSC—PoA). CQC is currently the CME for five SSC-PoAs and project participant in another one:

POA 1: Distribution of fuel-efficient improved cook stoves in Nigeria: CME

POA 2: Distribution of ONIL-stoves Mexico: CME
POA 3: Distribution of ONIL-stoves Guatemala: Project Participant
POA 4: Distribution of improved cook stoves in Zambia: CME
POA 5: Improved Cookstoves Program for Malawi and cross-border regions of Mozambique: CME
POA 6: Distribution of Improved Cook Stoves in Sub-Saharan Africa: CME

CQC staff has over 20 years of experience with ICS, having been involved and lead key operations to provide funding for cook stoves in different countries through multiple instruments. These operations have proven successful and introduced consumers to the opportunity of ICS. CQC staff has established working relationship with major international stove producers and have been involved in the development of registered methodologies, PDDs and POAs for ICS.

*Roles of CPA Implementer:* These are entities which will manage and coordinate the promotion, distribution and/or installation of the ICS in Haiti. CPA implementers are also responsible for monitoring activities of the SSC-CPAs. Examples of CPA implementers are: NGOs, religious, environmental, social organizations, farmers associations and private, public or governmental entities. CPA implementers will have an agreement with the CME establishing roles and responsibilities for the successful implementation of the SSC-CPA. Each CPA implementer will define and establish its distribution channel. Three distribution channels are envisaged to achieve the SSC-POA objective:

- The first channel will leverage community organizations including NGOs, religious organizations and farmers associations.
- The second channel will market directly to consumers through direct distribution/installation in communities and households, at local market days, and large community events.
- The third channel will utilize existing local, experienced commercial distributors. Each of the distributors will have their own established network of retailers.

*CPA Implementers will also be responsible for the following:*
- Coordinate and manage the market promotion necessary for successful distribution;
- Coordinate and manage the implementation of the monitoring plan;
- Manage the process of stove selection, stove testing, household baseline and stove use surveys in the field on designs agreed with CME
- Develop and undertake stove distribution, installation and after sales service systems
- Develop and maintain a stove tracking and monitoring and reporting system with a high level of data integrity;
- Maintain an accurate database of stove location for verification and issuance of carbon credits under a design agreed with CME;
- Keeping all records necessary to verify sold stoves within CPAs ;
- Implement and oversee day-to-day operation of the Programme, including ensuring users of the stoves are aware of how they should be used;
- Tracking stoves to end users and verifying use;
- Facilitate the field work of commissioned DOEs for inclusion and verification services
- Supervise and provide training to local personnel for baseline studies, monitoring and stoves distribution:
    - Organize training sessions
    - Distribute training materials

**(b) Records of arrangements for training and capacity development for personnel;**

Key training needs:

- Baseline survey: Perhaps the most important single variable in terms of quantifying CERs will be the baseline fuel usage in households, among street vendors and schools. The quality of the interviewing is very important in getting as accurate a baseline assessment as possible. For this reason, the CME has established general guidance for interviewers to follow when conducting baseline fuel surveys in homes. This guidance is provided to the CPA implementer or survey implementer and outlines the questions and manner in which the interview should be conducted in order to get the most accurate estimate possible.

- Monitoring: Training, including that of field personnel, is needed to ensure monitoring activities are conducted effectively. This will include spot checking a random sample of homes with ICS to determine if stoves are still in use or are eligible under the PoA, as well as a random sample of homes selected for the stove thermal efficiency tests (efficiency tests will be carried out by a third party or trained CPA Implementer personnel using the WBT). The procedures to complete this sampling are described in each CPA Design Documents and meet EB 74 Annex 6 (or later version) confidence/precision requirements. Staff conducting monitoring surveys will attend a training session on the administration of the survey which includes the objectives of the survey, the use of the questionnaire, the recording of non-responses, among other aspects to ensure monitoring surveys capture accurate information. After the training, the same staff will pilot the monitoring survey in households, street vendor stands, or schools (as appropriate) where the PoA is implemented. The CME, CPA Implementers or consultants supervising the monitoring operations will then analyze the data from the pilot and address any further training needs or modifications to the monitoring survey as appropriate. The entity responsible for supervising the monitoring surveys shall not deploy a surveyor to the field when it has grounds to believe the surveyor cannot implement the survey with accuracy.

The CME, CPA Implementer or third party conducting Water Boiling Tests must also ensure that the staff conducting the tests is familiar with the relevant protocols and measurement equipment. This staff shall have experience in conducting WBTs before beginning to monitor the thermal efficiency of the improved cookstoves under this PoA.

- ICS distribution/installation: CPA implementers shall provide evidence of their ability to train technicians/instructors/field staff on ICS assembly, manufacture, installation and distribution in accordance with the type of stove implemented under its CPA.

**(c) Procedures for technical review of inclusion of CPAs;**

The CME will undertake the following activities to ensure proper eligibility of the CPAs before they are uploaded for official inclusion into the PoA:

- CME will review each CPA document and methodically go through each and every eligibility/applicability criterion of the PoA to make sure there is no question that the CPA meets each requirement. In cases where there is doubt, the CME will not upload the CPA document until the requirements are met to the CME's satisfaction.

- CME will review the ICS models that are proposed for distribution/installation under each CPA. If stove models have been used elsewhere, CQC will attempt to get actual performance data in the field to ensure minimum criteria for the PoA are met, such as the 20% minimum thermal efficiency. CME will review any WBT results to ensure they are in line with established protocols and have been conducted either by certified authorities/researchers or based on manufacturer specifications.
- CME will review the database/registration procedures to ensure proper recording of the ICS collected data in line with the methodology and PoA eligibility criteria.
- CME will review all CPA Implementer monitoring procedures to ensure they conform with the PoA and applicable standards, including survey procedures, visual inspections, and WBTs (efficiency of stove) to check that ICS are still in operation and at what efficiency. CPA Implementer will provide the CME a set of documents (e.g. manuals) detailing the training procedures for users and CPA Implementer staff, after sales maintenance, etc, which will be reviewed and approved by the CME prior to CPA inclusion. These documents will be available to the DOE at time of inclusion.
- During the implementation of a CPA, and as needed, CME personnel will visit each CPA region to ensure all procedures outlined in the PoA are being followed, particularly on stove registration and database updating.

**(d) A procedure to avoid double counting (e.g. to avoid the case of including a new CPA that has already been registered either as a CDM project activity or as a CPA of another PoA);**

Each ICS in each SSC-CPA included in this PoA will be identified by a unique combination of customer name, geographical location, as well as a unique serial number.[34] Quality control and quality assurance procedures will minimize any possible double counting. Unique serial numbers will be attached to each ICS distributed under this PoA . Each stove's serial number will be entered into a database that will clearly and unambiguously keep track of the unique stoves in each CPA. Each CPA will have a set of serial numbers so a project participant or verifier can easily determine that any stove identified in any household is affiliated with one – and only one – CPA. No individual serial number can be in more than one CPA, so it will not be possible for one stove to be counted in two different CPAs. In addition, each CPA will be cross-checked with other CPAs in this PoA and with CPAs in any other PoA or in a ICS CDM project activity operating in the country using the websites of the UNFCCC, the Gold Standard, and other relevant voluntary carbon schemes to ensure that the CPA is not included in any other PoA, CDM project activity or voluntary carbon project activity.

When a new ICS Registration Card is filled out, or sent via SMS or ICT, the customer will acknowledge that they previously used a three-stone fire or traditional pot support and are not part of any other ICS program in order to be included in the CPA. Registration data collected will be verified by periodic on-going spot-checks and at the time of monitoring. During the spot checks or monitoring, users who were not using a three-stone fire of traditional pot support prior to obtaining the ICS or that are using an ICS which is not part of this PoA will be detected and eliminated from the database or accounted in monitoring parameter $T_{y,i}$.

**(e) Records and documentation control process for each CPA under the PoA;**

[34] As applicable and available.

*(i) There will be a record keeping system for each CPA under the PoA,*

CPA implementers must gather the necessary information to identify households, street-vendors or schools (hereafter units) using its ICS during the course of the project. To facilitate this process, the CPA implementers will assign a serial number to each ICS or to the unit. This number will be recorded in the Registration Card together with the following information (as appropriate and as available):

- Name of ICS user or head of the unit
- Address of ICS user or unit
- Phone number of ICS user or unit
- GPS location of unit
- Stove model
- Date of installation/distribution
- ICS serial number
- Retailer/distributer information

The data will be gathered using either electronic or paper-based means, directly by the CPA implementer's field personnel or through partner organizations or independent distributers/retailers. This information is detailed on the "Registration Card" or the CPA records, and will allow CPA implementers (or partner organization, distributors/retailers, as appropriate) to track each individual ICS and/or household. The information collected by the CPA implementer is transferred to an electronic database which is updated regularly and shared with the CME. Each CPA will have its own database with a cumulative maximum number of ICSs below or equal to the small-scale limit.

CPA implementers shall ensure that the information contained in the Registration Card is collected and transferred to the CME. Collection of end-users' information can be achieved through different means. Below are a couple of options:

- Direct contact: CPA implementer instructs their field team to fill the Registration Card with users' information when selling/installing the ICS. This is initially envisage to be done manually with ink over a printed Registration Card, but new ICT to increase the efficiency of data collection and data transfer may be applied. One example of these technologies is the personal digital assistant (PDA) - a handhold device that transfers data over the internet. CPA Implementer staff may also contact the users via telephone to obtain the information.
- Indirect: the users' data (as per Registration Card) may be directly transferred to the CPA implementer via Short Message Service (SMS) also known as text messaging service. In this instance, the CPA implementer will provide the user with instruction on how to submit the SMS to the CPA implementer.

The completed Registration Card (paper or soft copy, if via ICT/SMS) will also constitute an agreement that the household is willing to transfer rights to carbon assets created by the ICS to the CME (or any affiliate it so designates); and that it formerly used either a) wood predominantly on a three stone fire or traditional pot support, or b) charcoal predominantly on a traditional pot support. However, previous usage of three-stone fires or traditional pot supports prior to the use of the ICS may be checked during monitoring in case the information cannot be collected in the registration card. Those households that were not using three-stone fires or traditional pot supports prior to the use of the ICS will be removed from the database or accounted in monitoring parameter $T_{y,i}$.

In case a replacement stove is being issued to a customer already registered on the project database, a new registration will not be required. The replacement stove will be recorded in the project database in such a way that it is clear that the replaced stove ceases to be included in the CPA; and the replacement stove is associated with the customer's details as a new ICS, and is included in the CPA as a new ICS with a new serial number.

SMS data will be collated automatically, and backup records will be generated from this data and stored securely by the CPA implementer and the CME. Written registration cards will be entered manually onto the same database and the originals stored securely. In this way there will be both hardcopy (where applicable) and electronic records kept for each ICS installed or distributed in the SSC-PoA.

*(ii) The SSC-CPA included in the PoA is not a de-bundled component of another CDM programme activity (CPA) or CDM project activity.*

Paragraph 10 of EB54, Annex 13 'Guidelines on assessment of de bundling for SSC project activities' states that:

'If each of the independent subsystems/measures (e.g., biogas digester, solar home system) included in the CPA of a PoA is no larger than 1% of the small-scale thresholds defined by the methodology applied then that CPA of PoA is exempted from performing de-bundling check i.e., considering as not being a de-bundled component of a large scale activity.'

The AMS II.G threshold is a maximum energy saving of 180 GWHth/year for small scale projects and 60 GWHth/ year for microscale projects. The debundling rule does not apply to this SSC-PoA as the ICS (the independent subsystem) being installed/distributed do not exceed 1% of the SSC threshold (as per guidance EB54 Annex 13).

Each ICS in a typical CPA is in the order of magnitude of 0.004% to 0.012% of the SSC threshold[35]. This is calculated using the following formula illustrated using the small-scale energy savings threshold of $180GWh_{th}$/year:

Annual Energy Saving of an ICS as per cent of SSC threshold = $((NCV_{biomass} * B_{y,savings})/180GWh_{th})*100$

$= NCV_{biomass} * B_{old,i} * (1-(\eta_{old}/ \eta_{new,i,a=1})/180GWh_{th})*100$

Where:

| | |
|---|---|
| $NCV_{biomass}$ | Net calorific value of the non-renewable woody biomass that is substituted (IPCC default for wood fuel, 0.015 TJ/tonne) |
| $B_{y,savings}$ | Total woody biomass that is saved in tonnes in one year (*y*) |
| $B_{old}$ | Baseline woody biomass fuel consumption per appliance (i.e. in the absence of the project activity) |
| $\eta_{new,i,a=1}$ | Thermal efficiency of the ICS in first year of installation/operation |

[35] Estimates based on ICS with efficiency of 29.5%-45.8% for the range of $B_{old,i}$ parameter values listed in this PoA.

$\eta_{old}$ Thermal efficiency of the baseline stove

*(iii) The provisions to ensure that those operating the CPA are aware of and have agreed that their activity is being subscribed to the PoA;*

CPA implementers have the operational responsibility for implementing and monitoring the CPAs under this SSC-PoA. The CME will have legal contracts put in place with CPA Implementers and, as appropriate, with entities assisting with the implementation of the CPA. These legal contracts shall clearly state that the implementation of CPA activities are subscribed to this SSC-PoA.

**(f) Measures for continuous improvements of the PoA management system;**

The CME will undertake an annual review of the overall PoA management system, including identifying any problems with stove distribution/installation, stove use once in the homes, monitoring continued stove use and overall database maintenance. This review will take place during the verifications stage, which will assist the CME in obtaining an outside perspective of the overall management process.

**(g) Any other relevant elements.**

Project Database. The information collected by the CPA implementer is stored locally on a CPA Implementer database and all data and updates are transferred regularly to an electronic database managed by the CME.

CPA implementer will have the hard-copy data input into an electronic database – which is managed by the CPA implementer. For information transferred via ICT or SMS, there will be no hard-copy. The electronic data is transferred from the ICT device to the database managed by the CPA implementer. Similarly, SMS data is transferred directly to the electronic database managed by the CPA implementer. The CPA implementer will give full access to the database to the CME. The database will be backed up to a server managed by the CME regularly throughout the lifetime of the project. The hardcopy of the Registration Card (if applicable) shall be archived by the CPA implementer.

The CME will maintain copies of the database from all of the CPAs and will also act as a backup to CPA implementers' database/s. The CPA implementer personnel entering the data from each ICS will be trained in the basic functions of Excel (or other appropriate software used to build the database) by CPA implementer to reduce the chance for errors. CPA implementer staff will sample and cross-check the data at minimum once every three months by randomly selecting at least 20 database (across all its CPAs) entries and comparing the information in the cells with the information from Registration Cards and SMS texts, ICT uploads (where possible/available). The database will be sortable by the information collected as per Registration Card and will be made available to the DOE at verification.

The CPA implementer will verify accuracy and completeness and confirm that there is no double entry of serial numbers in the database. The CPA implementer will identify any discrepancy and the correct information will be entered into the database. The CME will oversee and coordinate these measures as necessary.

ICS installation/ distribution methodology**:** In order to succeed in replacing three stone fires or traditional pot support, CPA implementers have the ability to design and distribute/install a variety of types of ICS. Below is a description of how CPA implementers may distribute/install ICS according to two different portability categories:

- Portable stoves:
  - No training of technicians/instructors/field trainers will be required for ICS that are distributed as finished units;
  - CPA implementer shall describe in the CPA how stoves will be distributed;
  - If portable stoves are manufactured or assembled locally, CPA implementers shall describe the training materials, type of training and performances test required.

- Fixed ICS: these are usually brick ICS that are generally built on-site, though these could also be metal-based ICS or prefabricated ICSs that need to be assembled/installed on-site. Designs of fixed ICS vary, but can include one or more pot-holes and other accessories (e.g. grate, chimney). CPA implementer installing fixed ICSs shall demonstrate on CPA its capacity and provide specific details on how it will distribute/install fixed stoves, including but not limited to the following:
  - Design the training material for stove technicians/instructors/field trainers as well as for stove users; though the specific trainings material shall be presented per CPA to the CME at the discretion of the CPA Implementer, at a minimum, the CME will require the following: 1) a Manual for training the technician/instructors/field personal responsible for building the stove, as well as user's manual; 2) documentation on maintenance and after-sales services (if any); 3) description of process for delivery to users any part of the stove which is pre-fabricated (eg. chimney or grate); 4) a complete list of personal responsible for each step of installation and distribution. These materials will be made available for the DOE at CPA inclusion. Indicate the type of training (field-based/practical, classroom or both) that shall be conducted;
  - Conduct performance tests in the field to test the technicians/instructors/field trainers' ability to build/install the ICS;
  - Conduct performance tests in the field to test end-users ability to build and repair the ICS (when appropriate);
  - Develop and present a promotion and awareness plan with designated responsible staff

Location and scale: CPAs will be defined as the sum of identified locations of in-use ICS installed or distributed to consumers previously using three stone fires or traditional pot supports, based on the detailed registration record described above (including ICT/SMS data as applicable). The sum of the location of these ICS will define the spatial boundary of the SSC-CPA, which in turn will fall entirely within the geographical boundary of the SSC-PoA

Each CPA will define a limit to the number of stoves based on the specific model and context, such that each is under the SSC energy savings threshold of 180 $GWh_{th}$/year.

The maximum number of ICS in any one CPA will be dependent on the biomass saved by each ICS ($B_{y,savings,i}$) in one year and shall be calculated in the following manner:

For option 2 of AMS II.G (version 6):

Maximum ICS per CPA = 180 $GWH_{th}$/($NCV_{biomass}$*$B_{y,savings,i}$)

= 180 $GWH_{th}$/( $NCV_{biomass}$ *$B_{old,i}$ *(1-0.10/ $\eta_{new,i,a=1}$))

Where:

| | |
|---|---|
| $NCV_{biomass}$ | Net calorific value of the non-renewable woody biomass that is substituted (IPCC default for wood fuel, 0.015 TJ/tonne) – which can be calculate as (0.015TJ/tonne)*(0.277777GWh/TJ) |
| $B_{old,i}$ | Baseline woody biomass fuel consumption per appliance (i.e. in the absence of the project activity) |
| $\eta_{new,i,a=1}$ | Thermal efficiency of the ICS in its first year of installation/operation |

## SECTION D. Duration of PoA

### D.1. Start date of PoA

>> According to the CDM Project Standard, the start date of a PoA shall be either:

(a) The date of notification of the intention to seek the CDM status by the coordinating/managing entity to the secretariat and the DNA; or

(b) The date of publication of the PoA-DD for global stakeholder consultation.

In this case, the start date shall be the date of publication of the PoA-DD for global stakeholder consultation which is 19/03/2013.

### D.2. Duration of the PoA

>> 28 years

## SECTION E. Environmental impacts

### E.1. Level at which environmental analysis is undertaken

>> The environmental analysis is done at the PoA level.

The technologies distributed through each SSC-CPA present similar positive environmental impacts wherever they are applied and no anticipated negative impacts. Therefore, a PoA-level Environmental Analysis is deemed most appropriate.

### E.2. Analysis of the environmental impacts

>> No negative environmental impacts have been identified from the proposed PoA.

The ICS disseminated in this programme are expected to present a substantially lower risk to the local and global environment compared to three-stone fires and traditional pot support, and also result in real socio-economic and health benefits to users.

In particular, the activities will result in the following positive environmental impacts:

- The PoA will help to significantly reduce greenhouse gas emissions over its lifetime.
- The PoA will help to reduce the use of non-renewable biomass from Haitian forests, helping to conserve existing forest stock and to protect natural forest eco-systems and wildlife habitats.
- The protection of standing forests will also help to protect watersheds that regulate water table levels and prevent flash flooding.
- The amount of indoor pollutants from the burning of biomass in the family home will be reduced. Less carbon dioxide, carbon monoxide and particulates will be emitted due to the decrease in total biomass burned and an increase in the temperature of combustion.

In addition, there are no regulations in Haiti that mandate the assessment of environmental impacts of ICS.

In any case, users of the ICS will be encouraged, through information in training manuals or other means, to adequately dispose the ICS at the end of their useful lives.

## SECTION F. Local stakeholder comments

### F.1. Solicitation of comments from local stakeholders

>> A public local stakeholder consultation (LSC) was held on 15/10/2012 in the Port-au-Prince area. Local stakeholders were invited via 2 newspaper advertisements in "*Le Nouvellieste*" newspaper (on 18/09/2012 and 02/10/2012), and personal invitations (e-mail and hard-copy letters). Invitations were distributed to key stakeholders that represented different government areas, the private sector, and non-governmental organizations. Stakeholders were also invited to present comments via e-mail.

The Project Proponent found no evidence that the host country requires by law a local stakeholder consultation for CDM projects.

### F.2. Summary of comments received

>> Stakeholders presented the following questions during the stakeholder consultation:

1. How many of this type of PoA are in Haiti and can there be more than one of these PoAs in the country?

Answer: CQC only has this PoA at the moment. There can be multiple ICS PoAs in the country. The proposed PoA is open access, meaning that CPA Implementers that meet eligibility conditions can introduce CPAs under this PoA.

2. What is the role of the government in this program?

Answer: The government authorizes the registration of the PoA through the Designated National Authority within the Haitian Ministry of Environment, who, upon favourable acceptance of the project, would issue a Letter of Authorization.

3. What is the role of the DNA?

Answer: In most cases, the DNA ensures that the PoA has a positive impact on the sustainable development of the country. Upon confirmation of the sustainable development benefits of the program, the DNA can issue a Letter of Approval.

4. How will monitoring work for the purpose of this PoA.

Answer: Monitoring procedures will be made public. Monitoring samples have to be randomly selected, and sufficient samples must be collected to attain the required sample sizes. The monitoring plan is presented in the documentation of the Programme of Activities.

5. What is the sample size used for monitoring purposes?

Answer: The sample size can vary. A minimum statistical confidence/precision of 90/10 should be attained. The number of samples will depend on how variable is the data. Higher variability in the samples collected indicate that larger samples sizes must be used to attain the statistical reliability levels.

6. How are the samples selected for monitoring purposes?

Answer: The samples must be randomly selected. Nor CPA Implementers nor the CME can select which stoves will be accounted for the purpose of monitoring emissions reductions.

7. What is CQC's experience in these types of projects?

Answer: CQC has 6 other Cookstoves CDM Programs of Activities in other regions of the world, including Africa and Latin America, in advanced stages of validation. CQC has also experience creating an efficient light bulb PoA in India which is registered under the CDM.

8. What is the future of this PoA if the carbon credit markets are very low at the moment?

Answer: it is uncertain how the carbon markets will evolve. However, this PoA could be an opportunity to use carbon markets to increase improved cookstove market penetration though carbon credits.

The following comments were presented by stakeholder consultation participants:

1. Certain stakeholders indicated that the CME should provide monitoring services and guidance for those parties interested in distributing stoves under the PoA.
2. Other stakeholders indicated a desire that the PoA include project that include sustainable biomass fuels such as vetiver leaves and sugar cane bagasse to feed cookstoves.

### F.3. Report on consideration of comments received

>> The comments were in general very positive. The main concern expressed by the participants was around the implementation of monitoring, since this is an issue that falls out of the area of expertise of potential stove manufacturers/distributors.

To enable the participation of different parties in the PoA, CQC will offer monitoring guidance for those interested in obtaining emissions reductions.

## SECTION G. Approval and authorization

>> The letter of approval was issued on 17/11/2014. The letter of approval was not available at the time of submitting this PoA-DD for validation; however, it was issued later.

# PART II. Generic component project activity (CPA)

## SECTION A. General description of a generic CPA

### A.1. Purpose and general description of generic CPAs

>> The goal of SSC-CPA is to increase availability and affordability of improved cookstoves (ICS) in Haiti.The SSC-CPA will involve the promotion, distribution and sale of cooking stoves (ICS) among the target segment of the CPA in Haiti. The target segment can be households, or schools, or street vendors who use either wood or charcoal in inefficient three-stone fires or traditional charcoal pot supports for cooking. The ICS disseminated through the SSC-CPA will replace the prevailing traditional pot supports or equivalent with stoves which combust woody biomass more efficiently, and improve thermal transfer to pots, hence saving fuel and lowering greenhouse gas emissions.

## SECTION B. Application of a baseline and monitoring methodology and standardized baseline

### B.1. Reference of methodology(ies) and standardized baseline(s)

>> The choice of methodology for a typical SSC-CPA will be AMS II.G Version 06. The activities of each SSC-CPA will entail the distribution/installation of improved cooking stoves, which result in energy efficiency improvements to some application of non-renewable biomass, as required by AMS II.G Version 06.

### B.2. Applicability of methodology(ies) and standardized baseline(s)

>> The choice of methodology for a typical SSC-CPA will be AMS II.G Version 06. The activities of each SSC-CPA will entail the distribution/installation of improved cooking stoves, which result in energy efficiency improvements and reduction in energy consumption to some application of non-renewable biomass, as required by AMS II.G Version 06. These activities also correspond to small-scale project activities of Type II as per the CDM Project Standard version 8.0 (EB 81 Annex 3 paragraph 89).[36] The number

[36] Type II projects comprise energy efficiency improvement project activities that reduce energy consumption, on the supply and/or demand side, with a maximum output of 180 GWh thermal per

of stoves distributed under this CPA will be such as to not exceed 180 GWhth in energy savings per annum, following the requirements of Small Scale Type II projects. The CPA shall remain within this threshold throughout the crediting period. Eligibility criterion 4 in section B.5 below further demonstrates the applicability of this requirement.

In the absence of the project activity, for the purposes of emissions reductions, the baseline is assumed to be the use of fossil fuels to meet similar thermal needs. In this case, as per AMS II.G Version 06, the default emissions factor of 81.6t$CO_2$/TJ is applied. In addition, Version 06 allows a default leakage adjustment factor of 0.95 to be applied to $B_{old,i}$ to account for leakages. This PoA will also use this default.

Because of the nature of traditional baseline stoves in use in the areas part of this POA – including three stone fires and traditional pot supports – it is not possible to ensure that these are disposed of. Therefore, this PoA will monitor the continued use of baseline stoves amongst users of ICS that are in operation in order to ensure that fuel-wood consumption of those stoves is excluded from $B_{old,i}$ (Paragraph 22 AMS II.G Version 06).

According to the methodology, $B_{y,savings}$ may be calculated in a number of ways (as per Options 1, 2 and 3 in Paragraphs 15-18 and this PoA will allow the use of Options 1 (Kitchen Performance Tests, KPTs) and 2 (Water Boiling Tests, WBTs) in CPAs under this POA. Option 3 is excluded because WBTs tend to be more accurate and easier to implement than controlled cooking tests, and WBTs can use a default for the original thermal efficiency (thus efficiency tests only have to be conducted once on ICS). Kitchen Performance Tests are used because they provide an estimate of fuel savings at the household level (versus at the stove level), and can therefore be used when the household has more than one project ICS; they are also a robust method of estimating biomass savings. In case WBTs are used, the CPA will only claim emissions reductions for one stove in the household, irrespective of whether the household has more than one project ICS. During monitoring, Options 1 or 2 may be used at the discretion of CPA Implementers or the CME.

### B.3. Sources and GHGs

>>

| | Source | Gas | Included? | Justification/Explanation |
|---|---|---|---|---|
| Baseline | Combustion of non-renewable biomass for cooking (3-Stone fire or traditional stove) | $CO_2$ | Yes | Major source of emissions |
| | Combustion of non-renewable biomass for cooking (3-Stone fire or traditional stove) | $CH_4$ | No | Minor source of emissions and limited data available |
| | Combustion of non-renewable biomass for cooking (3-Stone fire or traditional stove) | $N_2O$ | No | Minor source of emissions and limited data available |

yearas per the CDM Project Standard version 8 paragraph 89. The conversion from 60 GWHe to 180 GWHth per year was approved in a clarification by the small-scale working group (SSC_233). Footnote 1 of Annex 27 of EB 68 clarifies that the size of each unit (ICS) has to be below 3000 MWh of energy saving per year.

| | | | | |
|---|---|---|---|---|
| Project Activity | Combustion of non-renewable biomass for cooking (ICS) | $CO_2$ | Yes | Major source of emissions |
| | Combustion of non-renewable biomass for cooking (ICS) | $CH_4$ | No | Minor source of emissions and limited data available |
| | Combustion of non-renewable biomass for cooking (ICS) | $N_2O$ | No | Minor source of emissions and limited data available |

### B.4. Description of baseline scenario

>> According to the methodology, it is assumed that in the absence of the project activity, the baseline scenario would be the use of fossil fuels for meeting similar thermal energy needs. Non-renewable biomass is used in the pre-project scenario, which actually has a higher emissions factor than many fossil fuels. As a result, using the default EF of 81.6 tCO2/TJ is conservative.

### B.5. Demonstration of eligibility for a generic CPA

>> Each CPA must meet the following eligibility criteria before inclusion in to the PoA (examples of evidence are also provided in the table below):

| **Eligibility Criteria** | **Type of evidence to demonstrate usability of eligibility criteria** |
|---|---|
| 1. Promote and install/ distribute ICS in/to residential households, or schools or street food-vendors in Haiti that use wood fuel or charcoal in three-stone fire stoves or traditional pot supports; | ICS tests to confirming thermal efficiency is above 20% and specification of target segment of the CPA. |
| 2. Be implemented within the geographical boundary of the Republic of Haiti; | Self-declaration by the CPA Implementer. |
| 3. Target one specific fuel type (charcoal or wood) and one specific sector (residential households, or food street vendors, or schools); | Specification of target segment, location and characteristics of the segment. Stoves distributed elsewhere will not be eligible to claim emissions reductions. |

| | |
|---|---|
| 4. Have a maximum energy saving of 180 $GWH_{th}$/ year throughout each year of the CPA's crediting period to conform with the SSC threshold for type II projects as per the CDM project standard version 8;[37] | Supporting calculations outlining the maximum number of devices to be included in the CPA to avoid surpassing the SSC threshold throughout the CPA crediting period. |
| 5. Comply with the applicability conditions set out in the methodology AMS II.G version 6 "Energy efficiency measures in thermal applications of non-renewable biomass" and further described in Section B.3 of the PoA-DD; | ICS tests to confirm efficiency is above 20% based on water boiling tests; NRB studies and other supporting documentation provided to the DOE, which demonstrates that non-renewable biomass has been used since 31 December 1989 within the CPA boundaries (Haiti); and adoption of default gross adjustment factor of 0.95 for leakage. |

[37] At time of inclusion, the CME shall provide the DOE with the calculation demonstrating what the maximum number of ICSs is for that CPA so it remains below the small-scale threshold.

| | |
|---|---|
| 6. Have a database that will uniquely identify and define households, street vendors or schools in which ICS have been installed or distributed.[38] In addition, each stove itself will be uniquely identified with a serial number;[39] | Project database which includes fields for all the information contained on the Registration Card (or ICT/SMS) - including the serial number. The database will be sortable by customer name, contact details (if available), stove model, location (address/geo-coordinates), date of purchase, retailer/distributer, serial number and be available to the DOE upon each verification. |

[38] Section C(e) of the PoA-DD clarifies how the CME collects information and what information it collects from users when ICSs are distributed and how the information is stored in the database. This information and procedures are described on the CME manual which shall be provided to the DOE at time of inclusion.

[39] In all cases, the CME must ensure that codes and sequences result in unique serial number combinations. Numbers may be allocated in according to different procedures. For example:

- Simple sequence. Serial numbers will be assigned incrementally to every stove in the CPA. So for the first CPA, the number that will be generated will be CQC-H-1-0001. Then the second stove will be CQC-H-1-0002, etc.
- Sequences nested within specific codes. The CPA Implementers or CME may want to identify batches, stove models, production and distribution years, CPAs, manufacturer, vendors, etc... by a specific code within the serial number. In this case, the sequential numbering may be placed after a specific code or set of codes.

For instance, the fist EcoZoom Jet stove distributed in 2013 under the first CPA may be CQC-H-EZJ-2013-00001. Likewise, the first stove of model YY implemented in 2013 may have the code CQC-H-2013-00001. Despite the last 11 digits of the serial number being the same, the entire serial number is unique.

| | |
|---|---|
| 7. Do not involve households, street-vendors or schools already using an ICS which is not identified with a CPA in this PoA - including units involved in any other CPA or CDM or other voluntary scheme (such as Gold Standard, VCS, VER+[40]) project involving the distribution or installation of ICS, and units which have purchased or received an ICS on a commercial or non-commercial basis (eg. NGO distributed or government distributed stoves);[41] | Each ICS in each SSC-CPA included in this PoA will be identified by a unique combination of customer name and geographical location, as well as a unique serial number. No individual serial number can be in more than one CPA, so it will not be possible for one stove to be counted in two different CPAs. In addition, each CPA will be cross-checked with other CPAs in this PoA and with CPAs in any other PoA or in a CDM project activity operating in the country using the UNFCCC, the Gold Standard, and other relevant voluntary carbon schemes to ensure that the CPA is not included in any other PoA, CDM project activity or voluntary project activity. A self-declaration by the CME or CPA Implementer will confirm that the CPA is not part of another PoA or CDM project activity. New customers may also be asked to confirm (via Registration Card or similar) that they are households and that they currently do not own an ICS (whether part of a carbon scheme or not) from another program. If for any reason confirmation is not performed during registration, the households who were using an ICS from another program prior to using an ICS from the program will be noted and incorporated into monitoring parameter $T_{y,i}$ as ineligible stoves (see sections B.7.1 and B.7.2 below) to avoid double counting of emissions reductions. |

[40] VCS is the 'Verified Carbon Standard', and VER+ is the voluntary standard developed by TÜV SÜD

[41] At time of inclusion the DOE shall confirm that the CPA is using the methods of data collection described in Section C(e) of the POA-DD and in the CME manual, to confirm this eligibility criterion. Since it may not be possible to assess this criterion in every ICS distributed under this PoA, the fraction of households not complying with this criterion will be deducted from the emissions reductions and the specific households surveyed and not complying with this criterion removed from the database. This fraction will be assessed through monitoring parameter $T_{y,i}$.

| | |
|---|---|
| 8. Not be registered as individual CDM project activities nor included in another registered SSC-PoA, as well as in any other voluntary scheme (such as Gold Standard, VCS, VER+); | Confirmation by the CME that at time of inclusion of this CPA, no other CPA using the same name was found in any other PoA or in a CDM project activity operating in the country using the UNFCCC, the Gold Standard, and other relevant voluntary schemes. |
| 9. Be approved by the CME prior to its incorporation into the SSC-PoA | Letter by the CME indicating that the CPA has is approved for inclusion under the PoA. |
| 10. Be able to provide documentary evidence of the start date.[42] The start of the CPA date must be on or after the start date of the PoA; | Self-declaration or evidence of first ICS distribution from CPA Implementer indicating the start date of the CPA on or after 19/03/2013 (start date of the Global Stakeholder Consultation). |
| 11. Affirm that no funding for its implementation is coming from Annex I parties, or if it does, that this is not a diversion of Official Development Assistance;[43] | Signed declarations by the CME and donor (if applicable) indicating that Official Development Assistance is not used or that financing to the CPA does not result in diversion of Official Development Assistance. |
| 12. Ensure that the ICS installed/distributed under the CPA are single pot or multi pot portable or in-situ cook stoves with specified thermal efficiency of at least 20%. The efficiency of the project systems (ICS) are certified by a national standards body or an appropriate certifying agency recognized by it (using the Water Boiling Tests (WBTs) outlined in AMS IIG, Version 6 approved by the CDM Executive Board). Alternatively manufacturers' specifications may be used and, if required by local regulations, certified by a national standards body or an appropriate certifying agency recognized by it; | ICS tests to confirming thermal efficiency is above 20%. The tests shall be certified by a national standards body or an appropriate certifying agency recognized by it (using the WBT outlined in AMS IIG, Version 6 approved by the CDM Executive Board). Alternatively manufacturers' specifications may be used. These specifications would be certified by a national standards body or an appropriate certifying agency recognized by it, if required by local regulations. |

[42] The starting date of a CPA could either be the date of first installation of a stove or the date of sale of the first stove in each CPA, as evidenced by the Registration Card, SMS or ITC entries.

[43] At time of inclusion, the CME shall provide the DOE a signed self-declaration letter confirm the use or not use of public funding and in case of use of public funding, confirmation this is not a diversion of ODA.

| | |
|---|---|
| 13. Use baseline data from one of the baseline surveys attached to the PoA-DD. These baselines include: a) a charcoal baseline for households located in towns or cities with populations above 10,000;[44] b) a charcoal baseline for Port-au-Prince schools;[45] and c) charcoal baselines for Port-au-Prince street vendors.[46] Alternatively, for those target segments where baseline studies are not available, woody biomass savings ($B_{y,savings,i}$) can be calculated ex-post using monitoring parameter $B_{y,new,survey,i}$ following methodology AMS-II.G version 6 paragraph 17 or using the default factor outlined in paragraph 19 c of the methodology;[47] | Usage of PoA-approved baseline values to estimate emissions reductions. If ex-post values are used for segments where baseline data is not available, the CPA shall present a plan to sample parameter $B_{y,new,survey,i}$ in accordance to the latest CDM Standard for Sampling and Surveys in CDM Project Activities and Programme of Activities. Alternatively, the CPA shall opt to use the 0.5 tonnes woody biomass per capita per year outlined in paragraph 19 c of AMS-II.G version 6 to estimate parameter $B_{old,i}$. |
| 14. CPA implementers must either use the national average non-renewable biomass (NRB) fraction as outlined in EB 67 Annex 22 or develop their own NRB survey in accordance with AMS II G version 06. An NRB survey done on a regional level must limit the geographic scope of the CPA to the particular region relevant to that NRB analysis; | If regional fNRB values are used, the CME or CPA Implementer shall provide the fNRB study and calculations of the region in question. Otherwise, CPAs shall use the values approved in EB 67 Annex 22 or more recent CDM source. |

[44] As per 2009 projections from the Haitian Institute of Statistics and Informatics

[45] The Port-au-Prince area includes the following communal sections: Riviere Froide, Thor, Bizoton, Martissant, Morne l'Hopital, Turgeau, St Martin, Etang du Jonc, Bellevue Chardonniere, Bellevue, Section des Varreux, Petit Bois, and Montagne Noire

[46] *Ibid*

[47] Target segments not covered by baselines, but included in this PoA include wood and charcoal users in population centers of 10,000 or less; wood users in populations of 10,000 or more; as well as street food-vendors and schools outside of the Port-au-Prince area.

| | |
|---|---|
| 15. Ensure that the CPA meets the criteria for not being a de-bundled component of a larger project activity --the debundling rule does not apply if the stove or the independent subsystem, does not exceed 1% of the 180 $GWh_{th}$ of the small-scale (SSC) threshold[48] (as per guidance EB54 Annex 13 and clarification SSC_233) and a CPA is additional if the ICS does not exceed 5% of the SSC threshold (as per guidance of EB68 Annex 27);[49] | Supporting calculations indicating that devices distributed under the CPA will not surpass 1% of the SSC threshold (or 1.8 $GWh_{th}$/device). |
| 16. Include a mechanism that transfers the ownership rights of CERs from the ICS user to the CME (or any affiliate it so designates), the precise mechanism to be established on a CPA basis. For example, a Registration Card, SMS, ICT or other means, which is signed or received by the end-user upon purchase or distribution of the stove, which shall state that the end-user transfers ownership of the carbon assets to the CME for the life of the stove; [50] | The CPA Implementer or CME shall provide a Registration Card with the list of information that will be collected from users. Sales Team and distributers will be instructed to read the transfer ownership of the carbon assets to the end-user and tick a box next to this paragraph to confirm that the user acknowledge that by purchasing the ICS, it is transferring the carbon rights to the CME. Alternatively, documentation may be included in the ICS indicating that carbon rights are transferred to the CME. |

[48] At time of CPA inclusion the CME shall provide the DOE with calculations confirming that the annual energy saving of an ICS as per cent of SSC threshold remains below 1%. Finally, by meeting the 1% and maintaining it throughout the life of the CPA, it is clear that an ICS will not exceed 5% of the same SSC threshold, and shall be considered additional.

[49] As per Paragraph 2(c) of Annex 27 of the 68th meeting of the CDM Executive Board, GUIDELINES ON THE DEMONSTRATION OF ADDITIONALITY OF SMALL-SCALE PROJECT ACTIVITIES (version 9), projects are considered additional if "project activities are solely comprised of isolated units where the users of the technology/measure are households or communities or Small and Medium Enterprises (SMEs) and where the size of each unit is no larger than 5% of the small-scale thresholds. Annex 21 of EB 61 established 60GWh per year as the SSC threshold. The conversion from 60 GWHe to 180 GWHth per year was approved in a clarification by the small-scale working group (SSC_233). Footnote 1 of Annex 27 of EB 68 clarifies that the size of each unit (ICS) has to be below 3000 MWh of energy saving per year which using the same logic of SSC_233 would translate to 9000 MWhth. Thus, if the ICS distributed under a CPA does not exceed 1 % of the SSC threshold (equivalent to 1800 MWhth,per year) and the CPA complies with eligibility criterion 3 (ie. qualify as a SSC CPA), the CPA is considered additional.

[50] Section C(e) of the POA-DD and CME manual further describes the methods and mechanisms mentioned in this eligibility criterion.

| | |
|---|---|
| 17. Adhere to all requirements related to sampling for a PoA in accordance with the approved standard (EB 74 Annex 6, or later version), as outlined in section B.7.2 of Part II of the PoA-DD; | The Sampling Plan of the CPA shall be in accordance with the approved Sampling Standard (EB 74 Annex 6, or later version). |
| 18. Involve the promotion and distribution of ICS through direct distribution/installation, delivery, community distribution events, or distribution through commercial/retail outlets. | Each CPA under the PoA will distribute ICS on a commercial and/or non-commercial basis to end-users through the CPA Implementers sales team, direct distribution, community events and/or agent distributers. |

## B.6. Estimation of emission reductions of a generic CPA

### B.6.1. Explanation of methodological choices

>> There are two key methodological choices when using AMS II.G. They are listed below:

- Option for determining $\mathbf{B_{y,\ savings,i}}$: According to the AMS II.G (version 6) methodology, $B_{y,savings,i}$ may be calculated in a number of ways (as per Options 1, 2 and 3 in Paragraphs 15-18) and this PoA will allow the use of Options 1 and 2 in CPAs under this PoA.

- Determination of fNRB. This CPA will use the option of using the value outlined in EB 67 Annex 22, which for Haiti, is 0.96.

Emission reductions for each SSC-CPA will be calculated according to the equations outlined in section B.6.3 of this document.

### B.6.2. Data and parameters fixed ex-ante

>>

| **Data / Parameter:** | $\boldsymbol{B_{old,i}}$ |
|---|---|
| Data unit: | Tonnes per annum |
| Description: | Quantity of biomass used in absence of the project activity per household |
| Source of data: | Baseline surveys |
| Value(s) applied: | Dependent on target sector (schools, households or street vendor). The value for households is 5.76 tonnes of woody biomass/household/year; for street food vendors in Port-au-Prince the value is 6.86 tonnes of woody biomass/stove[51]/year if only a single CPA is included, or 6.06 tonnes of woody |

[51] If stove has more than one burner, the value is multiplied by the number of burners.

| | |
|---|---|
| | biomass/stove/year if more than one CPA is included[52]; and for schools in Port-au-Prince the value is 0.28 kg of woody biomass/individual meal. The CME or CPA Implementer may opt to use the default factor of 0.5 tonnes woody biomass per capita per year for biomass-consuming segments not included in the baseline studies as per AMS-II.G version 6 paragraph 19 c. |
| Choice of data or Measurement methods and procedures: | Baseline surveys assessed the average biomass usage per household per annum; per street food vendor stove per annum; and per individual meal at schools. These surveys were applied to users of 3-stone fires or traditional pot supports or traditional stoves, according to interviews. This data was gathered according to: Standard for Sampling And Surveys in CDM Project Activities and Programme of Activities (Version 4); CDM EB 74 Annex 6. |
| Purpose of data | Calculation of baseline emissions |
| Additional comment: | For the purposes of calculating ex-ante emission reductions, the fraction of the baseline that can be attributed to the ICS will be applied to $B_{old,i}$ to adjust its value. The fraction of the baseline that can be attributed to the ICS is represented by monitoring parameter $M_{y,i}$. Note that the adjustment is only applicable to household and schools. The street food vendors baseline is already adjusted on a per stove basis. |

| **Data / Parameter:** | $\eta_{old}$ |
|---|---|
| Data unit: | Fraction |
| Description: | Efficiency of baseline cooking method (system being replaced) |
| Source of data: | Methodology default |
| Value(s) applied: | 0.10 or 0.2, depending on the type of system being replaced |
| Choice of data or Measurement methods and procedures: | AMS II.G version 6, option 2 |
| Purpose of data | Calculation of baseline emissions |
| Additional comment: | |

| **Data / Parameter:** | $f_{NRB,y}$ |
|---|---|
| Data unit: | Fraction |
| Description: | Fraction of woody biomass saved by the project activity in year y that can be established as non-renewable biomass |
| Source of data: | FAO, 2010 |
| Value(s) applied: | 0.96 |
| Choice of data or Measurement methods and procedures: | EB 67 Annex 22 |
| Purpose of data | Calculation of baseline and project emissions |
| Additional comment: | |

| **Data / Parameter:** | $NCV_{biomass}$ |
|---|---|
| Data unit: | TJ/tonne |
| Description: | Net calorific value of the non-renewable woody biomass that is substituted |
| Source of data: | IPCC default |

[52] According to CDM guidance, the average value determined via surveys is applicable to all CPAs of a PoA if 95/10 confidence/precision is achieved. The baseline survey conducted to determine Bold for street food vendors achieved 90/10 confidence precision, but did not reach 95/10 confidence/precision. Therefore, the lower bound of the 95% confidence interval is applied if more than one CPA is included in the PoA.

| | |
|---|---|
| Value(s) applied: | 0.015 |
| Choice of data or Measurement methods and procedures: | AMS II.G, version 6 |
| Purpose of data | Calculation of baseline and project emissions |
| Additional comment: | |

| **Data / Parameter:** | $EF_{projected\ fossilfuel}$ |
|---|---|
| Data unit: | tCO2/TJ |
| Description: | Emission factor: substitution of non-renewable biomass by similar consumers |
| Source of data: | IPCC default |
| Value(s) applied: | 81.6 |
| Choice of data or Measurement methods and procedures: | AMS II.G, version 6 |
| Purpose of data | Calculation of baseline and project emissions |
| Additional comment: | |

| **Data / Parameter:** | ***L*** |
|---|---|
| Data unit: | Leakage |
| Description: | Leakage adjustment Factor |
| Source of data: | Default |
| Value(s) applied: | 0.95 |
| Choice of data or Measurement methods and procedures: | A net to gross adjustment factor (0.95 default) is applied in order to adjust $B_{old}$ to account for leakages as per paragraph 30 and 41 c of the AMS II.G, version 6 methodology. |
| Purpose of data | Calculation of leakage |
| Additional comment: | |

| **Data / Parameter:** | ***Charcoal to Wood Ratio*** |
|---|---|
| Data unit: | Ratio |
| Description: | Conversion from charcoal to wood (the mass of charcoal is equivalent to six times the mass of wood). |
| Source of data: | IPCC |
| Value(s) applied: | 6:1 |
| Choice of data or Measurement methods and procedures: | AMS II.G version 06 paragraph 20 states, "Where charcoal is used as the fuel, the quantity of woody biomass [...] may be determined by using a default wood to charcoal conversion factor of 6 kg of firewood (wet basis) per kg of charcoal (dry basis)." |
| Purpose of data | Calculation of baseline and project emissions |
| Additional comment: | |

### B.6.3. Ex-ante calculations of emission reductions

>> Emissions reductions are calculated as:

$$ER_y = \sum_i ER_{y,i}$$

Where:

| | | |
|---|---|---|
| i | = | Indices for the situation where more than one type of project device is introduced to replace the pre-project devices. For the purposes of accounting emissions reductions, a type of device is a stove model implemented in a single fuel-consumption cluster. |
| $ER_y$ | = | Emission reductions during year y in tCO2e |
| $ER_{y,i}$ | = | Emission reductions by project device of type i during year y in tCO2e |

$$ER_{y,i} = \sum_{a=1}^{y} B_{y,savings,i,a} \times N_{y,i,a} \times \frac{\mu_{y,i}}{365} \times f_{NRB,y} \times NCV_{biomass} \times EF_{projected\_fossilfuel} \times L \quad 53$$

Where:

| | | |
|---|---|---|
| $B_{y,savings,i,a}$ | = | Quantity of woody biomass that is saved in tonnes per device of type *i* and age *a* in monitoring period *y* |
| $f_{NRB,y}$ | = | Fraction of woody biomass saved by the project activity in year *y* that can be established as non-renewable biomass using survey methods or government data or default country specific fraction of non-renewable woody biomass (fNRB) values available on the CDM website[54] |
| $NCV_{biomass}$ | = | Net calorific value of the non-renewable woody biomass that is substituted (IPCC default for wood fuel, 0.015 TJ/tonne, based on the gross weight of the wood that is 'air-dried') |
| $EF_{projected\_fossilfuel}$ | = | Emission factor for the substitution of non-renewable woody biomass by similar consumers. Use a value of 81.6 t $CO_2$/TJ[55] |
| $N_{y,i,a}$ | = | Number of project devices of type *i* and age *a* operating in monitoring period *y* |
| L | = | Leakage factor (0.95 as per paragraph 30 and 41 of AMS-II.G version 6) |

[53] Note that the equation outlined in AMS-II.G is slightly different. The equation was modified to accommodate the multiple types of devices in a single CPA.

[54] Default values endorsed by designated national authorities and approved by the Board are available at <http://cdm.unfccc.int/DNA/fNRB/index.html>.

[55] This value represents the emission factor of the substitution fuels likely to be used by similar users, on a weighted average basis. It is assumed that the mix of present and future fuels used would consist of a solid fossil fuel (lowest in the ladder of fuel choices), a liquid fossil fuel (represents a progression over solid fuel in the ladder of fuel use choices) and a gaseous fuel (represents a progression over liquid fuel in the ladder of fuel use choices). Thus a 50% weight is assigned to coal as the alternative solid fossil fuel (96 t $CO_2$/TJ) and a 25% weight is assigned to both liquid and gaseous fuels (71.5 t $CO_2$/TJ for kerosene and 63.0 t $CO_2$/TJ for liquefied petroleum gas (LPG).

| | |
|---|---|
| $\mu_{y,i}$ | Number of days of utilization of the project device during the year 'y'. Its value may be considered as 365 where it can be demonstrated that the pre-project device has been decommissioned and is no longer used, otherwise it shall be determined as per paragraphs 22-24 of AMS-II.G version 6 |
| a | 'a' is the indices for the age (in years) of the cook stoves that are operating in the year 'y' of the crediting period. At any year y of the crediting period (e.g. y = 1, 2, 3…7 or 10) there will be a population of $N_{y,ia,}$ operational devices of the type i with age varying from a=1 (the cook stoves installed during the current year y) up to the age a=y (the cook stoves installed during the first year of the crediting period). Since the lifetime of cook stoves is often shorter than the length of the crediting period and cook stoves are likely to show significant efficiency losses over time, this aspect needs to be captured through the monitoring plan |

**Calculating $B_{y, savings,i,a}$**

According to the AMS II.G (version 6) methodology, $B_{y,savings,i,a}$ may be calculated in a number of ways (as per Options 1, 2 and 3 in Paragraphs 15-18) and this PoA will allow for its CPAs the use of Options 1 (Kitchen Performance Tests, KPTs) and 2 (Water Boiling Tests, WBTs). Option 3 is excluded because WBTs tend to be more accurate and easier to implement than controlled cooking tests, and WBTs can use a default for the original efficiency (thus efficiency tests only have to be conducted once, on the new stoves). Kitchen Performance Tests are used because they provide an estimate of fuel savings at the household level (versus at the stove level). During monitoring, Options 1 or 2 may be used at the discretion of CPA Implementers or the CME.

Option 1

$$B_{y,savings,i,a} = B_{old,i} - B_{a=1,KPT,i} \times \Delta B_{y,i,a}$$

Where:

| | |
|---|---|
| $B_{old,i}$ | Annual quantity of woody biomass used in the absence of the project activity in tonnes per unit to generate thermal energy equivalent to that provided by the project device type i, if the project device operates throughout the year y. See formulas below for the estimation of $B_{old,i}$ in schools. |
| $B_{a=1,KPT,i}$ | Annual quantity of woody biomass used in tones per device of type *i* for the initial efficiency determined in the year of its installation (a=1) in tonnes per unit, measured as per the Kitchen Performance Test (KPT) protocol. The KPT should be carried out in accordance with national standards (if available) or international standards or guidelines. |

$\Delta B_{y,i,a}$ Factor to consider the efficiency loss of the project device type i due to its aging at the year y, expressed as follows:

$$\Delta B_{y,i,a} = \frac{B_{a,i,KPT}}{B_{a=1,i,KPT}}$$

where $B_{a,i,KPT}$ is the biomass consumption of the device '*i*' with age '*a*' determined using the KPT (in tonnes per year per device) and $B_{a=1,i,KPT}$ is the biomass consumption of the device at its first year of operation. $\Delta B_{y,i,a}$ may be determined through sample surveys of project device type *i* for batches of stoves with the same age at each year of the crediting period. Alternatively, the monitoring may determine annually the biomass consumption of the devices installed at the first year of the crediting period, through the crediting period and the efficiency loss of this population may be used to correct the initial efficiency of the population of stoves installed later on . For example, the loss rate of year 2016 for the project device of type *i* installed in 2015 can be considered the same as that of year 2014 for the project device of the same type installed in 2013. In this way, the monitoring at any year *y* during the crediting period will consist of the determination of the biomass consumption for the devices installed during the current year (the initial value $B_{a=1,i,KPT}$ for the population commissioned during this year), and the values of $B_{a,i,KPT}$ and of $\Delta B_{y,i,a}$for oldest population (i.e. the devices from the first year that have now reached the age a=y)

Option 2 (Note that either equation below may be used).

$$B_{y,savings,i,a} = B_{old,i} \times (1 - \frac{\eta_{old}}{\eta_{new,i,a=1} \times \Delta\eta_{y,i,a}})$$

$$B_{y,savings,i,a} = B_{y=1,new,i,survey} \times (\frac{\eta_{new,i,a=1} \times \Delta\eta_{y,i,a}}{\eta_{old}} - 1)$$

Where:

$B_{y=1,new,i,survey}$ Annual quantity of woody biomass used by project devices in tonnes per device of type i, determined in the first year of the introduction of the devices (e.g. during the first year of the crediting period, y=1) through a sample survey[56]

[56] Sample surveys to estimate this parameter, that are solely based on questionnaires or interviews (i.e. that do not implement measurement campaigns) may only be used if the following conditions are satisfied:

(a) Pre-project devices have been completely decommissioned and only efficient project devices are exclusively used in the project households;
(b) If multiple devices are used in the project, it is possible from the results of the survey questions to clearly differentiate the quantity of woody biomass being used by each device. In other words, if more than one device, or another device that consumes woody biomass, are in use in project households, then the sample survey needs to distinguish the quantity of biomass used by the project device and the other devices that use biomass.

$B_{old,i}$ Same as for Option 1 (KPTs). A default value of 0.5 tonnes woody biomass per capita per year may be used as per AMS-II.G version 6 paragraph 19 c. The household occupancy shall be determined based on literature or sample surveys conducted (see monitoring plan below).

$\eta_{old}$ The Methodology default value for three stone fires and traditional pot supports is selected (a default value of 0.10 may be optionally used if the pre-project device is a three stone fire using firewood (not charcoal), or a conventional device with no improved combustion air supply or flue gas ventilation, that is without a grate or a chimney; for other types of devices, including traditional charcoal stoves, a default value of 0.2 may be optionally used )

$\eta_{new,i,a=1}$ Thermal efficiency of the device of type i being deployed as part of the project activity (fraction), using the water boiling test (WBT) protocol carried out in accordance with national standards (if available) or international standards or guidelines,[57] for the initial efficiency determined in the year of its installation (a=1).

$\Delta\eta_{y,i,a}$ Factor to consider the efficiency loss of the project device type i due to its aging at the year y, as expressed as follows:

$$\Delta\eta_{y,i,a} = \frac{\eta_{new,i,a}}{\eta_{new,i,a=1}}$$

Where $\eta_{new,i,a}$ is the thermal efficiency of the device 'i' with age 'a' determined using the WBT and $\eta_{new,i,a=1}$ is the thermal efficiency of the device at its first year of operation. $\Delta\eta_{y,i,a}$ may be determined through sample surveys of project device type i for batches[58] of stoves with the same age at each year of the crediting period. Alternatively, the monitoring may determine annually the thermal efficiency of the devices installed at the first year of the crediting period, and the efficiency loss of this population may be used to correct the initial efficiency of the population of devices installed later on. For example, the loss rate of year 2016 for the project device of type i installed in 2015 can be considered the same as that of year 2014 for the project device of the same type installed in 2013. In this way, the monitoring at any year y during the crediting period will consist of the determination of the thermal efficiency for the devices installed during the current year (the initial value $\eta_{new,i,a=1}$ for the population commissioned during this year), and the values of $\eta_{new,i,a}$ and of $\Delta\eta_{new,i,a}$ for oldest population (i.e. the devices from the first year that have now reached the age a=y)

[57] In all cases the testing protocol shall be the same for both the device being replaced and the device being deployed.

[58] A batch is defined as the population of the device of the same type installed at a certain calendar year. All the devices in the same batch will be considered as having the same date of commissioning as 1st January of the calendar year.

Schools $B_{old,i}$ calculations:

The schools baseline needs to be adjusted for the number of individual meals served during the monitoring period. The formula used to estimate $B_{old,i}$ for schools is the following:

$B_{old\ (schools)}$= 0.28 kg/individual meal* $IM_y$

Where:

$IM_y$ is the total number of individual meals served in schools during the monitoring period

Adjustment to baseline to account for the use of multiple stoves

For the purposes of calculating ex-ante emission reductions an adjustment factor has to be applied to $B_{old,i}$ to exclude woody biomass consumption of baseline devices that may continue to be in use (as per paragraph 22 of AMS-II.G version 6). This adjustment factor is the fraction of $B_{old,i}$ that can be attributed to the project ICS ($M_{y,i}$). $B_{old,i}$ will be multiplied by $M_{y,i}$ to come up with $B_{old,adjusted,i}$, which is the baseline value that can be attributed to a single project device. This parameter is used to calculate $B_{y,savings,i,a}$ as follows:

$$B_{y,savings,i,a} = B_{old,adjusted,i} \times \left(1 - \frac{\eta_{old}}{\eta_{new,i,a=1} \times \Delta\eta_{new,i,a}}\right)$$

Parameters $\eta_{old}$, $\eta_{new,i,a=1}$ and $\Delta\eta_{new,i,a}$ are the same as those described above.
and

$$B_{old,adjusted,i} = B_{old,i} \times M_{y,i}$$

$B_{old,i}$ is the same as described above.

$M_{y,i}$ Fraction of $B_{old,i}$ that can be attributed to the project ICS (see Part II Section B.7.1 for more details on this parameter).

In order to account for stoves which have been in operation for fractions of the monitoring period (applicable to options 1 and 2), the following formula is used:

$$N_{y,i,a} = T_{y,i} \times \sum_{j=1}^{J_y} n_{j,i,a} \times t_{y,j}$$

Where:

$N_{y,i,a}$ Total number of stoves in operation of type *i* and age *a* for a full monitoring period equivalent within each SSC-CPA

$n_{j,i,a}$ Number of ICS of type *i* and age *a* in the CPA records during monitoring period *y* having been deployed for j days

| | |
|---|---|
| *j* | days since installation or distribution of the ICS (or start date of monitoring period for ICS installed/distributed in prior monitoring periods), until end of monitoring period |
| $t_{y,j}$ | Fraction of monitoring period *y* that the stove is in operation ($t_{y,j} = j/J_y$). Note, for ICS installed in prior monitoring periods $t_{y,j} = 1$. |
| $J_y$ | Total number of days in the monitoring period *y* |
| $T_{y,i}$ | Fraction of stoves of type *i* that continue to be in operation and that remain eligible under each SSC-CPA. |

As specified in the AMS II.G (version 6) methodology, $B_{old,i}$ is determined by using one of the following two options:

a) Calculated as the product of the number of systems multiplied by the estimated average annual consumption of woody biomass per appliance (tonnes/year). This can be derived from historical data or a survey of local usage,

Or

b) Calculated from the thermal energy generated in the project activity as:

$$B_{old,i} = \frac{HG_{p,y}}{NCV_{biomass} * \eta_{old}}$$

The project proponents select option (a) above to determine $B_{old,i}$.

For each SSC-CPA, certain parameters indicated in the methodology for the calculation of emissions are fixed. Default values have been selected for the following parameters:

1. $NCV_{biomass}$ The IPCC default value is selected, as indicated in the methodology (0.015 TJ/tonne) put in unit
2. $EF_{projected\_fossilfuel}$ The IPCC default value is selected (81.6 TCO2/TJ)
3. $\eta_{old,}$ The methodology default value for 3-stone fires and traditional pot supports is selected (0.10 if the pre-project device is a three stone fire using firewood (not charcoal), or a conventional device with no improved combustion air supply or flue gas ventilation, that is without a grate or a chimney; for other types of devices, a default value of 0.2 may be optionally used) The 0.95 leakage adjustment factor is applied in line with AMS II.G version 6.

The following parameters have been assessed by independent experts or proposed by the CDM, using appropriate assessment techniques:

1. $f_{NRB,y}$ The fraction of woody biomass saved by the project activity that can be established as non-renewable biomass. This has been established on EB 67 Annex 22 as 0.96 where the source of the data is the Food and Agriculture Organization of the United Nations.
2. $B_{old,i}$ The average quantity of woody biomass used per stove in the absence of the project in three stove fires or traditional pot supports. This is derived from baseline surveys conducted in Haiti by independent consultants. Baseline household wood fuel usage has been surveyed across Haiti for a national estimate that was found to be homogenous (see baseline reports attached to this PoA-DD).
3. $\eta_{new,i,a=1}$ The efficiency of the new appliance (ICS). The thermal efficiency of ICS used in each CPA will meet or exceed the 20% minimum thermal efficiency

required by AMS II.G Version 6 as certified by a national standards body or an appropriate certifying agent recognized by it, or by manufacturers specifications, before CPA inclusion.

## B.7. Application of the monitoring methodology and description of the monitoring plan

### B.7.1. Data and parameters to be monitored by each generic CPA

| **Data / Parameter:** | $T_{y,i}$ |
|---|---|
| Data unit: | Percentage (or fraction) |
| Description: | Percentage of stoves of type i still in operation during the monitoring period and that remain eligible as determined by monitoring surveys. This includes total number of stoves of type *i* distributed/installed in the entire CPA or the stoves of type *i* for which emissions reductions are to be claimed. Eligible stoves are those located in households or units that are target of the CPA and whose emissions reductions can be accounted for (e.g. baseline has to be applicable), have agreed to cede all CER rights to the CME and use stoves which have not had purposeful alterations that the CME or CPA Implementer believes can materially impact thermal efficiency, and thus the CME or CPA Implementer wish to exclude from emissions reductions calculations. |
| Source of data: | Monitoring surveys which will include an interview to the user and visual inspection of the premises to check if the ICS is operational and in use. |
| Value(s) applied | To be determined. Estimated to be 88% of the stoves distributed for the purposes of exemplifying sample size calculations of newer stoves (aged 0-1 years). |
| Measurement methods and procedures: | The percentage of stoves of type *i* found to be still in operation based on the sampling plan in each monitoring period will be applied to the total number of stoves distributed/installed in each CPA (according to the ICS registration records in the monitoring database and the applicable sample frame). If based on the sample size selected in any monitoring period, the confidence/precision requirements set out in EB 74 Annex 6 or AMS-II.G version 6 are not satisfied, then CPA implementers will follow the procedures outlined in the Monitoring Plan (B.7.2 of the PoA-DD) to ensure the required level of confidence/precision is met or appropriate conservative values as defined by AMS II.G Version 6 are used. |
| Monitoring frequency: | Annually |
| QA/QC procedures: | The unique serial number of each stove shall be logged in the monitoring database showing the total number of stoves. Data from the sampling plan will be collected in each monitoring period by trained project staff and applied in the emissions reductions calculations. Internal cross-checks by the CME or CPA implementer will be undertaken as QC. |
| Purpose of data | Calculation of baseline and project emissions |
| Additional comment: | Stoves which have been transported outside the project area or the area targeted for sampling in a given monitoring period will not be counted for emissions reductions calculations, even if these stoves continue to be in operation. These ICS will be accounted for in the calculation of the percentage of stoves found to be still in operation. See section B 7.2 for more detail on monitoring procedures. |

| **Data / Parameter:** | $B_{y=1,new,i,survey}$ |
|---|---|
| Data unit: | Tonnes per device |
| Description: | Annual quantity of woody biomass used during the project activity in tonnes per device, determined through a survey. The quantity of woody biomass would measured in a sample of households with an operational ICS of a given type. |
| Source of data: | Surveys |
| Value(s) applied | This will be a monitored parameter, so will only be available ex-post. |

| | |
|---|---|
| Measurement methods and procedures: | See section B 7.2 for more detail on monitoring procedures. |
| Monitoring frequency: | Annually |
| QA/QC procedures: | The unique serial number of each stove shall be logged in the monitoring database showing the total number of stoves. Data from the sampling plan will be collected in each monitoring period by trained project staff and applied in the emissions reductions calculations. Internal cross-checks by the CME or CPA implementer will be undertaken as QC. |
| Purpose of data | Calculation of baseline and project emissions |
| Additional comment: | See section B 7.2 for more detail on monitoring procedures. |

| | |
|---|---|
| **Data / Parameter:** | $M_{y,i}$ |
| Data unit: | Fraction |
| Description: | Fraction of $B_{old,i}$ that can be attributed to the project ICS. This parameter would be measured in a sample of units with an operational ICS of a given type. The value of the parameter can be calculated as the inverse of the average number of stoves per unit (household or school) or as the fraction of cooking episodes that take place in the project ICS. The fraction of cooking episodes that take place in the project ICS can be estimated as the average number of times each ICS burner is used in a day/week divided by the total number of times all burners in a given unit are used per day/week. Alternatively, the amount of time cooked in the ICS per day/week divided by the amount of time cooked in all of the unit's burners per day/week can be used to estimate parameter $M_{y,i}$. The value ICS is calculated for every unit monitored and then averaged for the entire sample to come up with the $M_{y,i}$ value. |
| Source of data: | Surveys which will include an interview to the user and visual inspection of the premises to check if the number of stoves in operation is same as reported by users. |
| Value(s) applied | This will be a monitored parameter, so will only be available ex-post. |
| Measurement methods and procedures: | See section B 7.2 for more detail on monitoring procedures. |
| Monitoring frequency: | Annually |
| QA/QC procedures: | The unique serial number of each stove shall be logged in the monitoring database showing the total number of stoves. Data from the sampling plan will be collected in each monitoring period by trained project staff and applied in the emissions reductions calculations. Internal cross-checks by the CME or CPA implementer will be undertaken as QC. |
| Purpose of data | Calculation of baseline and project emissions |
| Additional comment: | See section B 7.2 for more detail on monitoring procedures. |

| | |
|---|---|
| **Data / Parameter:** | $t_{y,j}$ |
| Data unit: | Fraction |
| Description: | Fraction of monitoring period the stove is in operation (days in operation/total days in monitoring period) |
| Source of data: | ICS registration data in monitoring database and length of monitoring period |
| Value(s) applied | For the purposes of calculating ex-ante emission reductions, assumption is 1.0. |
| Measurement methods and procedures: | The fraction will be calculated by dividing the number of days from the registration date of the stove, or the start date of the monitoring period (whichever is later), until the end of the monitoring period by the total number of days in the monitoring period. |
| Monitoring frequency: | Annually |

| | |
|---|---|
| QA/QC procedures: | The unique reference number of each stove shall be logged in the monitoring database. The date of registration shall be utilized to determine the portion of the monitoring period that the stove has been in operation. Any interruption in the stoves' operation (e.g. where stoves are replaced or drop out) will register as missed operating time in the monitoring database for emissions calculation purposes. |
| Purpose of data | Calculation of project emissions |
| Additional comment: | |

| **Data / Parameter:** | $n_{j,i,a}$ |
|---|---|
| Data unit: | Number |
| Description: | Number of ICS of type *i* and age *a* in monitoring period *y* deployed for *j* days |
| Source of data: | ICS registration data in monitoring database |
| Value(s) applied | For the purposes of calculating ex-ante emission reductions, assumption is 79,473. |
| Measurement methods and procedures: | The total number of stoves will be counted from database records. |
| Monitoring frequency: | Annually |
| QA/QC procedures: | The unique reference number of each stove shall be logged in the monitoring database. Spot and duplicate checks on the database will ensure that the number of stoves is accurately represented. |
| Purpose of data | Calculation of baseline project emissions |
| Additional comment: | |

| **Data / Parameter:** | $\eta_{new,i,a}$ |
|---|---|
| Data unit: | Fraction |
| Description: | Continuing efficiency of ICS of type i |
| Source of data: | Water Boiling Tests |
| Value(s) applied | CPA-specific. |
| Measurement methods and procedures: | The tests will be coordinated by the CME and undertaken following WBT protocol 3.0 (or more recent version at the discretion of the CME) by the project team or an experienced third party. |
| Monitoring frequency: | Annually. Note that some stove ages may have been monitored in previous years and may therefore not be monitored in a given monitoring period. |
| QA/QC procedures: | The WBT Protocol 3.0 or a more recent version will be used at CME discretion |
| Purpose of data | Calculation of project emissions |
| Additional comment: | The efficiency of ICS may be determined across CPAs using the same stove model and same age. It is important to note that $\eta_{new,i,a}$ and hence the thermal efficiency test must take into consideration --and be conducted for-- each ICS age (including the year of installation of a=1). The proportion of stoves of each age monitored must be the same proportion of stoves of that age in the database as per the Guidelines for Sampling and Surveys in CDM Project Activities and Program of Activities (EB 75 Annex 8). However, the result of a sampling of the first batch may be used as a proxy to subsequent batches (e.g. the efficiency in year 4 for the batch installed in year 1 could be used for the efficiency in year 5 for the batch installed in year 2). See parameter $Dh_{new,i,a}$ for further explanation of this procedure.<br>See section B 7.2 for more detail on monitoring procedures |

| **Data / Parameter:** | $\Delta h_{new,i,a}$ **and** $\Delta B_{y,i,a}$ |
|---|---|
| Data unit: | -- |
| Description: | Factor to consider the efficiency loss of the project device type *i* due to its aging at the year *y*. |

| | |
|---|---|
| Source of data: | Parameters $h_{new,i,a}$ and $B_{a,i,KPT}$ |
| Value(s) applied | CPA and stove age specific |
| Measurement methods and procedures: | $\Delta\eta_{new,i,a} = \frac{\eta_{new,i,a}}{\eta_{new,i,a=1}}$ or $\Delta B_{y,i,a} = \frac{B_{a,i,KPT}}{B_{a=1,i,KPT}}$<br>Where $\eta_{new,i,a}$ /$B_{a,i,KPT}$ is the thermal efficiency/annual quantity of biomass used of the device 'i' with age 'a' determined using the WBT/KPT and $\eta_{new,i,a=1}$ / $B_{a=1,i,KPT}$ is the thermal efficiency/annual quantity of biomass used of the device at its first year of operation. $\Delta\eta_{new,i,a}$ /$DB_{y,i,a}$ may be determined through sample surveys of project device type i for batches[59] of stoves with the same age at each year of the crediting period. Alternatively, the monitoring may determine annually the thermal efficiency/annual quantity of biomass used of the devices installed at the first year of the crediting period, and the efficiency loss of this population may be used to correct the initial efficiency of the population of devices installed later on. For example, the loss rate of year 2016 for the project device of type i installed in 2015 can be considered the same as that of year 2014 for the project device of the same type installed in 2013. In this way, the monitoring at any year y during the crediting period will consist of the determination of the thermal efficiency for the devices installed during the current year (the initial value $\eta_{new,i,a=1}$ / $B_{a=1,i,KPT}$ for the population commissioned during this year), and the values of $\eta_{new,i,a}$ / $B_{a,i,KPT}$ and of $\Delta\eta_{new,i,a}$ / $DB_{y,i,a}$ for oldest population (i.e. the devices from the first year that have now reached the age a=y) |
| Monitoring frequency: | Annually |
| QA/QC procedures: | Quality procedures applied to data sources. See parameter $h_{new,i,a}$ and $B_{a,i,KPT}$. |
| Purpose of data | Calculation of project emissions |
| Additional comment: | |

| **Data / Parameter:** | $B_{a,i,KPT}$ |
|---|---|
| Data unit: | Tonnes per annum |
| Description: | Annual quantity of woody biomass used during the project activity in tonnes per device of type i with the age *a* |
| Source of data: | Kitchen Performance Tests |
| Value(s) applied | To be determined. Value is variable and dependent on performance of the stove model implemented under a CPA. |
| Measurement methods and procedures: | A survey, elaborated in accordance to the Kitchen Performance Test protocol, will be conducted in accordance to the procedures outlined in section B.7.2. The survey will ask households about woody biomass consumption over a period or 4 days (or as specified in the more recent version of the Kitchen Performance Test protocol). Data obtained from the survey will be analyzed by the CME or CPA Implementer according to the KPT protocol guidelines. |
| Monitoring frequency: | Annually. Note that some stove ages may have been monitored in previous years and may therefore not be monitored in a given monitoring period. |

[59] A batch is defined as the population of the device of the same type installed at a certain calendar year. All the devices in the same batch will be considered as having the same date of commissioning as 1st January of the calendar year.

| | |
|---|---|
| QA/QC procedures: | The Kitchen Performance Test protocol version 3.0 or more recent (or more recent version at the discretion of the CME) with surveys implemented by trained project team members or an experienced third party. |
| Purpose of data | Calculation of project emissions |
| Additional comment: | If the parameter has been estimated already for households with stoves of age *a*, then it does not need to be estimated again in households with stoves of the same age. See section B.7.2 for more detail on monitoring procedures. |

| **Data / Parameter:** | $IM_y$ |
|---|---|
| Data unit: | Number of individual meals |
| Description: | The total number of individual meals served in project schools during the monitoring period. |
| Source of data: | Surveys |
| Value(s) applied | To be determined. Value is variable and dependent staffing and student enrolment in any given school during the monitoring period. |
| Measurement methods and procedures: | See section B 7.2 for more detail on monitoring procedures. |
| Monitoring frequency: | Annually |
| QA/QC procedures: | The total number of schools which have stoves from this PoA will be recorded in the database. The surveys will then be implemented in a representative sample of schools. When possible, the survey records will be corroborated with school records. |
| Purpose of data | Calculation of baseline and project emissions |
| Additional comment: | See section B.7.2 for more detail on monitoring procedures. |

| **Data / Parameter:** | *HO* |
|---|---|
| Data unit: | Household occupancy or number of people per household |
| Description: | Total number of people living in a household |
| Source of data: | Surveys |
| Value(s) applied | To be determined. Value is variable and dependent on local and customer population characteristics. |
| Measurement methods and procedures: | See section B 7.2 for more detail on monitoring procedures. |
| Monitoring frequency: | Annually |
| QA/QC procedures: | Household occupancy will be recorded in the database. The surveys will then be implemented in a representative sample of households. Survey information will be screened for errors and a fraction of the records verified in the field. |
| Purpose of data | Calculation of baseline and project emissions |
| Additional comment: | Note that in case government census data becomes available on the household size of HO sample frames, monitoring of parameter HO will not be required and project implementers can choose to apply the value of the census. See section B.7.2 for more detail on monitoring procedures. |

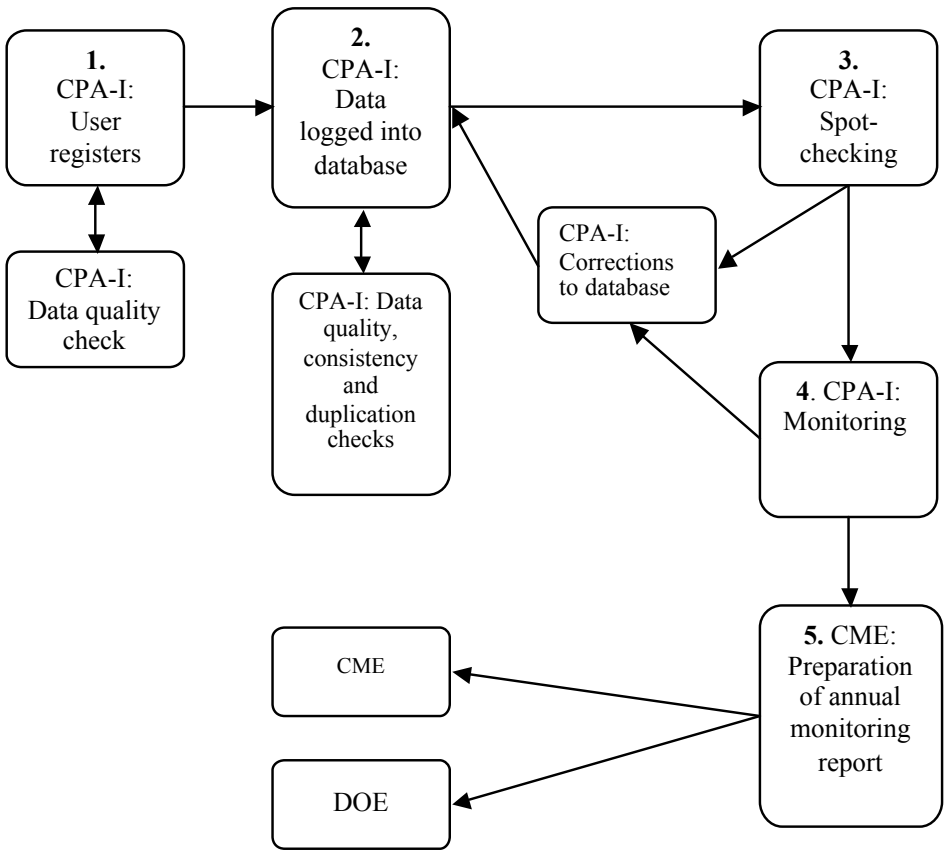
### B.7.2. Description of the monitoring plan for a generic CPA

The Monitoring Plan applied in this PoA involves a number of key elements that ensure that the CME and CPA-Implementer have high-quality, unbiased and reliable information regarding the performance of the project in terms of implementation and outcomes, and for the purposes of calculating Certified Emission Reductions (CERs) following AMS II.G

version 6.0 on the basis of the amount of non-renewable biomass saved by the ICS in the project activity. The key elements are the following:

- Data collection procedures
- Distribution and Monitoring Database
- Spot Checking of ICS (ongoing)
- Sample Plan for the Monitoring Survey
- Data Quality, Consistency and Duplication Checks
- Monitoring Reporting

The below flow-chart illustrates the roles and responsibilities of the parties during the implementation of the monitoring plan for the SSC-CPA. In the below flowchart, the CPA implementer is abbreviated to “CPA-I”, and can be CQC or another party authorized by the CME. CQC is the CME.




Below is the description of the above steps on the flow-chart.

1. **CPA-I: User registers stove:** CPA implementer will collect/receive the necessary information requested on the Registration Card from the user. Means of collecting this information may be through a physical Registration Card filled by CPA-Imp staff, retailers, end-users or partner organization's staff, or through the use of ICTs or SMS. CPA Implementers' staff shall double check the accuracy of information provided, and request for field staff additional clarifications if needed;
2. **CPA-I: Data logged into database:** CPA implementer trained staff will input the data in the database either manually (if data collected from physical Registration Card) or this will be automatically input if data was collected using ICTs or SMS. CPA implementer staff shall double check the information included on the database and check for duplications. Any duplicate information shall be investigated and errors corrected or excluded from the database if it is a true duplicate entry.
3. **CPA-I: Spot- checking (ongoing):** CPA implementer field staff will randomly select units included in the database and visit or contact the stove users to cross-check the information on the database with the factual evidence in the field. Any inconsistencies found (eg. change in the address of a user) will be updated on the database , and in the case ICS are found to be no longer in use, they will be clearly marked as such and excluded from emission reductions calculations.
4. **CPA-I: Monitoring:** CPA implementer will follow the requirements as per POA-DD to collect the necessary information for a monitoring report.
5. **CME: Preparation of monitoring report:** the CPA implementers or the CME will prepare the final monitoring report to be provided to the verifier DOE for verification of emission reductions. A copy of the monitoring report will remain with the CME.

The CME will coordinate and manage each CPA Implementer and assist them in implementing each element of the monitoring plan. Monitoring plan shall be elaborated in accordance with the Sampling Plan below.

**Sampling plan:**

(a) *Sampling Design*

Due to the large number of ICS envisioned to be distributed as part of the CPAs to be included in the PoA, it is not economically feasible to monitor each individual ICS unit distributed. Therefore, representative sampling will be undertaken as part of a PoA-wide Sampling Plan (by grouping and sampling across CPAs) that is designed in line with the requirements of the Standard for Sampling and Surveys for CDM Project Activities and Programme of Activities version 3.0 (EB 74 Annex 6).

Samples will be drawn from ICS recorded in a database (or databases) administered by the CME or made available to the CME by CPA Implementers. These database records are referred to as CME records database or Database. A detailed explanation of this database is found in Section C (Management system) of this PoA-DD.

(b) *Objectives and Reliability Requirements:*

The objective is to obtain an unbiased and reliable estimate of the proportion or mean value of monitoring parameters over the course of the crediting period , and with 95/10 confidence/precision (as per paragraph 20 of EB 74 Annex 6) for annual and a proposed 95/5 for biennial sampling across CPAs.[60] In case a single CPA is sampled, 90/10 confidence/precision for annual and 95/10 confidence/precision shall be required for biennial sampling (as per Methodology AMS-II.G version 06). As per the AMS-II.G version 6 paragraph 39, "in cases where survey results indicate that 90/10 precision or 95/10 precision are not achieved, the lower bound of the 90% or 95% confidence interval of the parameter value may be chosen as an alternative to repeating the survey efforts to achieve the 90/10 or 95/10 precision." However, the use of the use of the lower bound of the confidence interval shall only be used when a single CPA is sampled (versus sampling across CPAs). Alternatively, the CME may choose to apply the provision in paragraph 16 (b) (i) b of the Standard for Sampling and Surveys in CDM Project Activities and Programme of Activities Version 4. The provision allows for "discounting by no less than 3 times (x3) the percentage precision points missed (e.g. if the attained precision is 90/11 then the emission reduction estimates are discounted by 3 percent). The use of this provision shall also be used when a single CPA is sampled (versus sampling across CPAs).

Monitored Parameters

| Parameter | Description of Parameter |
|---|---|
| $T_{y,i}$ | Proportion of ICS still in operation |
| $M_{y,i}$ | Fraction of $B_{old,i}$ that can be attributed to the project ICS |
| $\eta_{new,i,a}$ | Thermal Efficiency of operational ICS |
| $B_{y=1,new,i,survey}$[61] | Annual quantity of woody biomass used during the project activity in tonnes per device |
| $B_{a,i,KPT,i}$ | Annual quantity of woody biomass used in year y in tonnes per |

[60] The 95/5 confidence/precision levels are higher than the precision levels outlined in the Standard for Sampling and Surveys and AMS-II.G version 6 methodology. $\eta_{new,i,a}$ shall be measured annually if applicable (i.e. if the age of the monitored ICS has not been monitored in previous monitoring periods).

[61] This parameter will only be monitored in case a baseline is not available for the target population of the CPA.

| | |
|---|---|
| | unit |
| $IM_y$ | Total number of individual meals served in schools during the monitoring period. |
| *HO* | Household Occupancy |

(c) *Target Population*

- The target population for the proportion of ICS still in operation ($\boldsymbol{T_{y,i}}$ ) are the stoves in the CME database records (still in operation or not) for which emissions reductions are to be accounted in the monitoring period in question.
- The target population for the fraction of $B_{old,i}$ that can be attributed to the project ICS ($\boldsymbol{M_{y,i}}$) are units with operational ICS in the CME records database for which emissions reductions are to the accounted in the monitoring period in question.
- The target population for efficiency of new appliances ($\boldsymbol{\eta_{new,i,a}}$) is the set of stoves still in operation in the CME records database for which emissions reductions are to the accounted in the monitoring period in question.
- The target population of the annual quantity of woody biomass used during the project activity in tonnes per device ($\boldsymbol{B_{y,new,survey,i}}$) is the set of households with ICS in operation in the CME records database for which emissions reductions are to the accounted in the monitoring period in question and for which a baseline approved under this PoA is not available.
- The target population of the annual quantity of woody biomass used during the project activity in tonnes per unit ($\boldsymbol{B_{y,new,KPT,i}}$) is the set of households with ICS in operation in the CME records database for which emissions reductions are to the accounted in the monitoring period in question and for which the selected monitoring procedure is the Kitchen Performance Test.
- The target population for the number of individual meals served in schools during the monitoring period ($\mathbf{IM_y}$) are the schools in the database which have an ICS from the PoA.
- The target population for household occupancy (HO) are the households where a default value of 0.5 tonnes of woody biomass per capita per year will be used to estimate parameter $B_{old,i}$.

(d) *Sampling Frame*

Four sampling frames shall be defined:

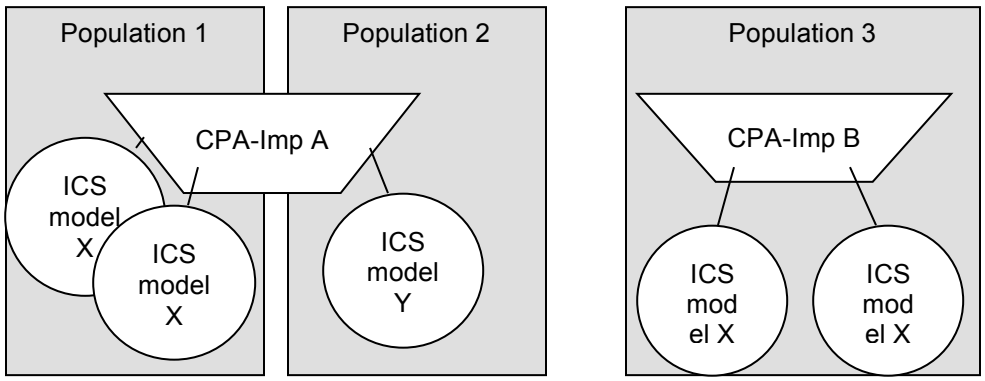
(i) Sampling frame for proportion of ICS still in operation ($\boldsymbol{T_{y,i}}$), the fraction of $B_{old,i}$ that can be attributed to the project ICS ($\boldsymbol{M_{y,i}}$), the annual quantity of biomass used by project devices ($\boldsymbol{B_{y=1,new,survey,i}}$), and the annual quantity of woody biomass used in year y in tonnes per unit ($\boldsymbol{B_{a,i,KPT,i}}$).

The PoA is open to different CPA Implementers and different models of ICS targeted to different sectors (households, schools, and street food-vendors), and fuels (charcoal and fuel-wood). To account for these differences, the first step is to identify homogeneous populations among the ICS population contained in the Database. In specific, homogeneous populations are CPAs which have:

1. The same CPA Implementer
2. The same ICS model
3. The same target sector (charcoal-using households, firewood-using households; schools or street-food vendors)
4. The same stove age

Ie. CPAs with the same CPA Implementer, same ICS model and age, and targeting the same sector can therefore be grouped together into a single homogeneous ICS population. In the event the POA has CPAs with two different CPA Implementers using the same ICS model of the same age in the same target sectors, these will form two distinct populations. Same is true if the same CPA Implementer has two different ICS models of the same age being implemented in the same target sector– this will form two distinct populations. The same holds true if two different ages of the same stove model are being distributed: these will form two different populations. Finally, two distinct populations will be formed if the same CPA Implementer is distributing the same ICS model of the same age in two different target sectors.

The below schematics illustrate the example used above, and assuming a single stove age, target population and fuel type is selected. This is justified by the fact that CPA Implementer might vary in terms of performance and it is important for the CME to collect and monitor accurate data for each CPA Implementer distributing each ICS model.



(ii) Thermal Efficiency of operational ICS ($\eta_{new,i,a}$)

The thermal efficiency of operational ICSs may vary across model and age, but not within different CPA Implementers. Hence, for parameter $\eta_{new,i,a}$, samples will be stratified in groups of ICSs of the same model , same age,[62] and targeting the same sector and fuel type.

(iii) Number of individual meals served in schools

Since the number of meals served in schools is independent of the CPA Implementer and stove age or model, sampling of parameter $IM_y$ shall not be stratified. Therefore, the target population of these samples are all schools in the CME or CPA Implementer records which have improved cookstoves deployed as part of this PoA.

(iv) Household occupancy (HO)

Since household occupancy is not expected to vary according to project device age, model or CPA Implementer, the sampling frame for this parameter will be households in the same type of location (i.e. rural or urban) and using the same type of primary fuel (charcoal or wood). As a result, there are 3 possible sample frames: rural wood users, rural charcoal users, and urban wood users. A $B_{old,i}$ value for urban charcoal users has been estimated and therefore monitoring this parameters in this population segment is not necessary.

(e) *Sampling Method*

The sampling method for all monitoring parameters, except $IM_y$, will be stratified random sampling where stratification shall be done according to the parameters in each of the sampling frames described above (i.e. CPA Implementer, ICS model, ICS age, and target sector for parameters $T_{y,i}$, $M_{y,i}$, $B_{y=1,new,survey,i}$, and $B_{a,i,KPT}$;ICS model, ICS age, and target sector for $\eta_{new,i,a}$; and location and primary fuel for parameter HO). Since parameter $IM_y$ is homogeneous throughout the schools population, the sampling method for this parameter is simple random sampling.

Separate sampling exercises will be performed for those sampling frames (except for HO) where either the stove model or target sectors are different. This will also be the case for parameters $T_{y,i}$, $M_{y,i}$, $B_{y,new,survey,i}$ and $B_{y,new,KPT,i}$ where the CPA Implementer is different. However, each independent sampling exercise (except for HO) will be stratified by ICS age[63] as exemplified in the sample size calculations below. In the case of parameter HO, separate sampling exercises will be performed for each sampling frame.

A. Stratified Random Sample

Some sample size calculations will take into consideration differences in stove age. The proportions of ICS from different stove ages in the sample will be the same as the proportions in the population. Separate sample size calculations shall be established if

[62] The age of the stove is the number of years a stove has been deployed in the field. Ages shall be grouped in yearly periods. For example, stoves that have been in operation from 0 to 365 days will have the same age (0-1 years); likewise, stoves that have been in operation for 366-730 days will also have the same age (1-2 years).

[63] According to the guidance provided in EB 75 Annex 8 for heterogeneous populations

CPA Implementers (except for parameter $h_{new,i,a}$ where CPA Implementer is unlikely to affect ICS thermal efficiency), stove models, or target sectors vary. The variances and means will be weighted based on the proportions of stoves in each age cohort in the population to estimate sample sizes.

The exemplify stratified random sampling for different ICS ages, the sample size calculations assume monitoring will take place on year 3 of PoA implementation, when three stove ages are present. The following parameters apply to each stove age:

| ICS age | Number of ICS[64] | $T_{y,i}$ mean value | $M_{y,i}$ mean value | $\eta_{new,i,a}$ |
|---|---|---|---|---|
| 0-1 years | 53,040 | 0.88[65] | 0.64[66] | 0.458[67] |
| 1-2 years | 22,195 | 0.69[68] | 0.71 | 0.448 |
| 2-3 years | 4,238 | 0.5[69] | 0.58 | 0.438 |

To ensure random selection of the units, the ICS in the population of each age will be numbered sequentially starting at 1 and up to the number of ICS in the population of that age. Random numbers in the range of 1 to the total number of stoves in the population of that age will then be drawn to select stoves up the desired sample size.

*Sample size calculation*

The calculation of the required sample size for each parameter in the year 3 monitoring period is illustrated below for a 95/10 level of confidence and precision, given that multiple CPAs would have to be included to accommodate the ICS population of all age cohorts mentioned above. It is assumed in all calculations that the population size is 79,473, as per the table above.

Sample sizes for proportional parameters:

[64] Numbers based on distribution schedule outlined in section A of the PoA-DD.

[65] The value is based on pilot studies of similar projects where the CME of this PoA is project participant (Distribution of ONIL Stoves – Mexico and Distribution of ONIL Stoves – Guatemala). The values available to the CME at the time of submission of this document varied between 0.86 and 0.90. These values were collected in the first years of stove operation. The mid-value of this range (0.88 = (0.86+0.90)/2) is used for the purpose of exemplifying sample size calculations in this PoA. The value may be updated to estimate sample sizes according to more recent or relevant (e.g. same country, sector/fuel, and ICS model) pilot studies

[66] Value obtained from baseline exercise and is the inverse of the average number of stoves per household. This value is not expected to change during the operational life of the stove, so values for age cohorts 1-2 and 2-3 are simply 10% above and below average value to exemplify variation in the parameter (and thus, how weighted averages would be computed).

[67] Efficiency of one of ICS types in first CPA. Stove efficiency is assumed to decline by 2.21% from value of previous year. This assumption is based on tests conducted in a PoA where CQC is CME.

[68] Mid value between ICS adoption rate when stoves are new (age 0-1) and "best guess" (see footnote below) after 3 years of ICS operation.

[69] Following EB 75 Annex 8 paragraph 5(c), value reflects researcher's "best guess" after conducting monitoring for other ICS PoAs.

The estimation of sample sizes for the proportional parameter ($T_{y,i}$) will require the following formula:[70]

$$n \geq \frac{z^2 \times N \times \bar{p} \times (1-\bar{p})}{(N-1) \times precision^2 \times \bar{p}^2 + z^2 \times \bar{p} \times (1-\bar{p})}$$

Where:

| | |
|---|---|
| n | Sample Size |
| N | Total number of ICS in the population |
| $\bar{p}$ | The value of the proportional parameter of interest (in this case $T_{y,i}$) weighted based on the proportion of ICS ages in the entire population |
| z | Represents the level of confidence required (1.645 for 90% confidence and 1.96 for 95% confidence) |
| *precision* | Required precision (e.g. 10 or 5%) |

Where $\bar{p}$ is calculated as follows:[71]

$$\bar{p} = \frac{\sum_{a=1}^{A} g_a \times p_a}{N}$$

And

| | |
|---|---|
| $g_a$ | is the total number of stoves of age *a* |
| $p_a$ | is the value of the proportion found in stoves of age *a* |
| N | is the total number of stoves in the database distributed by the same CPA Implementer, of the same ICS model and same target sector |
| A | Total number of ages in the population |

Parameter $T_{y,i}$:

Based on the above assumptions, the resulting sample size for a 95/10 confidence/precision is calculated as follows:

Step 1: Calculate the value of the proportion weighted to the fraction of stoves in each age

$$\bar{p} = \frac{53{,}040 \times 0.88 + 22{,}195 \times 0.69 + 4{,}238 \times 0.5}{79{,}473} = 0.807$$

Step 2: estimate the overall sample size

$$n \geq \frac{1.96^2 \times 79{,}473 \times 0.807 \times (1-0.807)}{(79{,}473-1) \times 0.1^2 \times 0.807^2 + 1.96^2 \times 0.807 \times (1-0.807)} = 91.96$$

[70] As per EB 75 Annex 8 paragraph 12 (Equation 1)

[71] As per equation 5 of EB 75 Annex 8. Equation modified for brevity.

Under these assumptions, 92 units with ICS would have to be sampled. If the sample size is smaller than 30, the sample size shall increase to a minimum of 30 as per EB 74 Annex 6, Section IV, paragraph 12 and footnote 15 to approximate a normal distribution.

Step 3: Estimate the number of ICS to sample of each age

The proportions of ICS from different ages in the sample have to be the same as the proportion in the population. To obtain the number of samples of a given age ($n_a$), the total number of samples is multiplied by the proportion of ICS of that age in the population. The following calculations exemplify the process:

$$n_a = \frac{g_a}{N} \times n$$

Where:
$n_a$ is the number of samples of ICS of age a
n is the total number of samples

The following table presents the calculations and number of ICS to sample of each stove age:

| ICS age | Number of ICS ($g_a$) | $g_a/N$ | $g_a$ x n/N[72] |
|---|---|---|---|
| 0-1 years | 53,040 | 0.667 | 62 |
| 1-2 years | 22,195 | 0.280 | 26 |
| 2-3 years | 4,238 | 0.053 | 5 |

Step 4: consideration of non-response rates

Given that survey response rates may be lower than 100% due to several factor (e.g. ICS owners are away from home or cannot respond the survey for any other reason), sample size estimations must take into consideration a lower response rate. To account for this, the sample size of each stove age is divided by the expected (or conservative) response rate. The example below provides an illustration of sample sizes when response rates are 80%:[73]

| ICS age | $g_a$ x n/N[74] | Sample size considering non response rates ($g_a$ x n/N/0.8)[75] |
|---|---|---|
| 0-1 years | 62 | 78 |
| 1-2 years | 26 | 33 |
| 2-3 years | 5 | 7 |

Sample sizes for mean value parameters:

[72] Resulting sample sizes are more than 92 because every age sample size is rounded up.

[73] Based on researcher's best judgement as per EB 75 Annex 8 paragraph 5(c)

[74] Resulting sample sizes are more than 92 because every age sample size is rounded up.

[75] Note that values were rounded to the whole number immediately above

The estimation of the mean value of the thermal efficiency of the stove will use the following equation:[76]

$$n \geq \frac{z^2 \times N \times V}{(N-1) \times precision^2 + z^2 \times V}$$

Where:

$$V = \left( \frac{\overline{SD}}{\overline{mean}} \right)^2 = COV^2$$

| | |
|---|---|
| n | Sample Size |
| N | Total number of ICS in the population |
| z | Represents the level of confidence required (1.645 for 90% confidence and 1.96 for 95% confidence) |
| $\overline{SD}$ | Standard deviation of the sample weighted to the proportion of ICS ages in the entire population $\overline{mean}$ Mean of the sample weighted to the proportion of ICS ages in the entire population |
| COV | Coefficient of variation of the sample (SD/mean) |

Where $\overline{mean}$ and $\overline{SD}$ is calculated as follows:[77]

$$\overline{mean} = \frac{\sum_{a=1}^{A} g_a \times m_a}{N}$$

$$\overline{SD} = \sqrt{\frac{\sum_{a=1}^{A} g_a \times SD_a^2}{N}}$$

And

| | |
|---|---|
| $g_a$ | is the total number of stoves of age *a* |
| $m_a$ | is the mean value found in stoves of age *a* |
| $SD_a^2$ | is the variance of the parameter of interest found in stoves of age *a* |
| N | is the total number of stoves in the database distributed by the same CPA Implementer, of the same ICS model and same target sector |
| A | Total number of ages in the population |

Parameter $\eta_{new,i,a}$:

[76] As per EB 75 Annex 8 paragraph 51 (Equation 18)

[77] As per equation 5 of EB 75 Annex 8. Equation modified for brevity.

To exemplify sample size calculations for parameter $\eta_{new,i,a}$, the following values are used:[78]

- The Coefficient of Variation (COV) of the thermal efficiency of stoves of all ages is 28.08% of the thermal efficiency value.

Step 1: Calculate the mean value and standard deviation weighted to the fraction of stoves in each age

Parameter values at different ages:

| ICS age | ICS thermal efficiency mean value | Variance of the ICS thermal efficiency |
|---|---|---|
| 0-1 | 45.8% | 1.65% |
| 1-2 | 44.8% | 1.58% |
| 2-3 | 43.8% | 1.51% |

Applying those values to the weighted average equations we obtain:

$$\overline{mean} = \frac{45.8\% \times 53{,}040 + 44.8\% \times 22{,}195 + 43.8\% \times 4{,}238}{79{,}473} = 45.4\%$$

$$\overline{SD} = \sqrt{\frac{1.65\% \times 53{,}040 + 1.58\% \times 22{,}195 + 1.51\% \times 4{,}238}{79{,}473}} = 12.8\%$$

Step 2: estimate the overall sample size

Substituting the weighted mean and standard deviation values into the equation for V gives:

$$V = \left(\frac{12.8\%}{45.4\%}\right)^2 = 0.079$$

Applying these values to the equation below and using a 95/10 confidence precision, we obtain:

$$n \geq \frac{1.96^2 \times 79{,}473 \times 0.079}{(79{,}473 - 1) \times 0.1^2 + 1.96^2 \times 0.079} = 30.28$$

The resulting sample size is 31. If the sample size is less than 30, the t-Student distribution shall be used as per EB 74 Annex 6, Section IV, paragraph 12.

Step 3: Estimate the number of ICS to sample of each age

[78] Source of value: Source: Booker, K., Won Han, T., Granderson, J., Jones, J., Lask, K., Yang, N., and Gadgil, A. Performance of Charcoal Cookstoves for Haiti, Part 1: Results from the Water Boiling Test. Lawrence Berkeley National Laboratory, June 2011. Page 20.

The same procedure as for $T_{y,i}$ is applied to ensure the proportions of ICS from different ages in the sample are the same as the proportions in the population. The following table presents the calculations and number of ICS to sample of each stove age:

| ICS age | Number of ICS ($g_a$) | $g_a/N$ | $g_a$ x n/N[79] |
|---|---|---|---|
| 0-1 years | 53,040 | 0.667 | 21 |
| 1-2 years | 22,195 | 0.280 | 9 |
| 2-3 years | 4,238 | 0.053 | 2 |

Step 4: consideration of non-response rates

No-response rates are considered for testing thermal efficiencies since Water Boiling Tests will only be applied to ICS whose users can be found and have agreed to lend/rent/sell to the program. Users who cannot be found or do not want to lend/rent/sell the stoves will be recorded and the CME/CPA Implementer will draw additional random samples as needed until the samples sizes are attained.

Parameter $M_{y,i}$:

The following assumption are used to exemplify sample size calculations for parameter $M_{y,i}$:

- The coefficients of variation of the parameter is constant at different ages and set at 58.8%[80] of the overall $M_{y,i}$ values.

Step 1: Calculate the mean value and standard deviation weighted to the fraction of stoves in each age

Parameter values at different ages:

| ICS age | $M_{y,i}$ mean value | Variance of $M_{y.i}$ |
|---|---|---|
| 0-1 | 0.64 | 0.14 |
| 1-2 | 0.71 | 0.17 |
| 2-3 | 0.58 | 0.11 |

Applying those values to the weighted average equations we obtain:

$$\overline{mean} = \frac{0.64 \times 53{,}040 + 0.71 \times 22{,}195 + 0.58 \times 4{,}238}{79{,}473} = 0.656$$

$$\overline{SD} = \sqrt{\frac{0.14 \times 53{,}040 + 0.17 \times 22{,}195 + 0.11 \times 4{,}238}{79{,}473}} = 0.386$$

Step 2: estimate the overall sample size

[79] Resulting sample sizes are more than 23 because every age sample size is rounded up.

[80] Coefficient of variation found from baseline studies

Substituting the weighted mean and standard deviation values into the equation for V gives:

$$V = \left(\frac{0.386}{0.656}\right)^2 = 0.346$$

Applying these values to the equation above and using a 95/10 confidence precision, we obtain:

$$n \geq \frac{1.96^2 \times 79,473 \times 0.346}{(79,473-1) \times 0.1^2 + 1.96^2 \times 0.346} = 132.78$$

The resulting sample size is 133. If the sample size is less than 30, the t-Student distribution shall be used as per EB 74 Annex 6, Section IV, paragraph 12.

Step 3: Estimate the number of ICS to sample of each age

The same procedure as for other monitoring parameters is applied to ensure the proportions of ICS from different ages in the sample are the same as the proportions in the population. The following table presents the calculations and number of ICS to sample of each stove age:

| ICS age | Number of ICS ($g_a$) | $g_a/N$ | $g_a$ x n/N[81] |
|---|---|---|---|
| 0-1 years | 53,040 | 0.667 | 89 |
| 1-2 years | 22,195 | 0.280 | 37 |
| 2-3 years | 4,238 | 0.053 | 8 |

Step 4: consideration of non-response rates

The example below provides an illustration of sample sizes when response rates are 80%:[82]

| ICS age | $g_a$ x n/N[83] | Sample size considering non response rates ($g_a$ x n/N/0.8)[84] |
|---|---|---|
| 0-1 years | 89 | 112 |
| 1-2 years | 37 | 47 |
| 2-3 years | 8 | 10 |

Parameter $B_{y,new,survey,i}$ and $B_{y,new,KPT,i}$:

[81] Resulting sample sizes are more than 132 because every age sample size is rounded up.

[82] Based on researcher's best judgement as per EB 75 Annex 8 paragraph 5(c)

[83] Resulting sample sizes are more than 132 because every age sample size is rounded up.

[84] Note that values were rounded to the whole number immediately above

To exemplify sample size calculations for parameter $B_{y=1,new,l,survey}$ and $B_{a,i,KPT,i}$,[85] a coefficient of variation of 0.558 is used.[86] This coefficient of variation is the result of dividing the age-weighted standard deviation by the age-weighted mean fuel consumption. The below example assumes that the weighted coefficient of variation (weighted standard deviation/weighted mean value) remains at 0.558. Applying these values to the equation above and using a 95/10 confidence precision, we obtain:

$$V = 0.558^2 = 0.311$$

$$n \geq \frac{1.96^2 \times 79,473 \times 0.311}{(79,473-1) \times 0.1^2 + 1.96^2 \times 0.311} = 119.48$$

The resulting sample size is 120. As for the other monitoring parameters, if the resulting sample size is less than 30, the sample size shall be increased to 30 samples to conform with EB 74 Annex 6 paragraph 12 and footnote 15. In addition, as in the case of other parameters, the proportions of each age in the sample should be equal to the proportions of the ICS age in the overall population. The procedures to obtain weighted standard deviations, means, sample sizes for each age and accounting for non-responses are the same as those mentioned for the other parameters mentioned above (and therefore no longer illustrated here).

B. Simple Random Sampling

Two parameters (the number of individual meals served in schools during the monitoring period ($IM_y$) and household occupancy, HO) will be sampled through the simple random sampling method. The population of this parameter is thought to be homogenous and independent of the stove type, age, and CPA Implementer characteristics, but is dependent on the target sector (schools for $IM_y$ and primary fuel and location for HO). Since IMy is not stratified and sampling for parameter HO is performed independently for each population, a simple random sampling approach is appropriate. Examples of sample size calculations are presented below:

Parameter $IM_y$:

The following assumptions are used to exemplify sample size calculations for parameter $IM_y$:

- The mean value of the parameter is 69,365 individual meals/school/year[87]
- The standard deviation of the parameter is 11,266 individual meals/school/year[88]
- The total number of schools is 490[89]

[85] Parameters are considered equivalent since they measure the same thing: the amount of woody biomass used when project devices are introduced.

[86] The source of this value is the household charcoal consumption baseline study created for this PoA.

[87] This value was obtained through a simulation using mean values and standard deviations found in the schools baseline survey data

[88] Ibid

[89] Number of schools outlined in the list provided by the World Food Program to sample for the schools charcoal consumption baseline

Applying these values to the equation above and using a 90/10 confidence precision, we obtain:

$$V = \left( \frac{11{,}266}{69{,}365} \right)^2 = 0.026$$

$$n \geq \frac{2.16^2 \times 490 \times 0.026}{(490-1) \times 0.1^2 + 2.16^2 \times 0.026} = 12.03$$

The resulting sample size is 13. If the sample size is less than 30, the t-Student distribution shall be used as per EB 74 Annex 6, Section IV, paragraph 12. In this example, the z-value has been adjusted to reflect the t-distribution.

Parameter HO:

The following assumptions are used to exemplify sample size calculations for parameter HO:

- The total number of households for which $B_{old,i}$ is estimated using the default value of 0.5 tonnes of woody biomass per capita per year is 1,000.
- The mean household size is 5.69 people.[90]
- Household size standard deviation is 2.60.[91]

Applying these values to the equation above and using a 90/10 confidence precision, we obtain:

$$V = \left( \frac{2.60}{5.69} \right)^2 = 0.209$$

$$n \geq \frac{1.645^2 \times 1{,}000 \times 0.209}{(1{,}000-1) \times 0.1^2 + 1.645^2 \times 0.209} = 53.49$$

The resulting sample size is 54. If the sample size is less than 30, the t-Student distribution shall be used as per EB 74 Annex 6, Section IV, paragraph 12.

(b) Data

*(i) Field Measurements:*

To monitor the number of stoves that continue to be in use ($\boldsymbol{T_{y,i}}$), the annual quantity of woody biomass used during the project activity in tonnes per device ($B_{y=1,new,i,survey}$ and $B_{a,i,KPT}$), stove thermal efficiency ($\eta_{new,i,a}$), and the fraction of $B_{old,i}$ that can be attributed to project ICS ($M_{y,i}$), the number of individual meals served in schools during the monitoring period ($IM_y$), the data collected will be a representative number of stoves in the database for the monitoring period. The scope is a representative sample of stoves across all

[90] The source of this value is the baseline survey data

[91] Same as above

CPAs with the same CPA Implementer, same ICS model, and target sector. The method of collecting data will be field surveys of required sample size of ICS users in the database. Frequency of data collection is once per monitoring period. Data will be collected from the field surveys, entered in the database and included in the monitoring report. To monitor the efficiency of the stove at least every two years a new test will be conducted to determine the rate at which a sample of stoves from a given vintage year deteriorate in efficiency. The method to collect the efficiency data will be the Water Boiling Test.

The table below summarizes field measurement data requirements

| *Parameter* | *Timing (indicative)* | *Frequency* | *Methods to be applied* | *Comments on seasonal fluctuation* |
|---|---|---|---|---|
| $T_{y,i}$ | Monitoring will likely occur every 12 months | No less frequently than every two years | Visits to the premises, visual inspection and interview with ICS end-user. | Unlikely to be due to any seasonal fluctuation. |
| $M_{y,i}$ | Monitoring will likely occur every 12 months | No less frequently than every two years | Visits to the premises, visual inspection, and interview with ICS end-user. | Unlikely to be due to any seasonal fluctuation. |
| $\eta_{new,i,a}$ | Monitoring will likely occur every 12 months, and will include ICS from all vintages for which emissions reductions are to be claimed in that monitoring period. | Annually | Water Boiling Test (WBT) Protocol Version 4.0 (or more recent at the discretion of the CME). | Not due to any seasonal fluctuation. |
| $B_{y=1,new,i,survey}$ | Monitoring will likely occur every 12 months | No less frequently than every two years | Visits to the premises, visual inspection, and interview with ICS end-user. | Unlikely to be due to any seasonal fluctuation. |
| $B_{a,i,KPT}$ | Monitoring will likely occur every 12 months | No less frequently than every two years | Visits to the premises, visual inspection, and interview with ICS end-user. | Unlikely to be due to any seasonal fluctuation. |
| $IM_y$ | Monitoring will likely occur every 12 months | No less frequently than every two years | Interview with school staff | Unlikely to be due to any seasonal fluctuation. |
| ***HO*** | Monitoring will likely occur every | No less frequently than every two | Interview with ICS end-user | Not affected by |

| *Parameter* | *Timing (indicative)* | *Frequency* | *Methods to be applied* | *Comments on seasonal fluctuation* |
|---|---|---|---|---|
| | 12 months | years | | seasonal fluctuations |

*(ii) Quality Assurance/Quality Control:*

The CME will apply measures to ensure the required confidence/precision for each sampled parameter is met, allowing for non-response and the possible removal of outliers from the sample, as part of a Quality Control/Quality Assurance system. The choice of measure applied to each parameter will depend on the cost of each data collection approach and logistics required. For the case of parameters collected through surveys, sample size calculations will consider non-response rates (oversampling). If the reliability measures are not attained, the CME will draw additional random samples or decide to apply the most conservative bound of the confidence interval.

In the case of parameter $\eta_{new,i,a}$, the sample size calculations do not account for non-response rates (oversampling) because these Water Boiling Tests are generally more complex and time consuming than surveys and oversampling could result in considerable amounts of time and resources wasted. Thus, to account for non-response rates, the CME will draw additional samples as needed to reach reliability levels or use the lower bound (most conservative) of the confidence interval for thermal efficiency.

The sampling plan has the following procedures in place to ensure good quality data. The CME or CPA Implementer will ensure that field personnel have reviewed, understand and have agreed to follow the monitoring plan procedures, including provisions for maximizing response rates, documenting out-of-population cases, refusals and other sources of non-response. A quality control and assurance strategy will be documented. Quality control and assurance strategies include addressing non-sampling errors, such as non-response or bias from interviewer. The CME or a competent third party designated by the CME with the proper skills will train the monitoring personnel on how to properly survey units to prevent bias from interviewer. In the case a household refuses to participate, another household will be chosen at random. To reduce interviewer bias, good questionnaire design and well-tested questionnaires will be used.

The calculation of the sample size will be carried out using estimates for parameter proportions, mean values, variances, and standard deviations, as the actual characteristics of the population/sampling frame are unknown. In order to ensure the quality of the sampling results, the CME can draw on the provisions for reliability calculations including estimating the bounds of the confidence interval, the standard error of the mean value or proportion, and the t-value as derived from the t-distribution.[92] In the event that the sampling results do not fulfil the required level of confidence and precision, the CME can undertake additional samples. If the reliability is still not sufficient after raw data and summary statistics are scrutinized and after additional samples have been collected,[93] the sampling may be repeated with an increased sample size.

[92] As provided by the *Guidelines for Sampling and Surveys in CDM Project Activities and Programme of Activities* (EB 75 Annex 8 "Best practice examples for reliability calculations")

[93] Ibid

Alternatively, the CME may choose to apply the lower bound (or higher bound according to the more conservative approach) of the sampling results as is allowed for by the methodology (AMS-II.G version 6, paragraph 39).

As the continued use of ICS is a binary parameter, there can be no outliers in the sampled data and no treatment for outliers is required. The sample data for $\eta_{new,i,a}$, $M_{y,i}$, $B_{a,i,,KPT,}$and $B_{y=1,new,i,survey}$ is continuous and therefore the presence of outliers is possible. Outliers will be defined as those data points with values greater than three standard deviations from the mean of the sample for each vintage.

Data points identified as outliers according to the above analysis will be examined further to correct for possible transcription and data entry errors, but will be omitted from the analysis if no such administrative errors exist.

*(i) Data archiving*

Hard copies of the surveys will be kept and the database will have back up. Original stove purchase contracts, information collected from the Registration Card) or other means of acceptance by the users will be stored in the main office for the coordinating entity. A back-up of the project database will also be stored on an electric medium by the CME. All data monitored and required for verification and issuance will be kept for two years after the end of the crediting period or the last issuance of CERs for the project activity, whichever is later.

*(ii) Analysis*

The CME will manage a project database that includes the following data that can be directly attributable to each CPA within the PoA, thereby allowing unambiguous determination of the emission reductions attributable to each CPA:

- A list of units participating in each CPA, including name, community/location, distribution/installation date and unique serial number;
- Testing to ensure that the stoves are still operating above the minimum 20% efficiency required by the AMS II.G (version 6) methodology, by the CPA Implementer, CME or a third party certified by a national standards body or an appropriate certifying agency recognized by it.
- Where replacements are made, assurance that the efficiency of the new ICS is similar to the specified.

Data obtained from the samples will be used to estimate proportions and mean values for the parameters described above. The values will then be factored into the emissions reduction calculations and result in the request for issuance of CERs for that group of CPAs.[94] The parameters are applied for emission reduction calculations as outlined in the CPA-DD. The stoves that are not in use will be excluded from emissions reductions calculations and will not be counted towards the total number of ICS in operation during the monitoring period. The thermal efficiency of improved cook stoves ($\eta_{new,i,a}$) will be used in the calculation of the per stove emission reduction, which will be multiplied by the number of stoves in operation in the CPA to obtain the emission reductions per CPA.

(c) Implementation:

[94] For avoidance of doubt, each CPA will produce a monitoring report using the appropriate monitoring parameters.

Sampling for the purpose of emission reduction calculation and elaboration of the monitoring report will occur at the end of each monitoring period. This sampling will be conducted by trained personal either part of the CPA Implementer or CME team, or an experienced third party entity. The credentials and/or training materials for the sampling personal will be provided to the DOE at verification. The maximum length of one monitoring period will be two years (duration, not calendar years), as AMS II.G., version 6, provides the option for annual or biennial monitoring. The CPA Implementer, or an entity designated by the CPA Implementer, will be responsible for managing household data collection and entry into the project database. Field personnel will receive training on how to properly deal with surveying techniques to reduce errors. The project database will record the start and end dates of each monitoring period, and record the emission reductions attributable to each monitoring period. Appropriate record keeping procedures will be implemented to ensure that each monitoring period data set can be transparently attributed to its corresponding CPA, preventing any occurrences of double counting. An internal review of the project database will be able to determine the current status of each SSC-CPA—the duration of previous monitoring periods, the units delivering monitoring data, and current verification activities.

*(i) Assessment for Leakage*

According to methodology AMS II.G, version 6, leakage related to the non-renewable woody biomass saved by the project activity shall be assessed on *ex-post* surveys of users and the areas from which the woody biomass is sourced. The methodology offers the alternative that if $B_{old,i}$ is multiplied a net to gross adjustment factor of 0.95 to account for leakages, surveys are not required. This PoA will use the 0.95 leakage adjustment factor instead of *ex-post* surveys.

The other source of leakage occurs if equipment currently being utilised is transferred from outside the boundary to the project activity. All ICS in the PoA will be newly manufactured/assembled or newly installed. Where second-hand/used ICS are distributed to an end-user the ICS will be from within the project (i.e. previously newly manufactured/assembled and either a demonstration model or transferred from one end-user within the project to another new or existing end-user). In both of these cases there will no equipment (ICS) being utilized outside the project area (any project non-participant) that is transferred to the project area (included as an ICS in the database) so leakage defined in paragraph 21 of the AMS II.G (version 6) methodology is not considered. Where second-hand/used ICS are transferred within the project area (between end-user project participants) the database will be updated to reflect this change to ensure there is no double counting of ICS.

*(ii) Disposal of Low Efficiency Appliances and Use of Baseline Stoves*

As per methodological condition in paragraph 22, if it is determined that the conventional open fire is still in use and the ICS is also in use, the wood used in conventional open fire will be subtracted from $B_{old,i}$. The number of units continuing to use a baseline stove in addition to their ICS, will be monitored throughout the project lifetime. This will be achieved using a single sample for in-use appliances ($T_{y,i}$) described above, and will meet EB 74 Annex 6 confidence/precision requirements. The fraction of the baseline that can be attributed to the ICS will be accounted though parameter $M_{y,i}$ described above.

*(iii) Monitoring Reporting*

The CME will assess all monitoring data and produce a monitoring report for each CPA

for the DOE to verify corresponding to the preceding monitoring period of all CPAs. This report will present the data relating to the emission reductions generated by those CPAs during the monitoring period.

# Appendix 1. Contact information of coordinating/managing entity and responsible person(s)/ entity(ies)

| | |
|---|---|
| **CME and/or responsible person/ entity** | ☒ CME<br>☒ Responsible person/ entity for application of the selected methodology(ies) and, where applicable, the selected standardized baseline(s) to the PoA |
| **Organization** | C-Quest Capital Malaysia Global Stoves Limited |
| **Street/P.O. Box** | Brighton Place, Lot U0215, Jalan Bahasa<br>P.O. Box 80148 |
| **Building** | c/o Equity Trust Business Centre |
| **City** | Labuan |
| **State/Region** | FT |
| **Postcode** | 87011 |
| **Country** | Malaysia |
| **Telephone** | +6 087 423828 |
| **Fax** | +6 087 417242 |
| **E-mail** | cqc-operations@cquestcapital.com |
| **Website** | www.cquestcapital.com |
| **Contact person** | Isabel Alegre |
| **Title** | Managing Director |
| **Salutation** | Ms. |
| **Last name** | Alegre |
| **Middle name** | |

# Appendix 2. Affirmation regarding public funding

A letter has been provided to the validator outlining that any public funding will not result in a diversion of Official Development Assistance (ODA).

USAID | HAITI
FROM THE AMERICAN PEOPLE

June 25, 2014

Mr. Michelet Fontaine
Chief of Party
Improved Cooking Technology Program
Chemonics International
Rue Solon Menos,
Peguy Ville, Haiti.

SUBJECT: Non-Diversion of Official Development Assistance Funds for Improved Cookstoves in Haiti Clean Development Mechanism Program of Activities.

Dear Mr. Fontaine,

The United States Agency for International Development (USAID) has noted from the "Modalities and procedures for a clean development mechanism (CDM) as defined in Article 12 of the [2001] Kyoto Protocol" that the countries included in Annex I as parties to the Convention (Parties), such as the United States of America, should help non-Annex I countries achieve sustainable development and contribution to the overall objectives of the Convention. Furthermore, USAID acknowledges CDM decision 17/CP.7 which states that funding from Parties in Annex I for CDM projects "is not to result in the diversion of official development assistance and is to be separate from and not accounted towards the financial obligations of Parties included in Annex 1."

This letter is to indicate that USAID is supporting the development of the "Improved Cookstoves for Haiti" Program of Activities (PoA), which seeks registration under the Clean Development Mechanism. The PoA is being developed as part one of several activities funded by USAID through a contract with Chemonics for an Improved Cooking Technology Program in Haiti. The funding supporting the PoA development is being provided from existing USAID program budgets and is in no way a diversion of foreign assistance funds towards any explicit or implicit climate change goals of the U.S. Government.

U.S. Agency for International Development
U.S. Embassy
Tabarre 41, Boulevard 15 Octobre
HT-6123, Haïti
P.O. Box 1634, Port-au-Prince, HAITI

Tel: (509) 2 229 8000
Fax : (509) 2 229-8066
www.usaid.gov/ht

In addition, the U.S. Government will not claim any portion of the emissions reductions generated by the "Improved Cookstoves for Haiti" PoA; nor will it claim any revenue resulting from the implantation of this PoA or Component Project Activities under this PoA.

We hope this clarifies any questions related to the CDM guidelines on overseas development assistance.

Sincerely yours,

Mark A White
Acting Mission Director

Attachment: Decision 17/CP.7, Modalities and procedures for a clean development mechanism as defined in Article 12 of the Kyoto Protocol (in pertinent part).

U.S. Agency for International Development
U.S. Embassy
Tabarre 41, Boulevard 15 Octobre
HT-6123, Haïti
P.O. Box 1634, Port-au-Prince, HAITI

Tel: (509) 2 229 8000
Fax : (509) 2 229-8066
www.usaid.gov/ht

# Appendix 3. Applicability of methodology(ies) and standardized baseline(s)

See section B.3 of the PoA Design Document (Part I of this document) and to section B.2 of the Generic Component Project Activity (Part II of this document).

# Appendix 4. Further background information on ex ante calculation of emission reductions

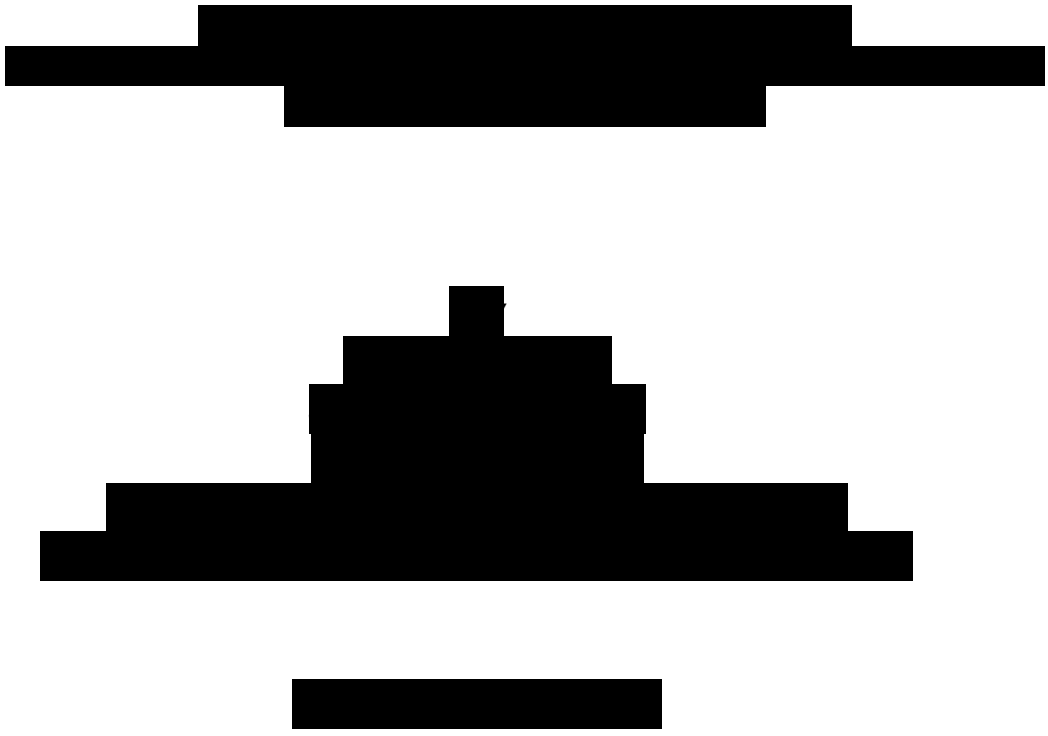
Baseline reports commissioned to Jonathan Rouse, Javier Lascurain, and Kirstie Jagoe (independent consultants) are attached to this document. The reports outline fuel consumption baseline estimates and procedures to obtain those estimates in accordance with the Standard for Sampling in CDM Project Activities and Programme of Activities" (EB 74 Annex 6) and the "Guidelines for Sampling in CDM Project Activities and Programme of Activities" (EB 69 Annex 5). Three baseline studies are submitted with this document: charcoal consumption in Port-au-Prince households and charcoal consumption in cities with populations above 10,000 (excluding Port-au-Prince), street-vendor charcoal consumption in Port-au-Prince and charcoal consumption in Port-au-Prince schools.

# Appendix 5. Further background information on the monitoring plan

See section B.7.2 of the Generic Component Project Activity (Part II of this document) for details on the monitoring plan

# Appendix 6. Summary of post registration changes

**Baseline reports attached to PoA-DD**



## *Contents*

### *Exchange rate (approximate at time of report)*

[redacted]

### *Document development record*

| [redacted] | [redacted] | [redacted] |
|---|---|---|
| [redacted] | [redacted] | [redacted] |
| [redacted] | [redacted] | [redacted] |
| [redacted] | [redacted] | [redacted] |

# 1 Executive summary

[redacted]

### *(i) Methodology*

[redacted]

### *(ii) Key results*

[redacted]

[95] This was the most recent version at the moment of planning and implementing the study. The newer version of the Guidelines does not affect the validity of the sampling methods.

# 2 Methods

## 2.1 Roles

## 2.2 Sampling strategy

### *(i) Sampling from within cities/communal sections*

## 2.3 Sample size determination

[redacted]

## 2.4 Questionnaire development

[redacted]

## 2.5 Measurement of charcoal

[redacted]

## 2.6 Quality control

[redacted]

[96] Jonathan Rouse is director and principal consultant at HED Consulting; Kirstie Jagoe also works as consultant for HED Consulting.

[redacted]

# 3 Analysis

## 3.1 Data checking

[redacted]

## 3.2 Average charcoal consumption per day

[redacted]

[97] As per Papyrus Consulting.

[98] Each charcoal consumption data point was applied converted to a natural logarithm scale.

## 3.3 Accounting for seasonal changes in amount of charcoal fuel used

## 3.4 Summary of findings

## 3.5 Assessing the difference between regional means

[99] Some HH had data missing for seasonal patterns.

[100] Excludes households that reported zero charcoal consumption or that did not have data for this parameter

[101] Standard deviation of log-transformed data

102 Standard error of log-transformed data

[redacted]

# 4 Other factors investigated

[redacted]

## 4.1 Influence of field partners

[redacted]

## 4.2 Influence of other fuels

[redacted]

## 4.3 Impact of other uses of charcoal

[redacted]

## 4.4 Impact of using all of a household's charcoal for weighing

[redacted]

# 5 Comparison with other studies

[redacted]

# 6 References

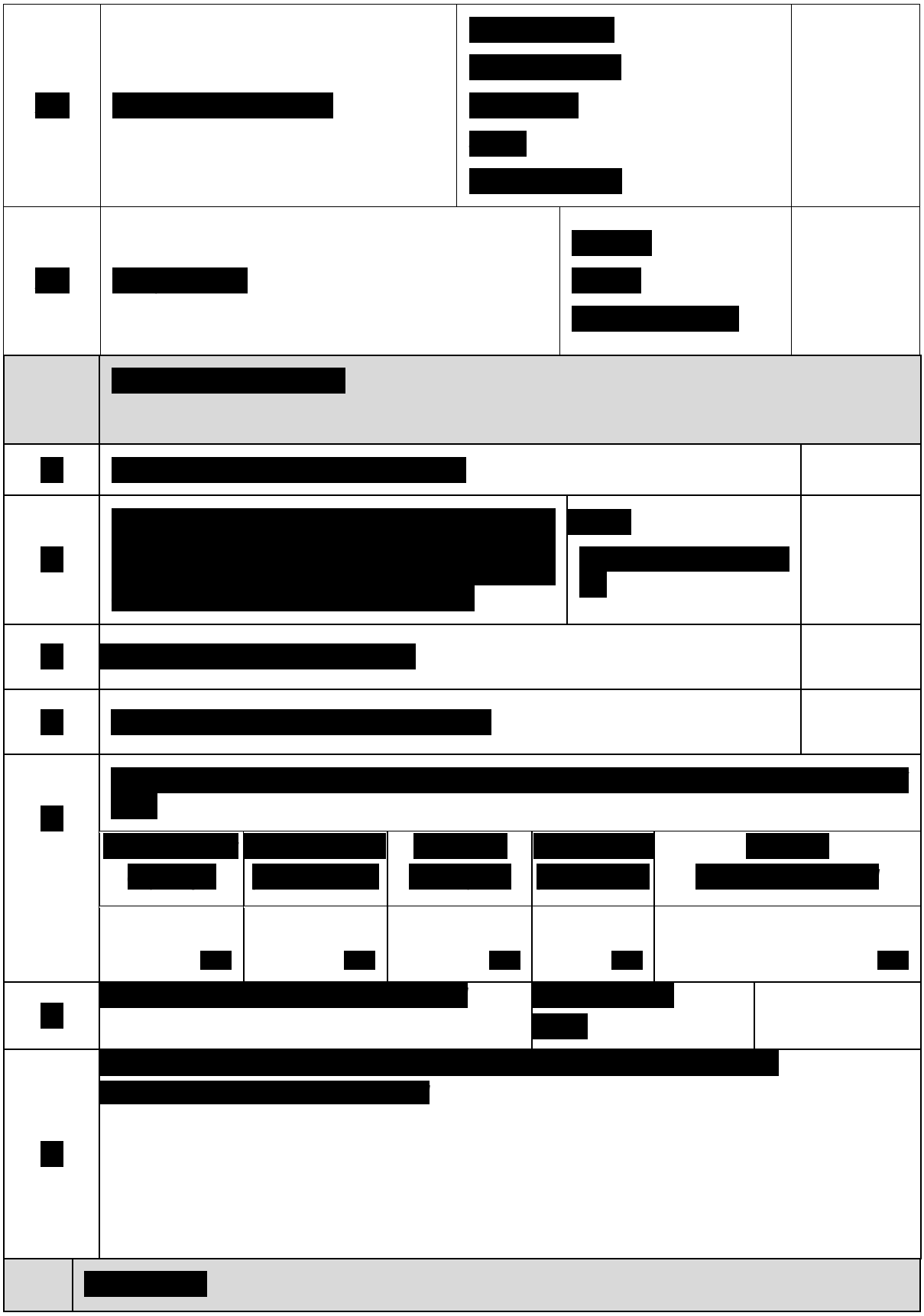
[redacted]

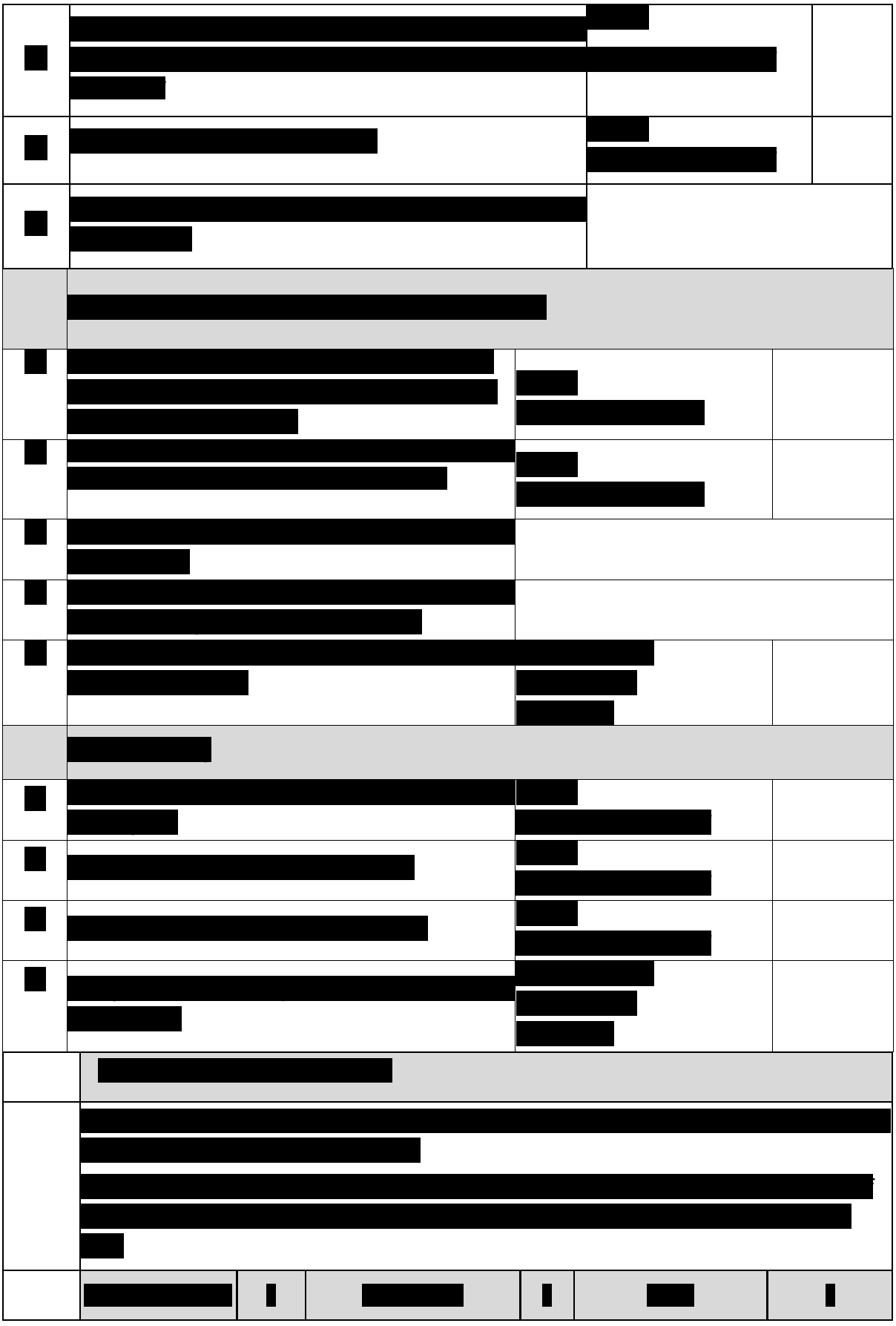
[103] The ESMAP study indicates that their estimates are “nonstatistically significant”. Nextant mentions that 38 surveys were conducted in urban areas, which is probably unlikely to lead to statistically robust results.

# Annex 1. Baseline Charcoal Consumption Questionnaire: English

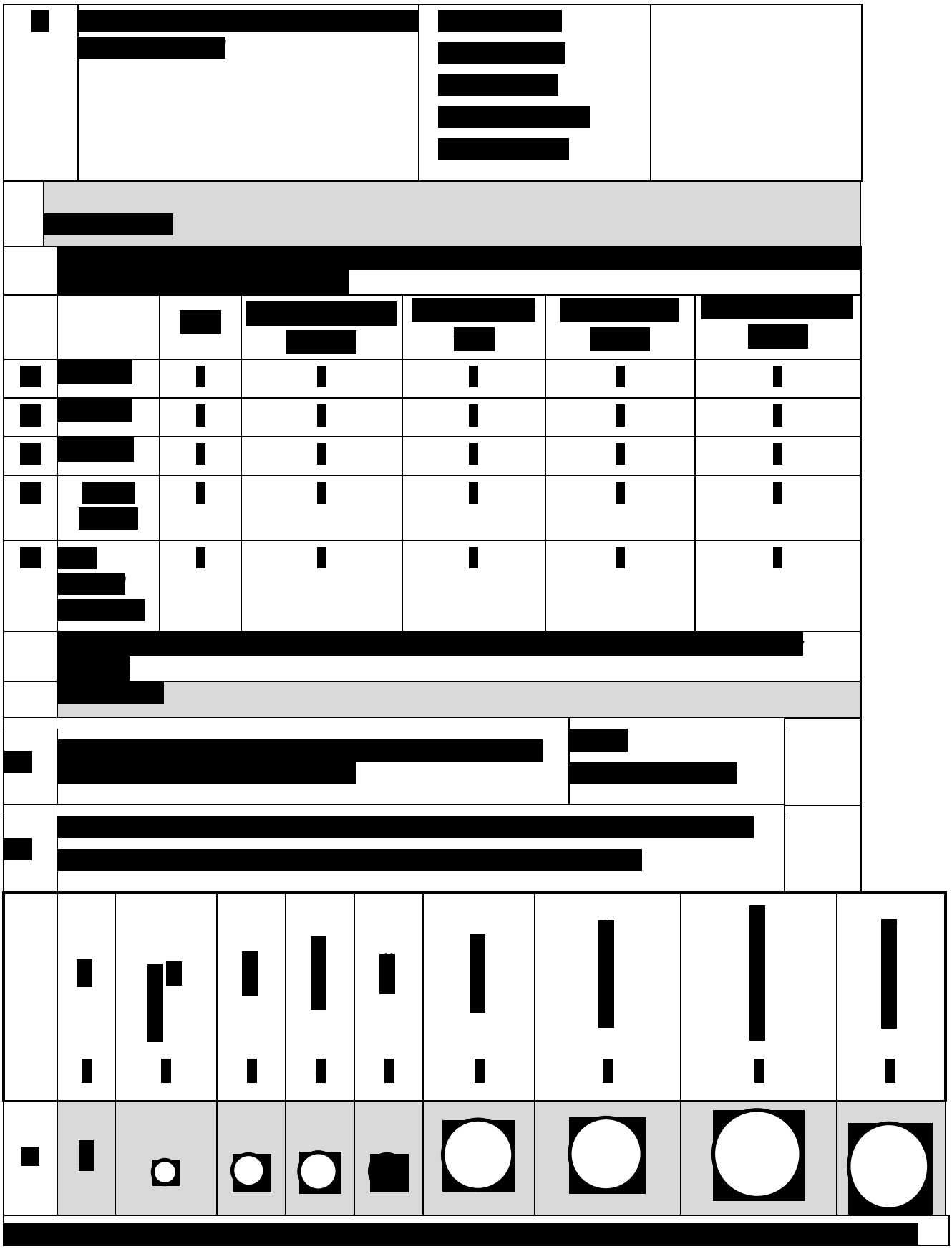
[redacted]

| | | | |
|---|---|---|---|
| [redacted] | [redacted] | [redacted] | |
| [redacted] | [redacted] | [redacted] | |
| [redacted] | [redacted] | [redacted] | |
| [redacted] | [redacted] | [redacted] | |
| [redacted] | [redacted] | | |
| [redacted] | [redacted] | | |
| [redacted] | [redacted] | | |
| [redacted] | [redacted] | | |
| [redacted] | [redacted] | | |
| [redacted] | [redacted] | | |
| [redacted] | [redacted] | | |
| [redacted] | [redacted] | | |
| [redacted] | [redacted] | | |





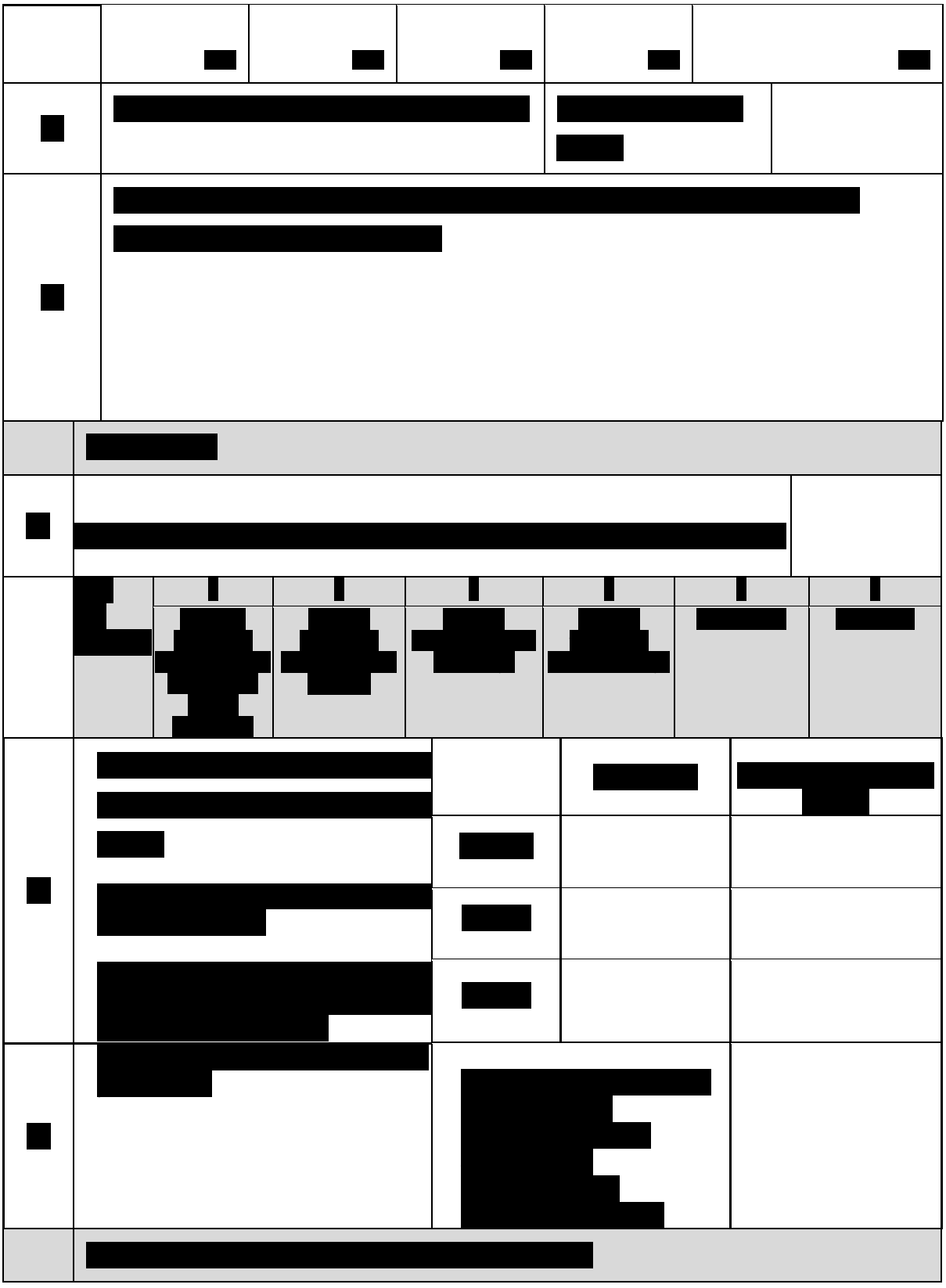

__ __ __ __ oz
__ __ __ lbs
__ __ __ . __ __ oz

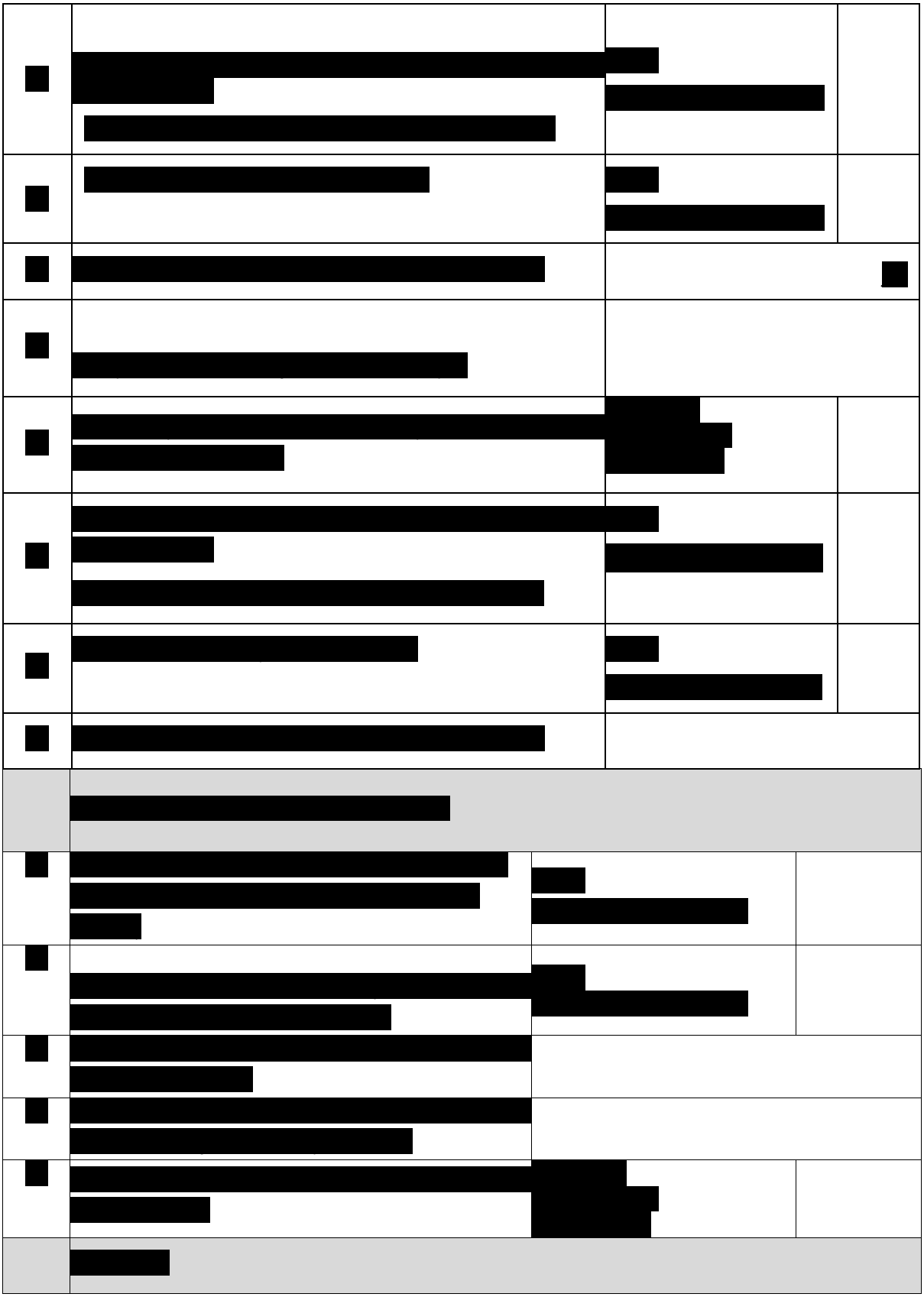


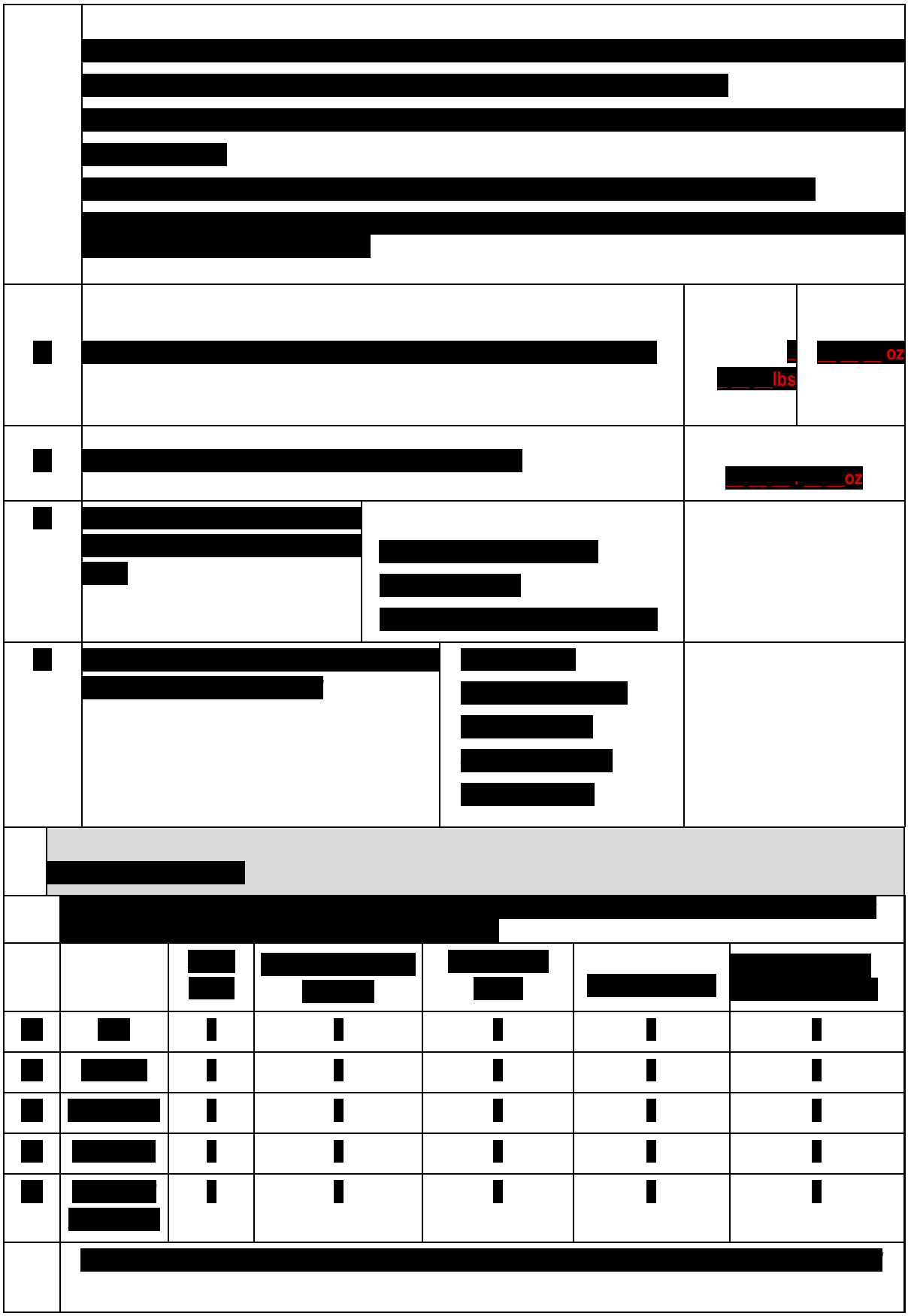
| | |
|---|---|
| [redacted] | [redacted] |
| | [redacted] |
| [redacted] | [redacted] |

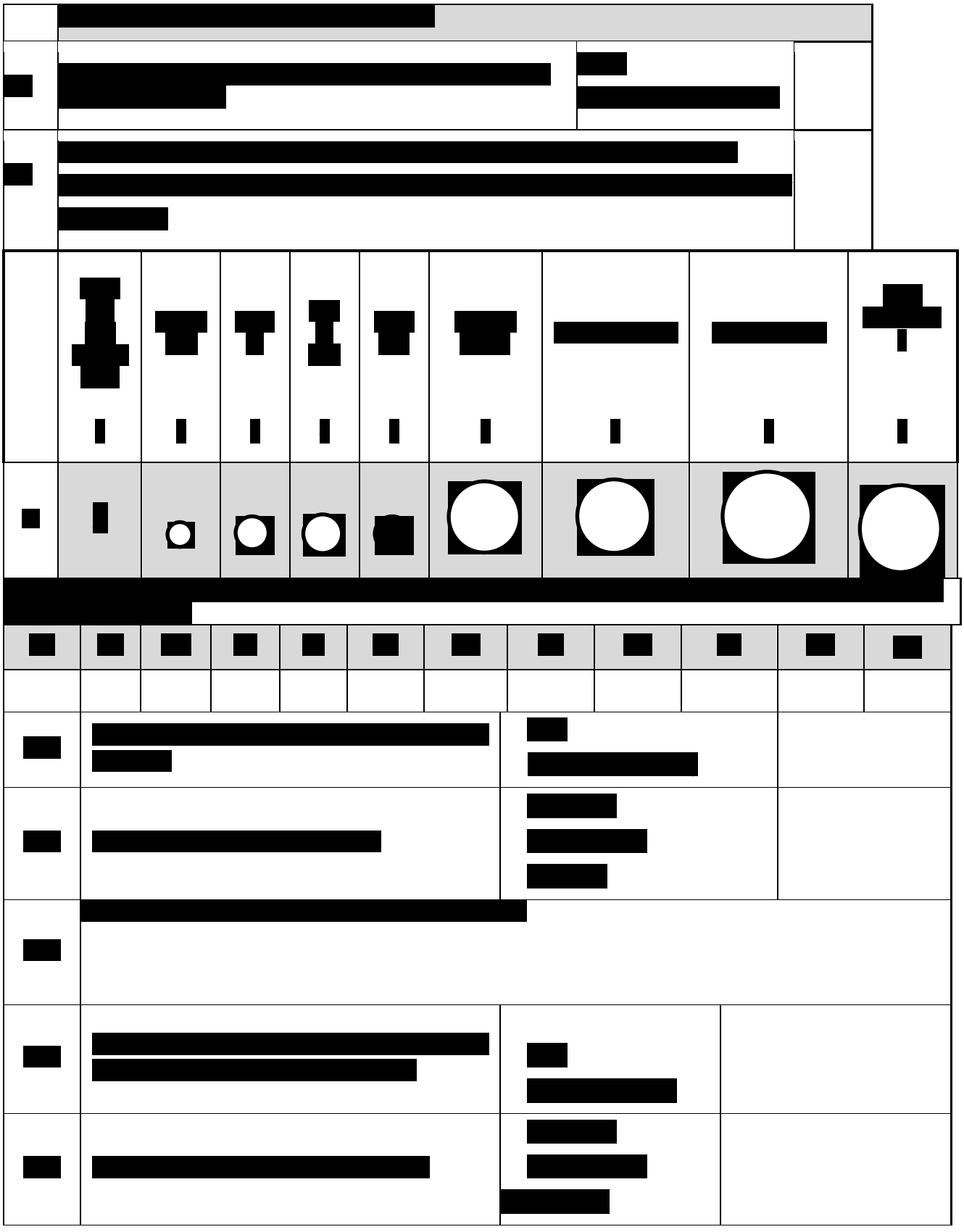
[redacted]

| [redacted] | | | |
|---|---|---|---|
| [redacted] | [redacted] | [redacted] | |
| [redacted] | [redacted] | [redacted] | |
| [redacted] | [redacted] | [redacted] | |
| [redacted] | [redacted] | [redacted] | |
| [redacted] | [redacted] | | |

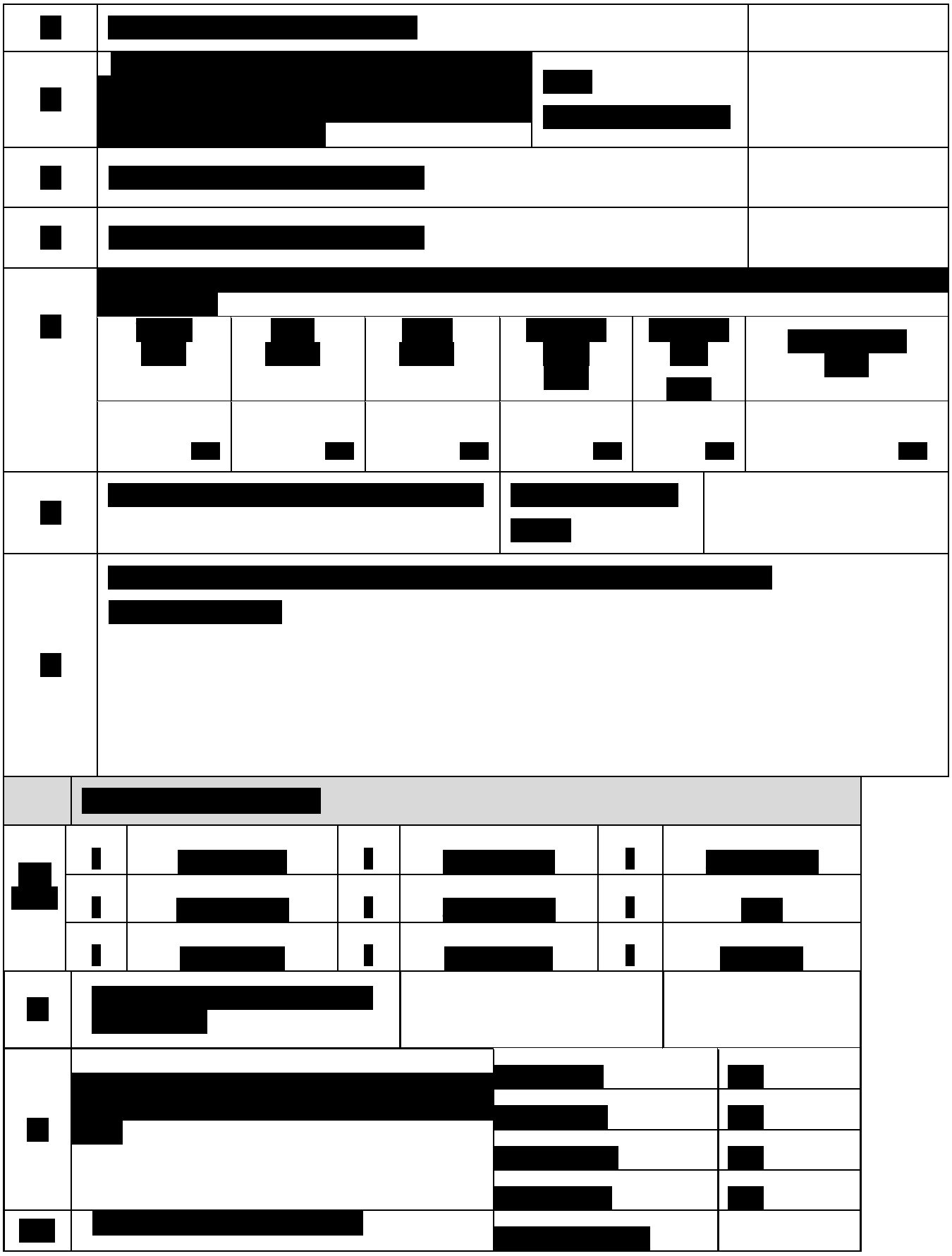


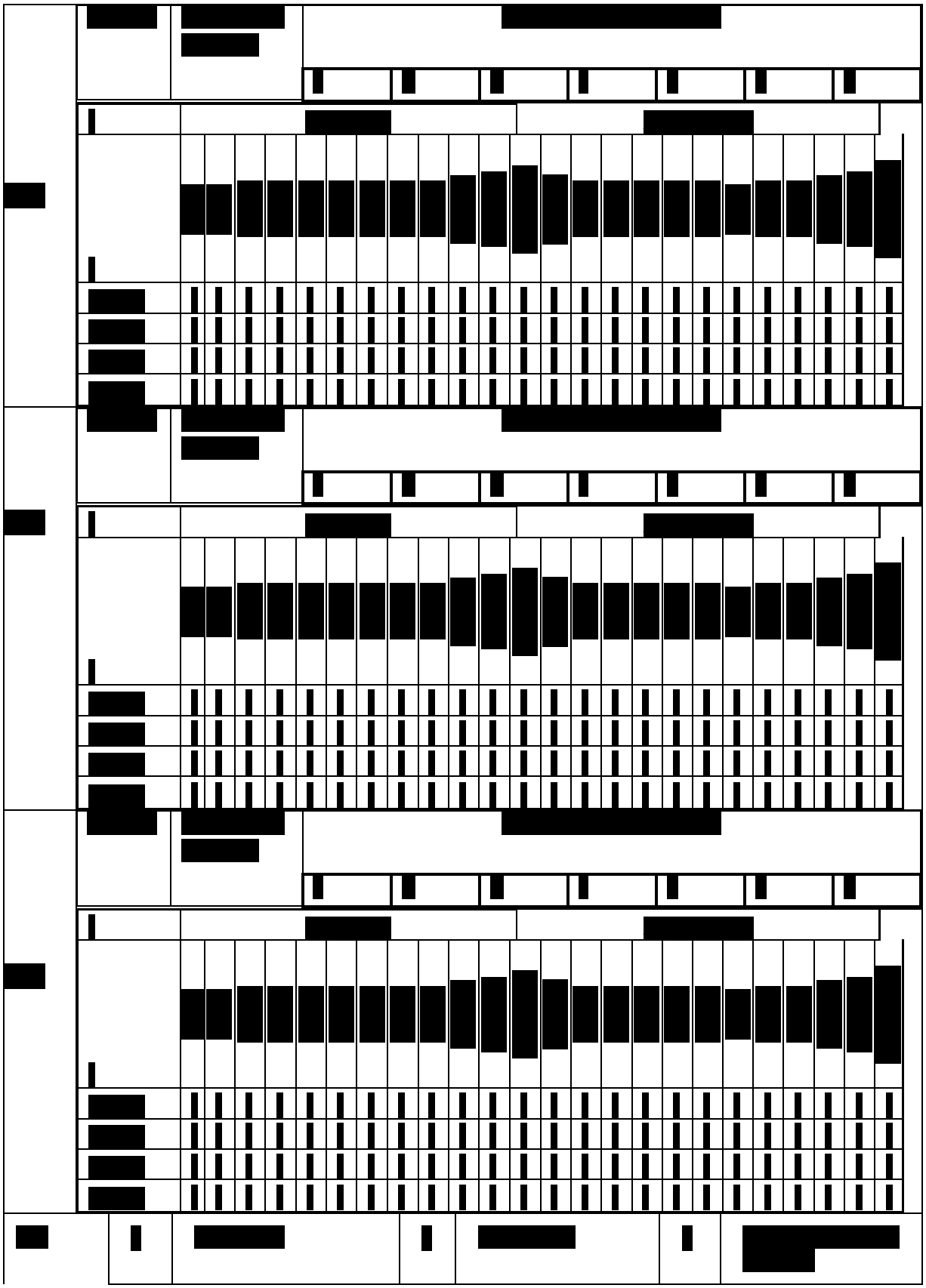


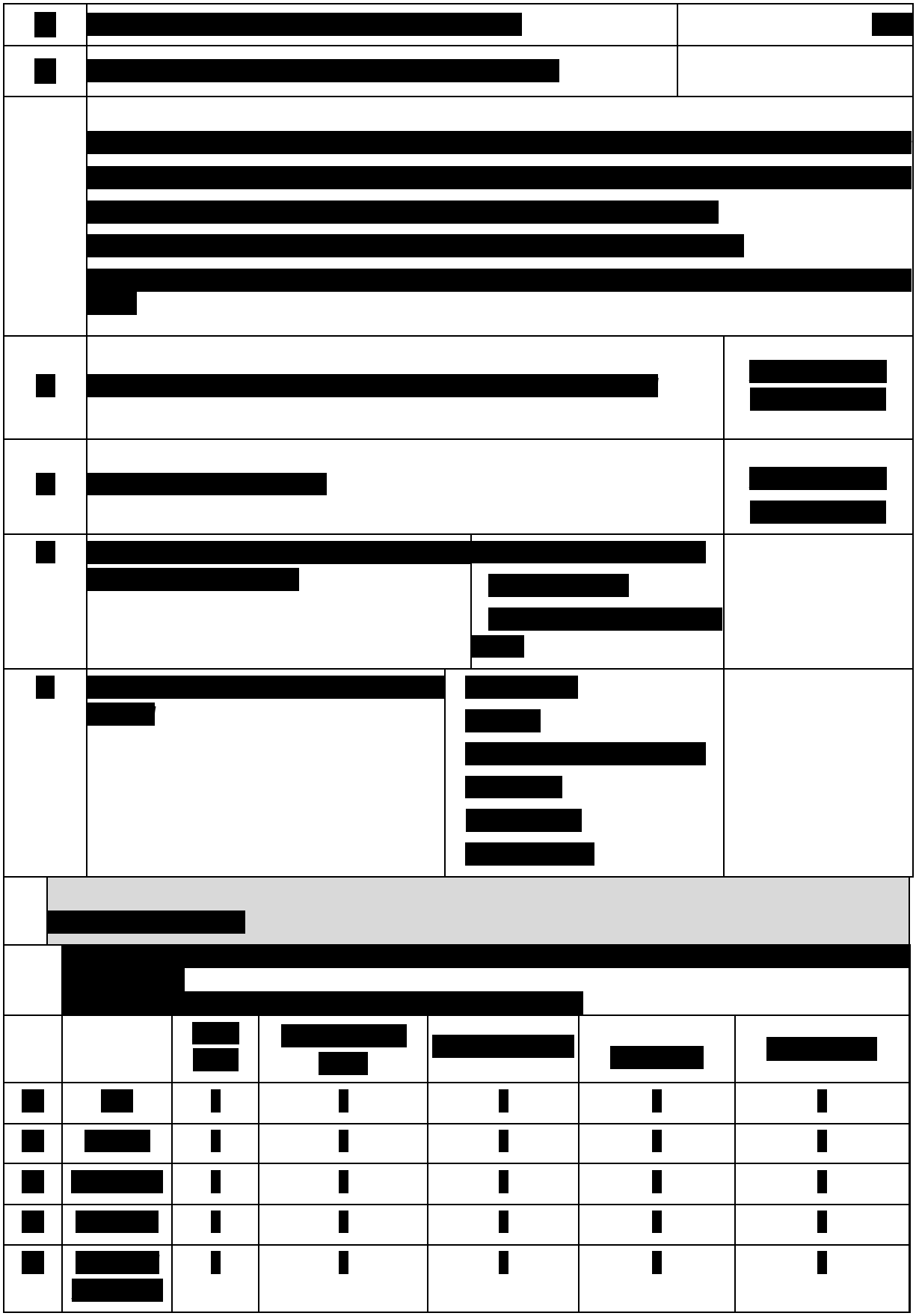


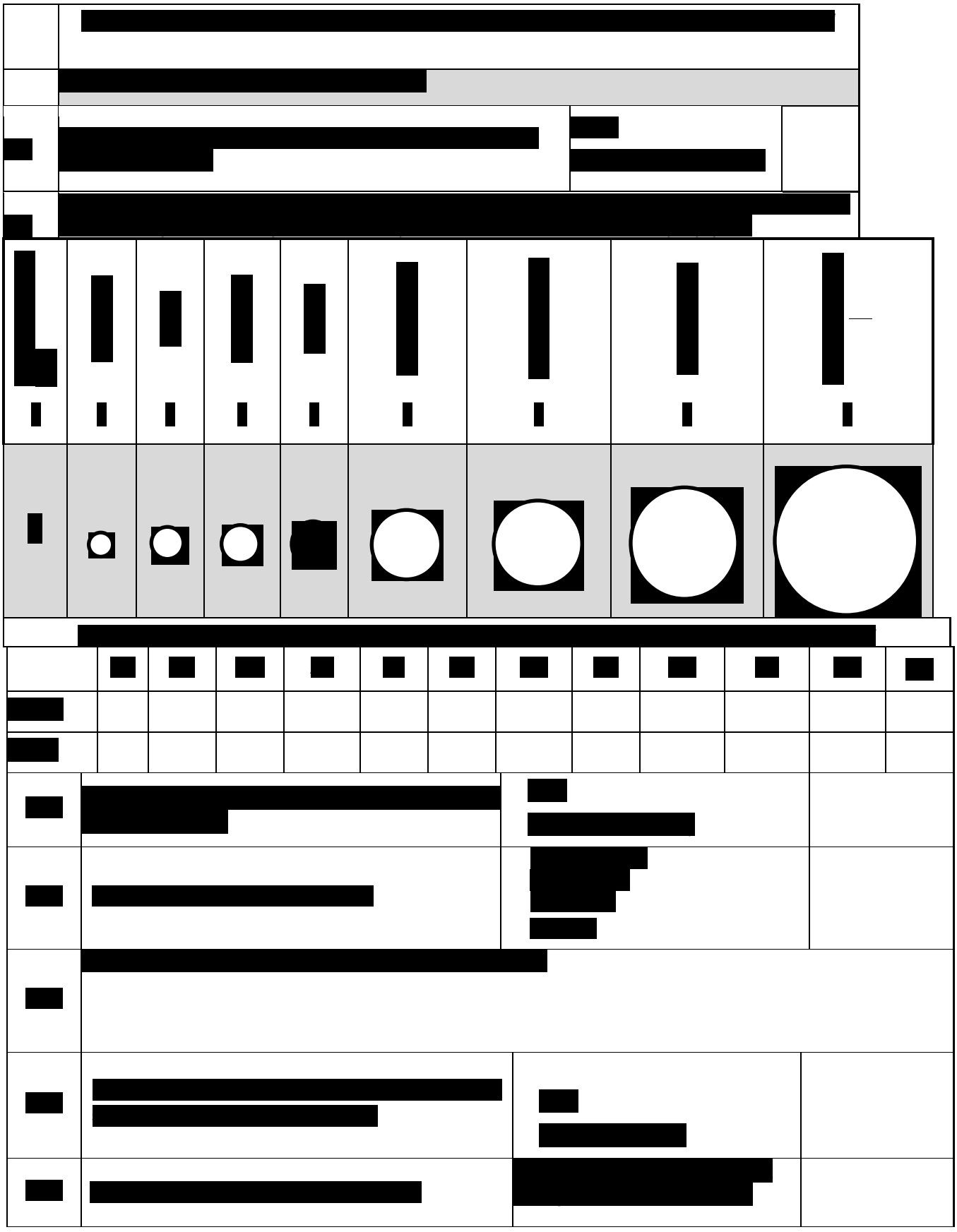


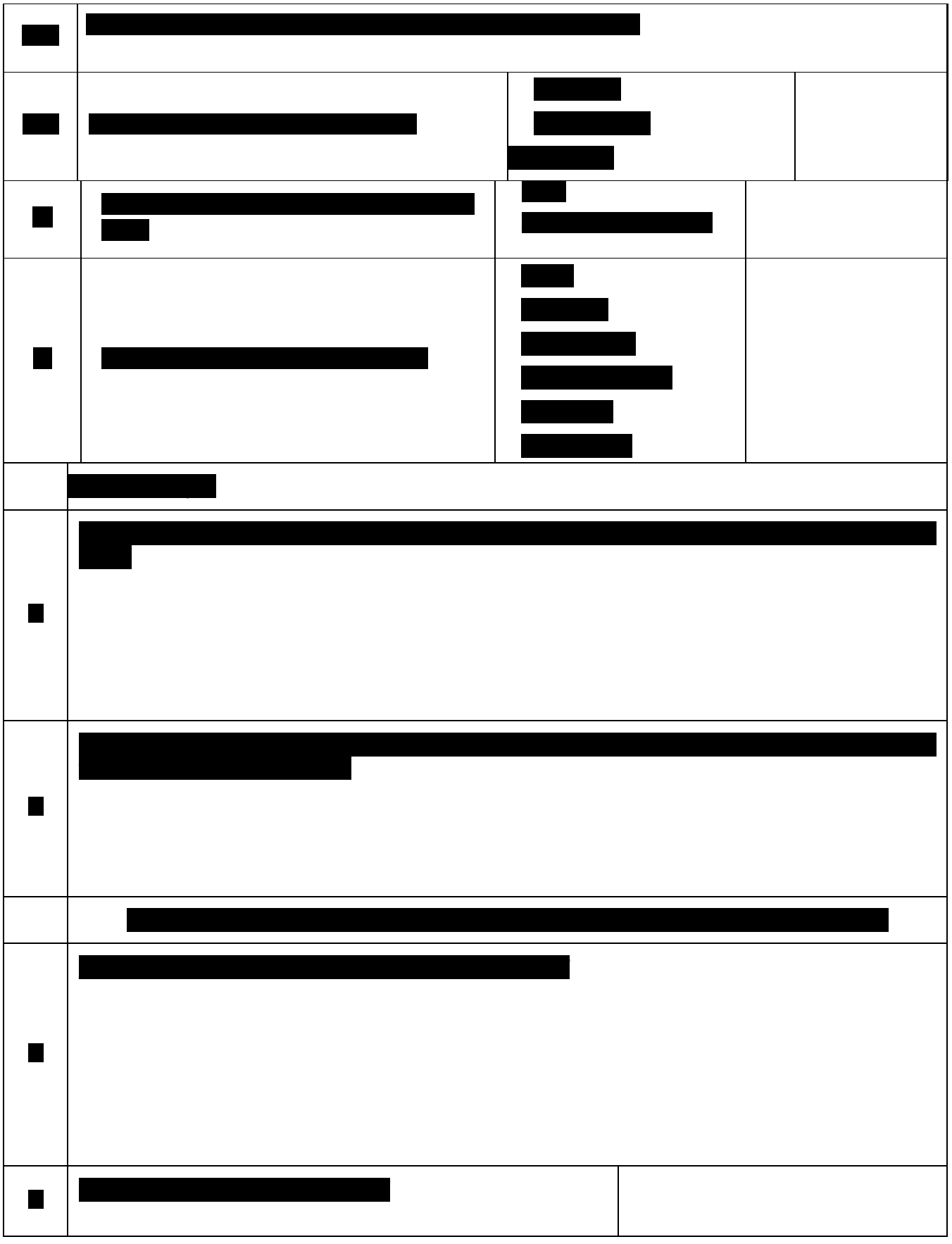
[redacted]



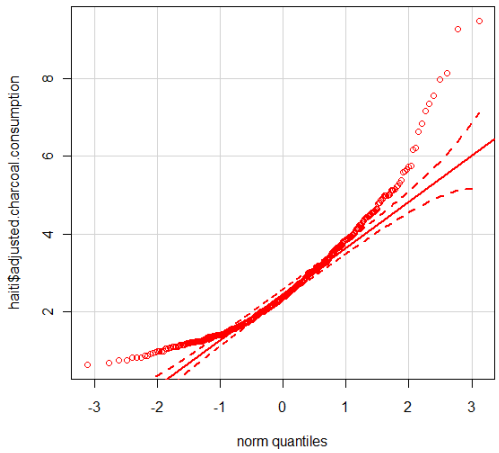




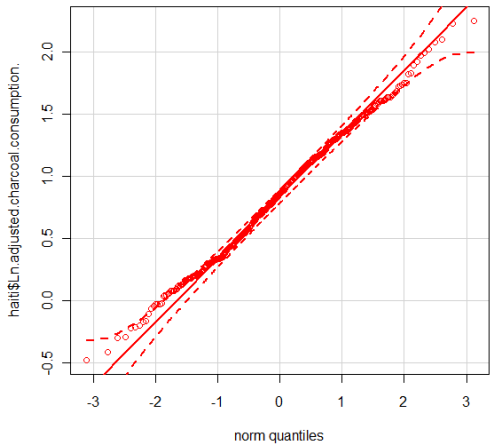




[redacted]



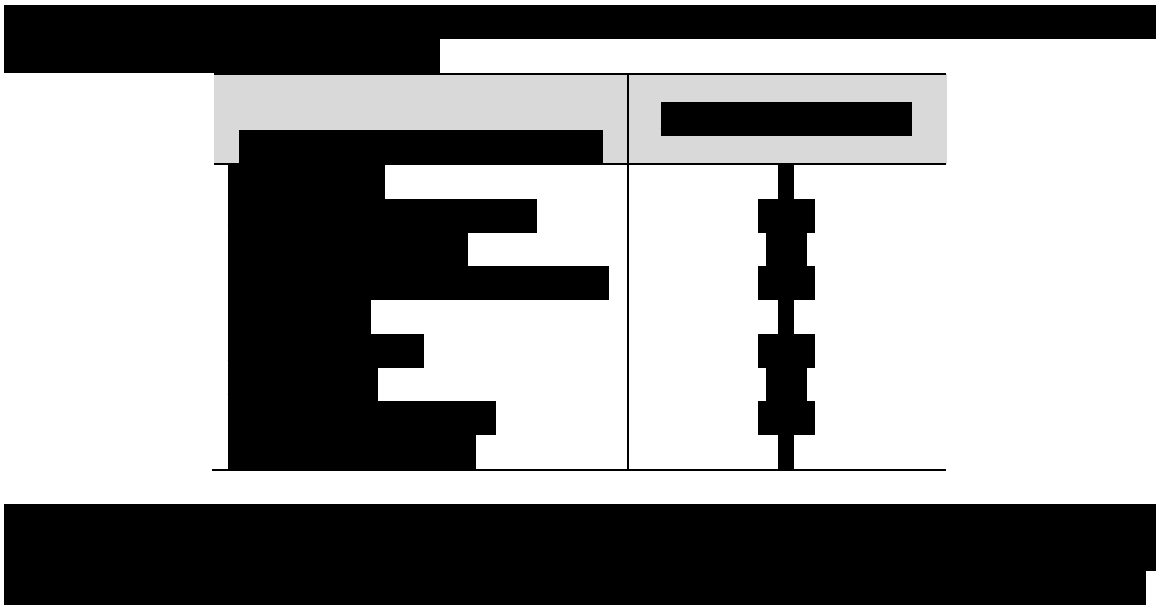

[redacted]




[redacted]

## Annex 3. Calculation of adjustment for seasonal fuel use

[redacted]



## Annex 4. List of cities above 10,000 inhabitants included in the study

[redacted]

## Annex 5. List of Port-au-Prince urban agglomeration included in the study

[redacted]

## *Contents*

## *Acronyms*

## *Exchange rate (approximate at time of report)*

## *Interpreting the statistical tables in this report*

## *Document development record*

| | | |
|---|---|---|
| | | |
| | | |
| | | |
| | | |
| | | |

# 1 Executive summary

[redacted]

*Methodology*

[redacted]

# 2 Methods

## 2.1 Roles

## 2.2 Questionnaire development

## 2.3 Sample size determination

## 2.4 Sampling strategy

[redacted]


[redacted]

**Table 1.1: Communes included in the sample**

| [redacted] | [redacted] | [redacted] |
|---|---|---|
| [redacted] | [redacted] | |
| [redacted] | [redacted] | |
| [redacted] | [redacted] | [redacted] |

[redacted]

[redacted]

## 2.5 Practical issues for data collection

[redacted]

### *2.5.1 Security concerns*

[redacted]

### *2.5.2 Survey tools*

[redacted]

### *2.5.3 Key people not available for interview*

[redacted]

### *2.5.4 Limited availability of food and fuel*

[redacted]

## 2.6 Phase 2 data collection

[redacted]

## 2.7 Quality control

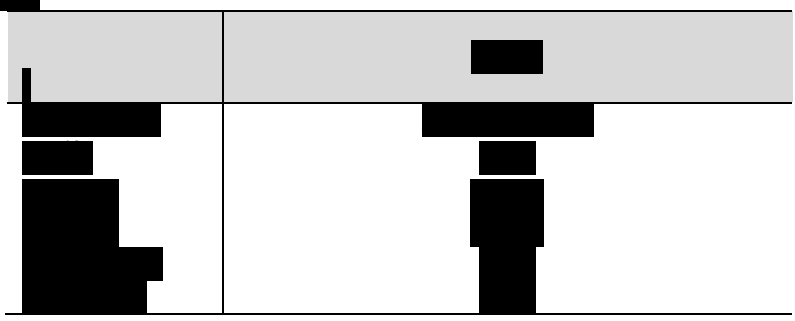
[redacted]

# 3 Analysis

## 3.1 Final sample size

## 3.2 Overview of schools

## 3.3 Raw data from all schools



## 3.4 Adjusting for number of people cooked for per day

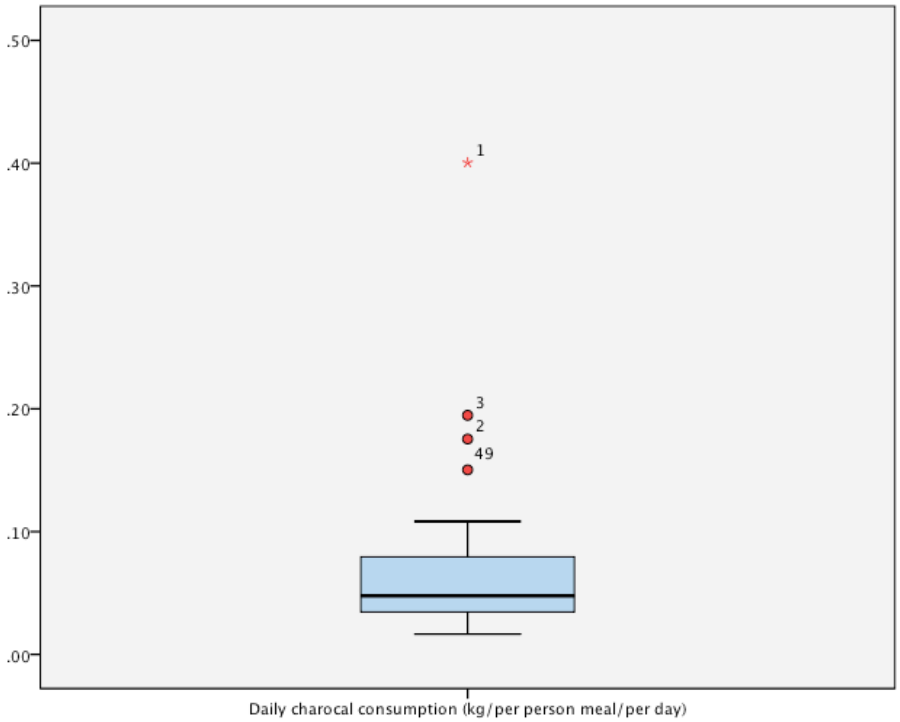
[104] Standard Error (SE) this is the standard deviation of the sample mean and describes its accuracy as an estimate of the population mean. As sample size increases, the estimator is based on more information and becomes more accurate, so its standard error decreases.

[redacted]

| [redacted] | [redacted] |
|---|---|
| [redacted] | [redacted] |
| [redacted] | [redacted] |
| [redacted] | [redacted] |
| [redacted] | [redacted] |
| [redacted] | [redacted] |
| [redacted] | [redacted] |

[redacted]

[redacted]




[redacted]

[redacted]

*Table 3.3: Daily charcoal consumption (kg/per person meal): Outliers removed*

| [redacted] | [redacted] |
|---|---|
| [redacted] | [redacted] |
| [redacted] | [redacted] |
| [redacted] | [redacted] |
| [redacted] | [redacted] |
| [redacted] | [redacted] |
| [redacted] | [redacted] |
| [redacted] | [redacted] |

[redacted]

# 4 Other factors investigated

[redacted]

## 4.1 Supplementing charcoal with other fuels

[redacted]

| [redacted] | [redacted] | [redacted] | [redacted] |
|---|---|---|---|
| [redacted] | [redacted] | [redacted] | [redacted] |
| [redacted] | [redacted] | [redacted] | [redacted] |
| [redacted] | [redacted] | [redacted] | [redacted] |

[redacted]

## 4.2 Exploring changes in amount of charcoal used during the year

[redacted]

### *Variation in number of days using charcoal for cooking*

[redacted]

### *Variation in quantity of charcoal used*

[redacted]

### *Implications of annual variation in charcoal use on monitoring*

[redacted]

[redacted]

# 5 Annexes

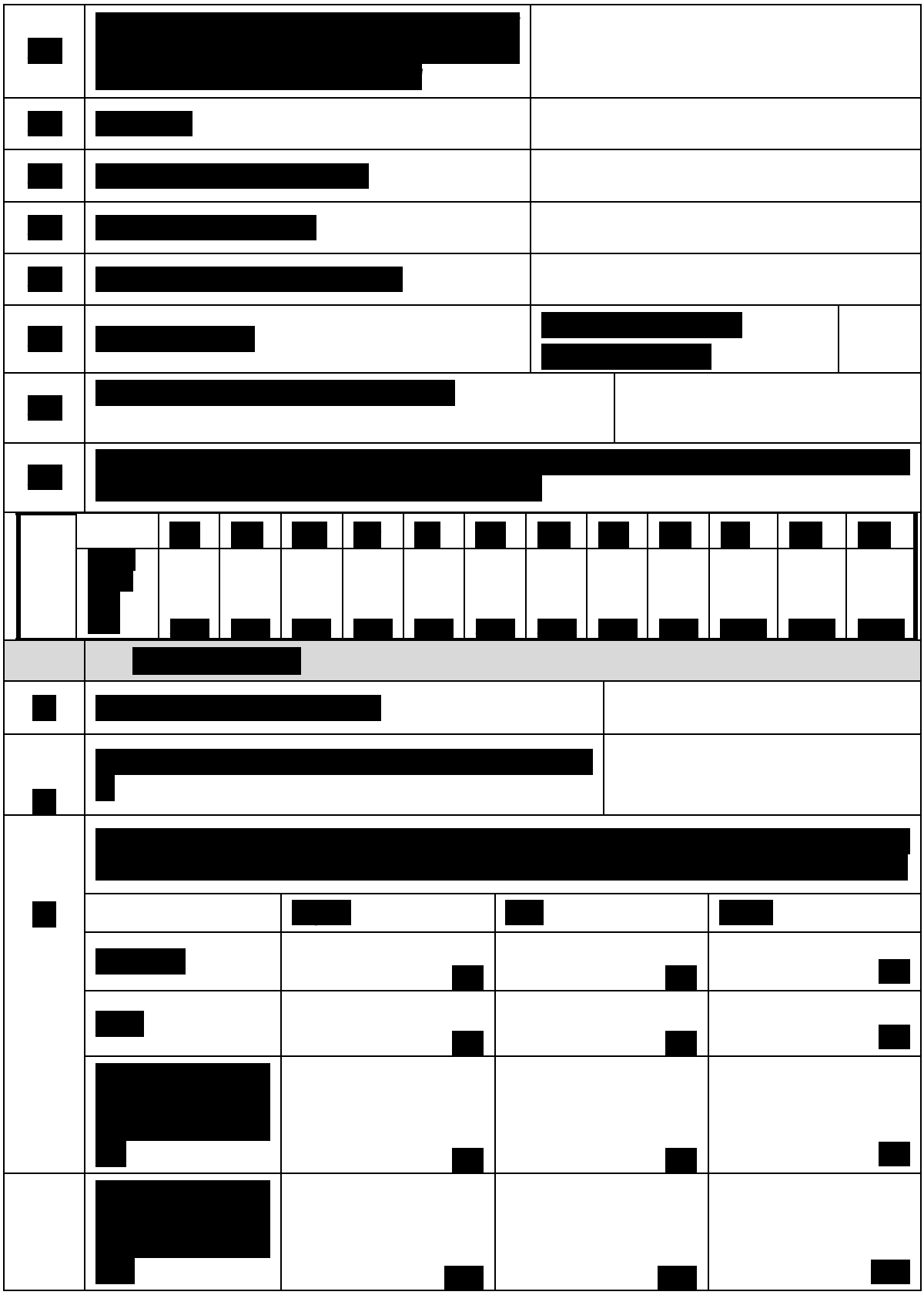
## 5.1 Creole version of the survey form

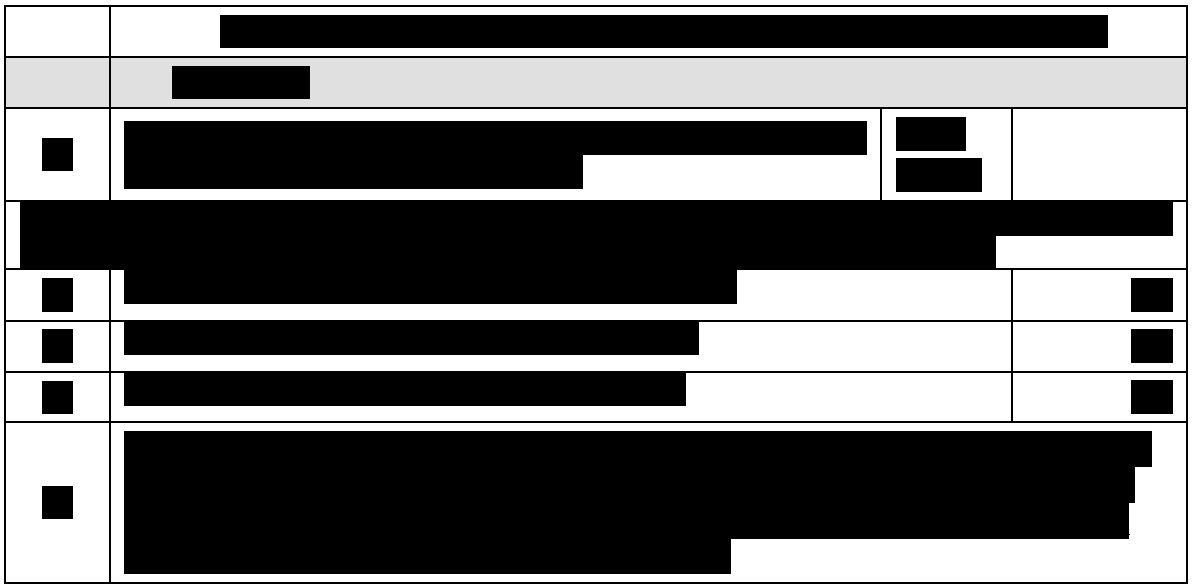
[redacted]

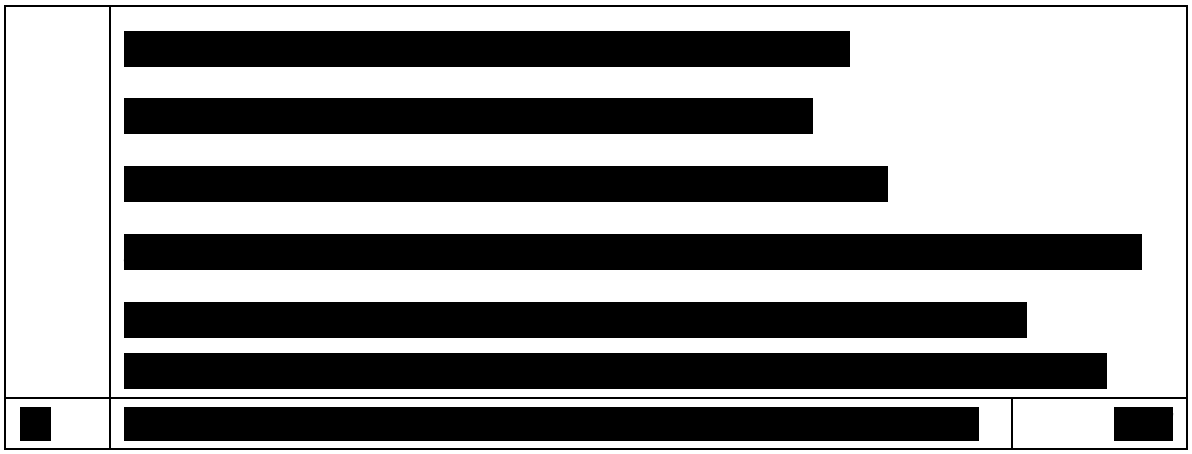
## *Evalyasyon sou kòman nou itilize chabon nan lekòl yo: PaP, Haiti*

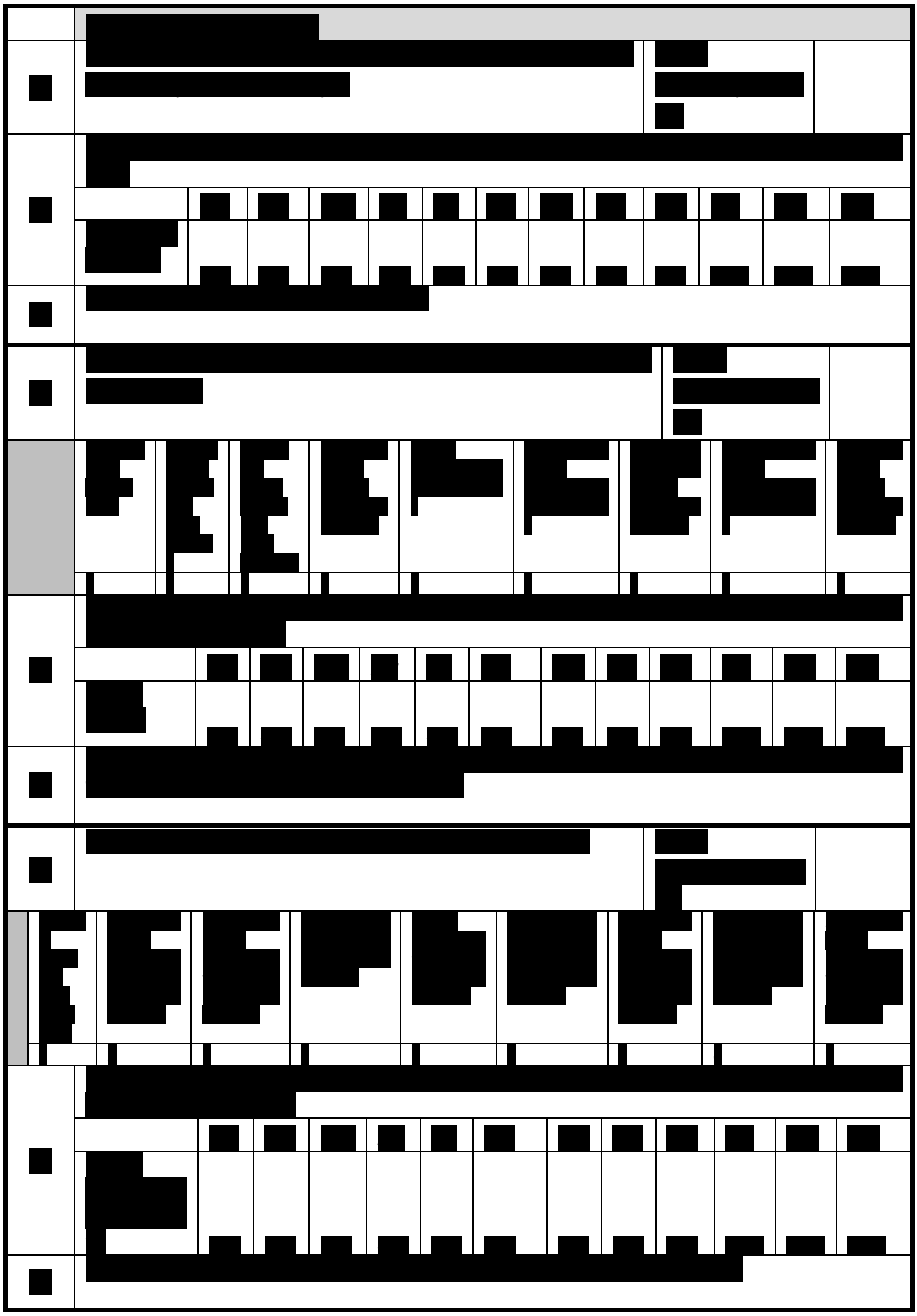
[redacted]

| | | | |
|---|---|---|---|
| | [redacted] | | |
| | [redacted] | | |
| [redacted] | [redacted] | [redacted] | |
| [redacted] | [redacted] | [redacted] | |
| [redacted] | [redacted] | [redacted] | |
| [redacted] | [redacted] | [redacted] | |
| [redacted] | [redacted] | | |
| [redacted] | [redacted] | | |
| [redacted] | [redacted] | | |
| [redacted] | [redacted] | | |
| [redacted] | [redacted] | | |
| [redacted] | [redacted] | | |
| [redacted] | [redacted] | | |









[redacted]

TYPE OF STOVE..1..... NUMBER OF BURNERS.....3.....

| | | | Morning (AM) | | | | | | | | | | | | Afternoon (PM) | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | Circumference (cm) | Depth (cm) | 0.00 - 1.00 | 1.00 - 2.00 | 2.00 - 3.00 | 3.00 - 4.00 | 4.00 - 5.00 | 5.00 - 6.00 | 6.00 - 7.00 | 7.00 - 8.00 | 8.00 - 9.00 | 9.00 - 10.00 | 10.00 - 11.00 | 11.00 - 12.00 | 12.00 - 1.00 | 1.00 - 2.00 | 2.00 - 3.00 | 3.00 - 4.00 | 4.00 - 5.00 | 5.00 - 6.00 | 6.00 - 7.00 | 7.00 - 8.00 | 8.00 - 9.00 | 9.00 - 10.00 | 10.00 - 11.00 | 11.00 - 12.00 |
| Pot 1 | 70 | 20 | | | | | | | x | x | x | | | x | x | | | | | x | x | X | | | | |
| Pot 2 | 102 | 40 | x | x | x | x | x | x | x | x | x | x | x | x | x | | | | | | | | | | x | x |
| Pot3 | | | | | | | | | | | | | | | | | | | | | | | | | | |
| Pot 4 | | | | | | | | | | | | | | | | | | | | | | | | | | |

[redacted]

Stove 1:

TYPE OF STOVE..... NUMBER OF BURNERS.....

| | | | Morning (AM) | | | | | | | | | | | | Afternoon (PM) | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | Circumference (cm) | Depth (cm) | 0.00 - 1.00 | 1.00 - 2.00 | 2.00 - 3.00 | 3.00 - 4.00 | 4.00 - 5.00 | 5.00 - 6.00 | 6.00 - 7.00 | 7.00 - 8.00 | 8.00 - 9.00 | 9.00 - 10.00 | 10.00 - 11.00 | 11.00 - 12.00 | 12.00 - 1.00 | 1.00 - 2.00 | 2.00 - 3.00 | 3.00 - 4.00 | 4.00 - 5.00 | 5.00 - 6.00 | 6.00 - 7.00 | 7.00 - 8.00 | 8.00 - 9.00 | 9.00 - 10.00 | 10.00 - 11.00 | 11.00 - 12.00 |
| Pot 1 | | | | | | | | | | | | | | | | | | | | | | | | | | |
| Pot 2 | | | | | | | | | | | | | | | | | | | | | | | | | | |
| Pot3 | | | | | | | | | | | | | | | | | | | | | | | | | | |
| Pot 4 | | | | | | | | | | | | | | | | | | | | | | | | | | |

Stove 2:

**TYPE OF STOVE…… NUMBER OF BURNERS……**

| | | | Morning (AM) | | | | | | | | | | | | Afternoon (PM) | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | Circumference (cm) | Depth (cm) | 0.00 - 1.00 | 1.00 - 2.00 | 2.00 - 3.00 | 3.00 - 4.00 | 4.00 - 5.00 | 5.00 - 6.00 | 6.00 - 7.00 | 7.00 - 8.00 | 8.00 - 9.00 | 9.00 - 10.00 | 10.00 - 11.00 | 11.00 - 12.00 | 12.00 - 1.00 | 1.00 - 2.00 | 2.00 - 3.00 | 3.00 - 4.00 | 4.00 - 5.00 | 5.00 - 6.00 | 6.00 - 7.00 | 7.00 - 8.00 | 8.00 - 9.00 | 9.00 - 10.00 | 10.00 - 11.00 | 11.00 - 12.00 |
| Pot 1 | | | | | | | | | | | | | | | | | | | | | | | | | | |
| Pot 2 | | | | | | | | | | | | | | | | | | | | | | | | | | |
| Pot3 | | | | | | | | | | | | | | | | | | | | | | | | | | |
| Pot 4 | | | | | | | | | | | | | | | | | | | | | | | | | | |

Stove 3:

**TYPE OF STOVE…… NUMBER OF BURNERS……**

| | | | Morning (AM) | | | | | | | | | | | | Afternoon (PM) | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | Circumference (cm) | Depth (cm) | 0.00 - 1.00 | 1.00 - 2.00 | 2.00 - 3.00 | 3.00 - 4.00 | 4.00 - 5.00 | 5.00 - 6.00 | 6.00 - 7.00 | 7.00 - 8.00 | 8.00 - 9.00 | 9.00 - 10.00 | 10.00 - 11.00 | 11.00 - 12.00 | 12.00 - 1.00 | 1.00 - 2.00 | 2.00 - 3.00 | 3.00 - 4.00 | 4.00 - 5.00 | 5.00 - 6.00 | 6.00 - 7.00 | 7.00 - 8.00 | 8.00 - 9.00 | 9.00 - 10.00 | 10.00 - 11.00 | 11.00 - 12.00 |
| Pot 1 | | | | | | | | | | | | | | | | | | | | | | | | | | |
| Pot 2 | | | | | | | | | | | | | | | | | | | | | | | | | | |
| Pot3 | | | | | | | | | | | | | | | | | | | | | | | | | | |
| Pot 4 | | | | | | | | | | | | | | | | | | | | | | | | | | |

Stove 4:

**TYPE OF STOVE…… NUMBER OF BURNERS……**

| | | | Morning (AM) | | | | | | | | | | | | Afternoon (PM) | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | Circumference (cm) | Depth (cm) | 0.00 - 1.00 | 1.00 - 2.00 | 2.00 - 3.00 | 3.00 - 4.00 | 4.00 - 5.00 | 5.00 - 6.00 | 6.00 - 7.00 | 7.00 - 8.00 | 8.00 - 9.00 | 9.00 - 10.00 | 10.00 - 11.00 | 11.00 - 12.00 | 12.00 - 1.00 | 1.00 - 2.00 | 2.00 - 3.00 | 3.00 - 4.00 | 4.00 - 5.00 | 5.00 - 6.00 | 6.00 - 7.00 | 7.00 - 8.00 | 8.00 - 9.00 | 9.00 - 10.00 | 10.00 - 11.00 | 11.00 - 12.00 |
| Pot 1 | | | | | | | | | | | | | | | | | | | | | | | | | | |
| Pot 2 | | | | | | | | | | | | | | | | | | | | | | | | | | |
| Pot3 | | | | | | | | | | | | | | | | | | | | | | | | | | |
| Pot 4 | | | | | | | | | | | | | | | | | | | | | | | | | | |

Stove 5:

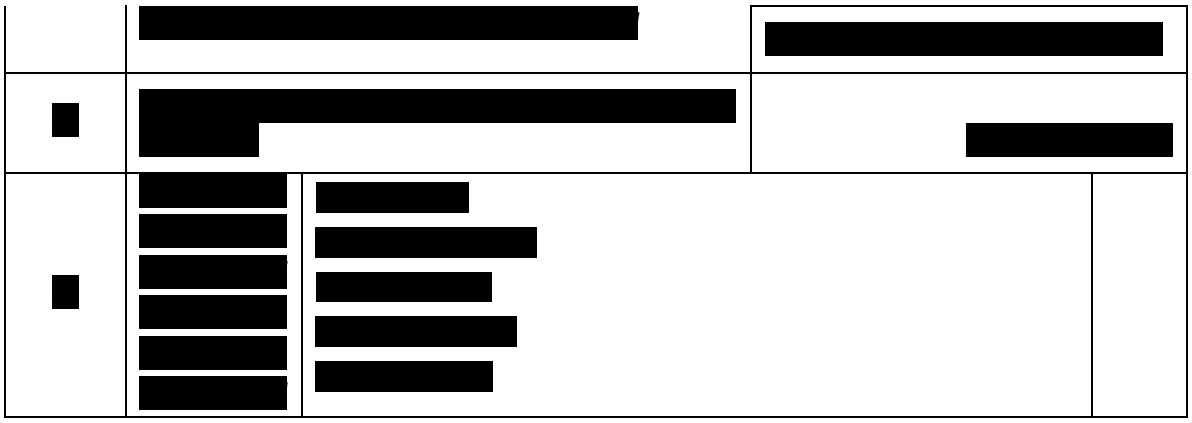
**TYPE OF STOVE…… NUMBER OF BURNERS……**

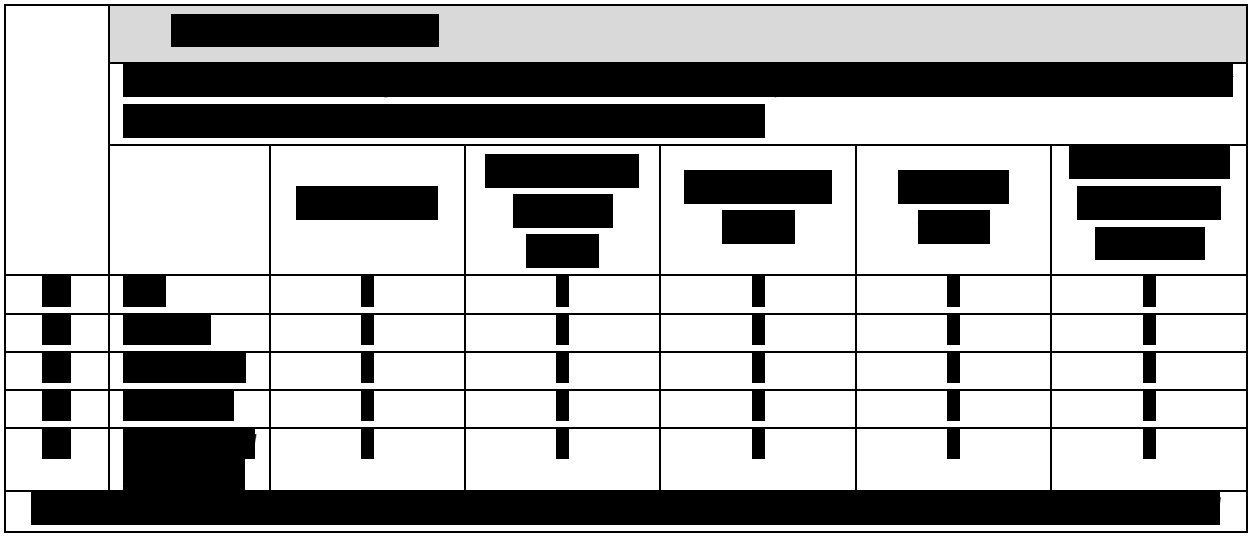
| | | | Morning (AM) | | | | | | | | | | | | Afternoon (PM) | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | Circumference (cm) | Depth (cm) | 0.00 - 1.00 | 1.00 - 2.00 | 2.00 - 3.00 | 3.00 - 4.00 | 4.00 - 5.00 | 5.00 - 6.00 | 6.00 - 7.00 | 7.00 - 8.00 | 8.00 - 9.00 | 9.00 - 10.00 | 10.00 - 11.00 | 11.00 - 12.00 | 12.00 - 1.00 | 1.00 - 2.00 | 2.00 - 3.00 | 3.00 - 4.00 | 4.00 - 5.00 | 5.00 - 6.00 | 6.00 - 7.00 | 7.00 - 8.00 | 8.00 - 9.00 | 9.00 - 10.00 | 10.00 - 11.00 | 11.00 - 12.00 |
| Pot 1 | | | | | | | | | | | | | | | | | | | | | | | | | | |
| Pot 2 | | | | | | | | | | | | | | | | | | | | | | | | | | |
| Pot3 | | | | | | | | | | | | | | | | | | | | | | | | | | |
| Pot 4 | | | | | | | | | | | | | | | | | | | | | | | | | | |

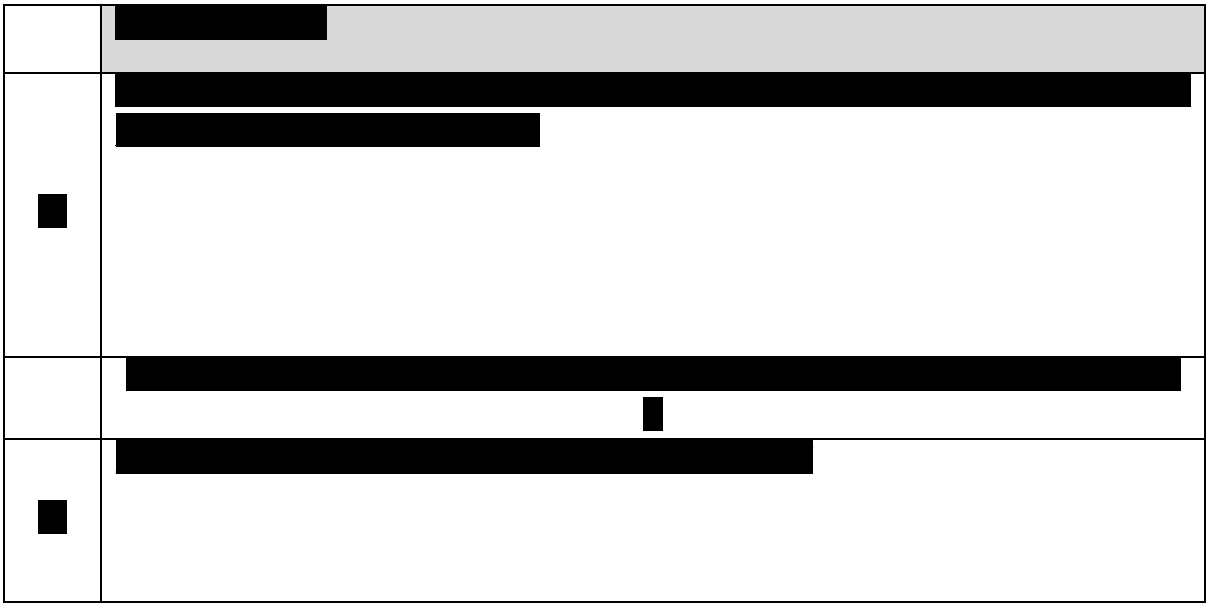
Stove 6

**TYPE OF STOVE…… NUMBER OF BURNERS……**

| | | | Morning (AM) | | | | | | | | | | | | Afternoon (PM) | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | Circumference (cm) | Depth (cm) | 0.00 - 1.00 | 1.00 - 2.00 | 2.00 - 3.00 | 3.00 - 4.00 | 4.00 - 5.00 | 5.00 - 6.00 | 6.00 - 7.00 | 7.00 - 8.00 | 8.00 - 9.00 | 9.00 - 10.00 | 10.00 - 11.00 | 11.00 - 12.00 | 12.00 - 1.00 | 1.00 - 2.00 | 2.00 - 3.00 | 3.00 - 4.00 | 4.00 - 5.00 | 5.00 - 6.00 | 6.00 - 7.00 | 7.00 - 8.00 | 8.00 - 9.00 | 9.00 - 10.00 | 10.00 - 11.00 | 11.00 - 12.00 |
| Pot 1 | | | | | | | | | | | | | | | | | | | | | | | | | | |
| Pot 2 | | | | | | | | | | | | | | | | | | | | | | | | | | |
| Pot3 | | | | | | | | | | | | | | | | | | | | | | | | | | |
| Pot 4 | | | | | | | | | | | | | | | | | | | | | | | | | | |



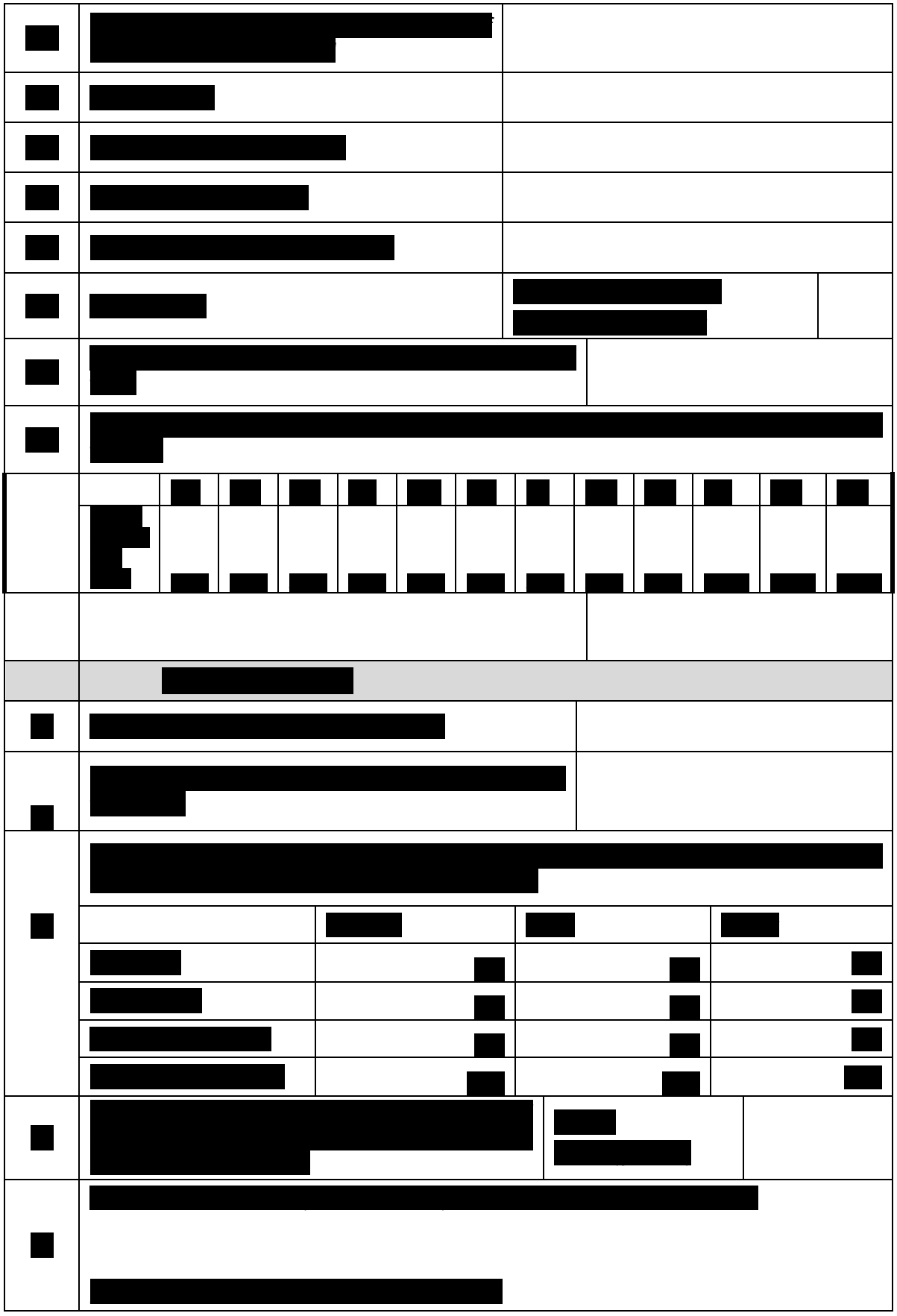


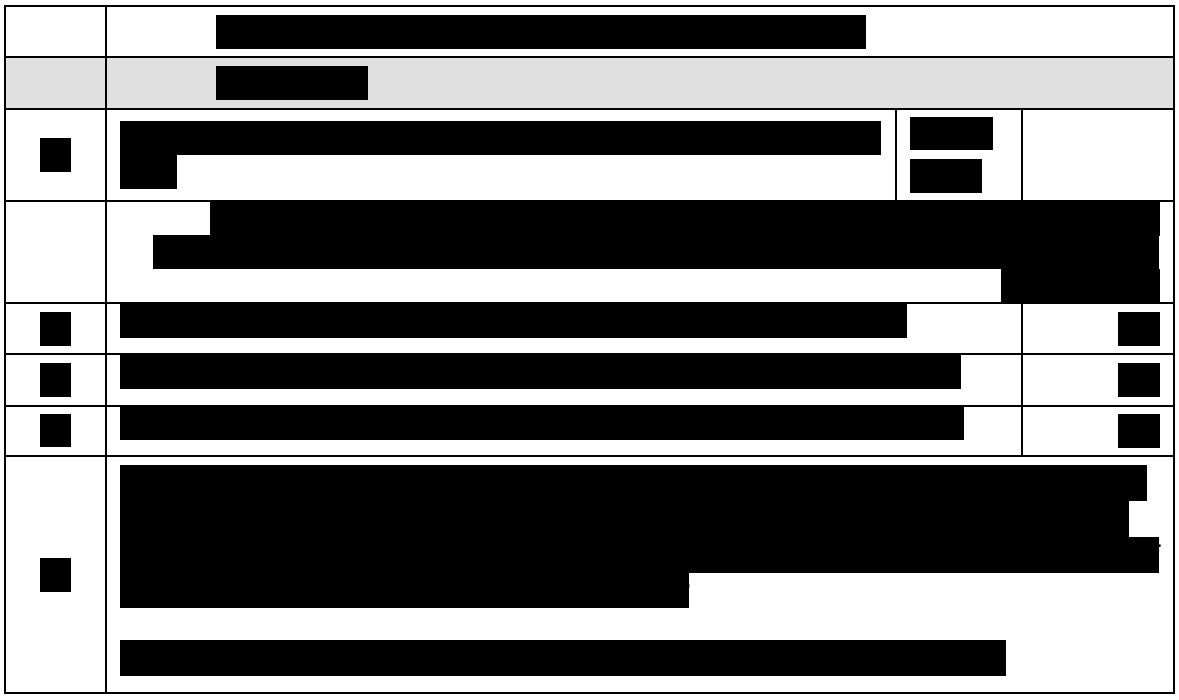


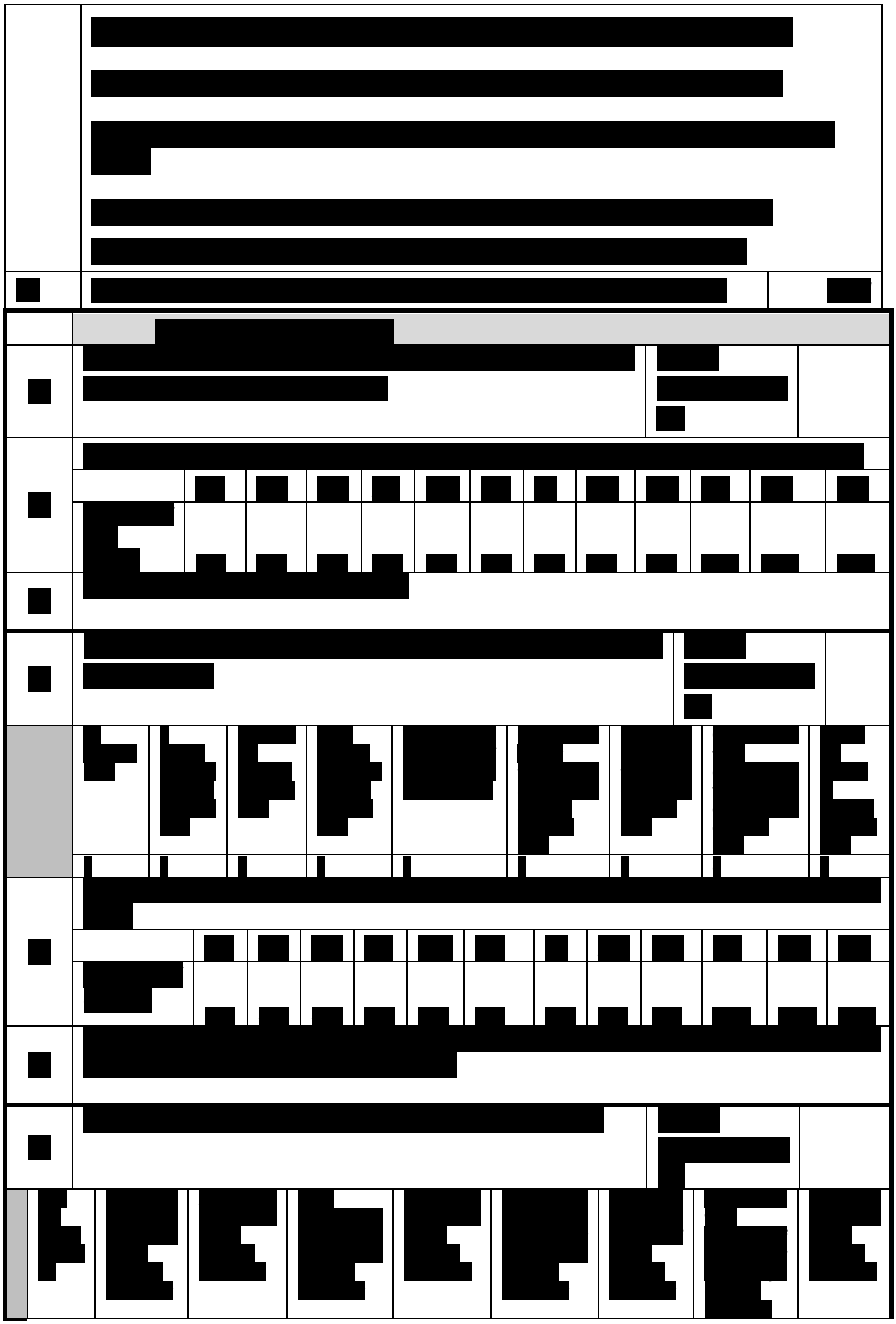
# Port-au-Prince Schools Baseline Charcoal Consumption Questionnaire: English Version

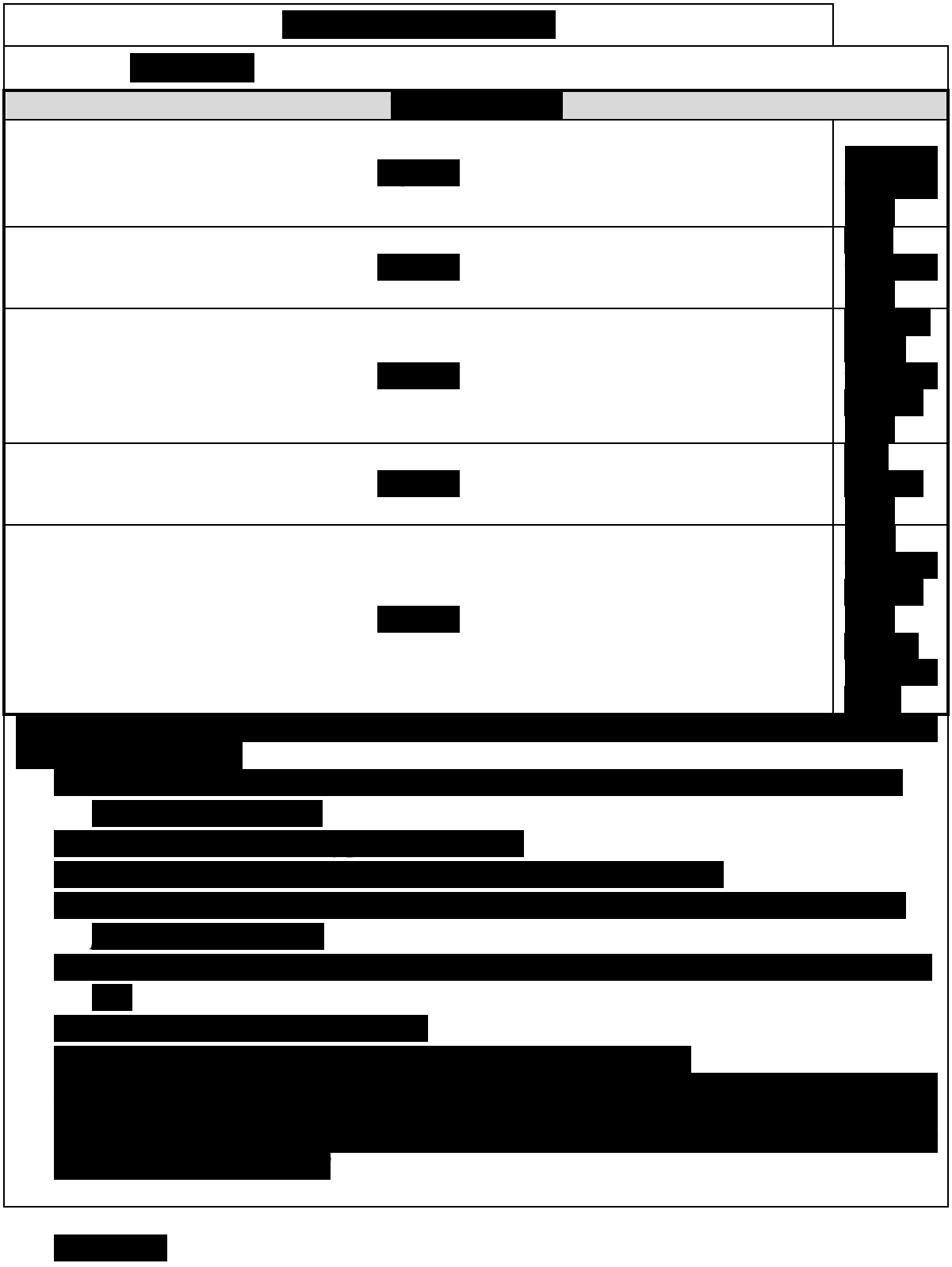
## IMPROVED COOKING TECHNOLOGY PROGRAM

[redacted]









TYPE OF STOVE..1..... NUMBER OF BURNERS..3.....

| | | | Morning (AM) | | | | | | | | | | | | Afternoon (PM) | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | Circumference (cm) | Depth (cm) | 0.00 - 1.00 | 1.00 - 2.00 | 2.00 - 3.00 | 3.00 - 4.00 | 4.00 - 5.00 | 5.00 - 6.00 | 6.00 - 7.00 | 7.00 - 8.00 | 8.00 - 9.00 | 9.00 - 10.00 | 10.00 - 11.00 | 11.00 - 12.00 | 12.00 - 1.00 | 1.00 - 2.00 | 2.00 - 3.00 | 3.00 - 4.00 | 4.00 - 5.00 | 5.00 - 6.00 | 6.00 - 7.00 | 7.00 - 8.00 | 8.00 - 9.00 | 9.00 - 10.00 | 10.00 - 11.00 | 11.00 - 12.00 |
| Pot 1 | 70 | 20 | | | | | | | x | x | x | | | x | x | | | | | x | x | X | | | | |
| Pot 2 | 102 | 40 | x | x | x | x | x | x | x | x | x | x | x | x | x | | | | | | | | | | x | x |
| Pot3 | | | | | | | | | | | | | | | | | | | | | | | | | | |
| Pot 4 | | | | | | | | | | | | | | | | | | | | | | | | | | |

[redacted]

Stove 1:

**TYPE OF STOVE…… NUMBER OF BURNERS……**

| | | | Morning (AM) | | | | | | | | | | | | Afternoon (PM) | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | Circumference (cm) | Depth (cm) | 0.00 - 1.00 | 1.00 - 2.00 | 2.00 - 3.00 | 3.00 - 4.00 | 4.00 - 5.00 | 5.00 - 6.00 | 6.00 - 7.00 | 7.00 - 8.00 | 8.00 - 9.00 | 9.00 - 10.00 | 10.00 - 11.00 | 11.00 - 12.00 | 12.00 - 1.00 | 1.00 - 2.00 | 2.00 - 3.00 | 3.00 - 4.00 | 4.00 - 5.00 | 5.00 - 6.00 | 6.00 - 7.00 | 7.00 - 8.00 | 8.00 - 9.00 | 9.00 - 10.00 | 10.00 - 11.00 | 11.00 - 12.00 |
| Pot 1 | | | | | | | | | | | | | | | | | | | | | | | | | | |
| Pot 2 | | | | | | | | | | | | | | | | | | | | | | | | | | |
| Pot3 | | | | | | | | | | | | | | | | | | | | | | | | | | |
| Pot 4 | | | | | | | | | | | | | | | | | | | | | | | | | | |

Stove 2:

**TYPE OF STOVE…… NUMBER OF BURNERS……**

| | | | Morning (AM) | | | | | | | | | | | | Afternoon (PM) | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | Circumference (cm) | Depth (cm) | 0.00 - 1.00 | 1.00 - 2.00 | 2.00 - 3.00 | 3.00 - 4.00 | 4.00 - 5.00 | 5.00 - 6.00 | 6.00 - 7.00 | 7.00 - 8.00 | 8.00 - 9.00 | 9.00 - 10.00 | 10.00 - 11.00 | 11.00 - 12.00 | 12.00 - 1.00 | 1.00 - 2.00 | 2.00 - 3.00 | 3.00 - 4.00 | 4.00 - 5.00 | 5.00 - 6.00 | 6.00 - 7.00 | 7.00 - 8.00 | 8.00 - 9.00 | 9.00 - 10.00 | 10.00 - 11.00 | 11.00 - 12.00 |
| Pot 1 | | | | | | | | | | | | | | | | | | | | | | | | | | |
| Pot 2 | | | | | | | | | | | | | | | | | | | | | | | | | | |
| Pot3 | | | | | | | | | | | | | | | | | | | | | | | | | | |
| Pot 4 | | | | | | | | | | | | | | | | | | | | | | | | | | |

Stove 3:

**TYPE OF STOVE…… NUMBER OF BURNERS……**

| | | | Morning (AM) | | | | | | | | | | | | Afternoon (PM) | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | Circumference (cm) | Depth (cm) | 0.00 - 1.00 | 1.00 - 2.00 | 2.00 - 3.00 | 3.00 - 4.00 | 4.00 - 5.00 | 5.00 - 6.00 | 6.00 - 7.00 | 7.00 - 8.00 | 8.00 - 9.00 | 9.00 - 10.00 | 10.00 - 11.00 | 11.00 - 12.00 | 12.00 - 1.00 | 1.00 - 2.00 | 2.00 - 3.00 | 3.00 - 4.00 | 4.00 - 5.00 | 5.00 - 6.00 | 6.00 - 7.00 | 7.00 - 8.00 | 8.00 - 9.00 | 9.00 - 10.00 | 10.00 - 11.00 | 11.00 - 12.00 |
| Pot 1 | | | | | | | | | | | | | | | | | | | | | | | | | | |
| Pot 2 | | | | | | | | | | | | | | | | | | | | | | | | | | |
| Pot3 | | | | | | | | | | | | | | | | | | | | | | | | | | |
| Pot 4 | | | | | | | | | | | | | | | | | | | | | | | | | | |

Stove 4:

**TYPE OF STOVE…… NUMBER OF BURNERS……**

| | | | Morning (AM) | | | | | | | | | | | | Afternoon (PM) | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | Circumference (cm) | Depth (cm) | 0.00 - 1.00 | 1.00 - 2.00 | 2.00 - 3.00 | 3.00 - 4.00 | 4.00 - 5.00 | 5.00 - 6.00 | 6.00 - 7.00 | 7.00 - 8.00 | 8.00 - 9.00 | 9.00 - 10.00 | 10.00 - 11.00 | 11.00 - 12.00 | 12.00 - 1.00 | 1.00 - 2.00 | 2.00 - 3.00 | 3.00 - 4.00 | 4.00 - 5.00 | 5.00 - 6.00 | 6.00 - 7.00 | 7.00 - 8.00 | 8.00 - 9.00 | 9.00 - 10.00 | 10.00 - 11.00 | 11.00 - 12.00 |
| Pot 1 | | | | | | | | | | | | | | | | | | | | | | | | | | |
| Pot 2 | | | | | | | | | | | | | | | | | | | | | | | | | | |
| Pot3 | | | | | | | | | | | | | | | | | | | | | | | | | | |
| Pot 4 | | | | | | | | | | | | | | | | | | | | | | | | | | |

Stove 5:

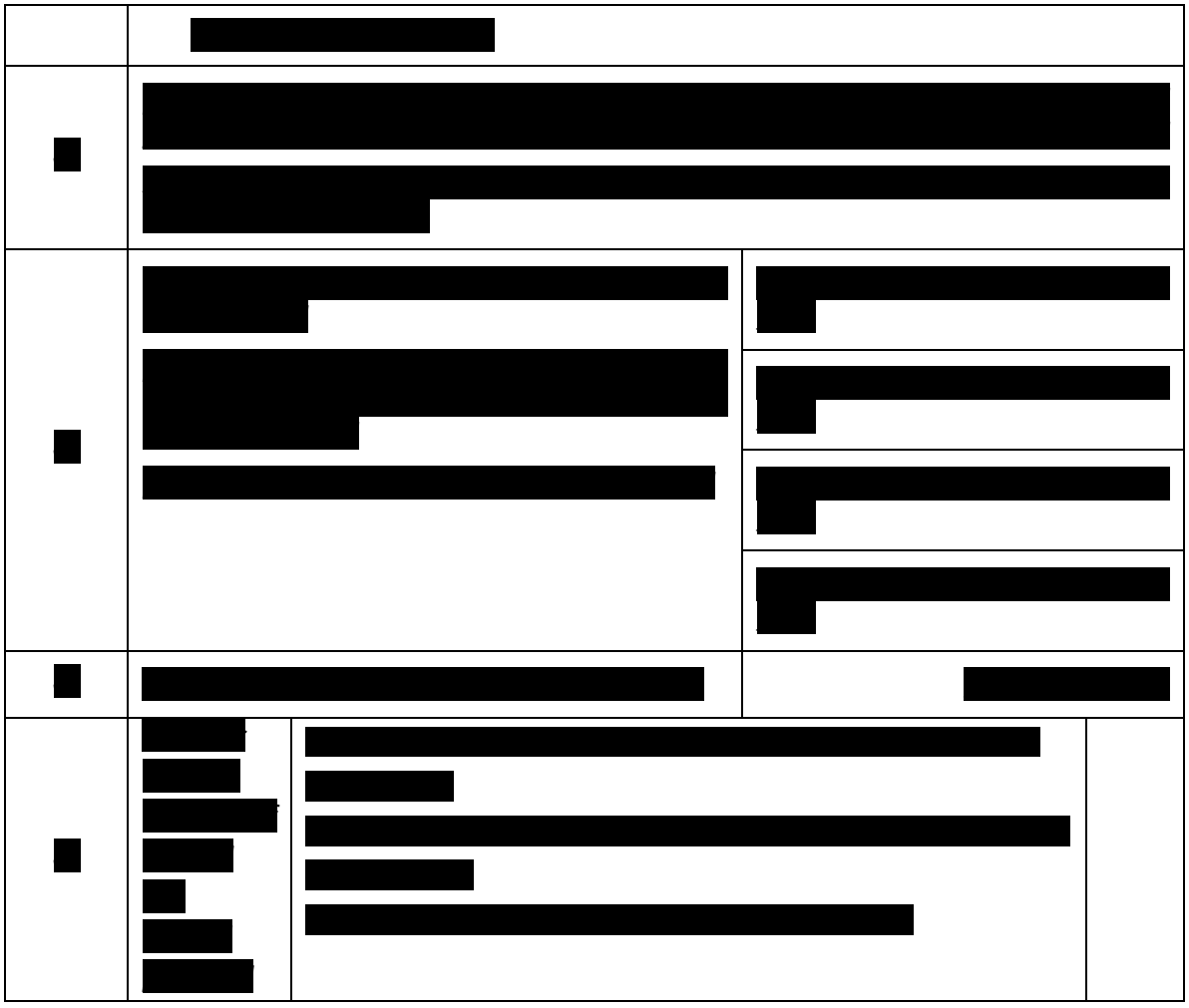
**TYPE OF STOVE…… NUMBER OF BURNERS……**

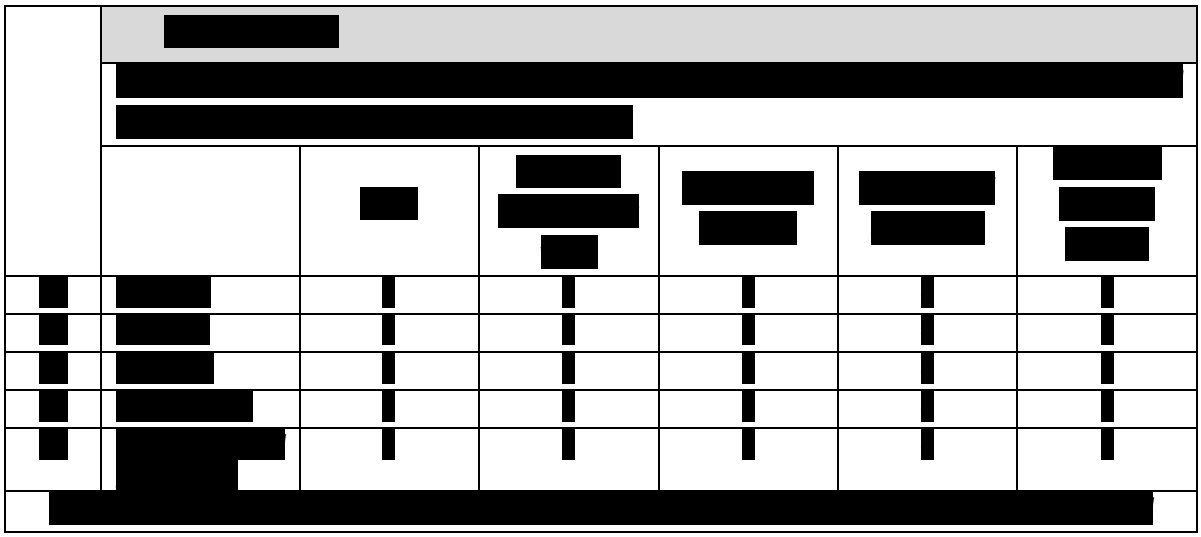
| | | | Morning (AM) | | | | | | | | | | | | Afternoon (PM) | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | Circumference (cm) | Depth (cm) | 0.00 - 1.00 | 1.00 - 2.00 | 2.00 - 3.00 | 3.00 - 4.00 | 4.00 - 5.00 | 5.00 - 6.00 | 6.00 - 7.00 | 7.00 - 8.00 | 8.00 - 9.00 | 9.00 - 10.00 | 10.00 - 11.00 | 11.00 - 12.00 | 12.00 - 1.00 | 1.00 - 2.00 | 2.00 - 3.00 | 3.00 - 4.00 | 4.00 - 5.00 | 5.00 - 6.00 | 6.00 - 7.00 | 7.00 - 8.00 | 8.00 - 9.00 | 9.00 - 10.00 | 10.00 - 11.00 | 11.00 - 12.00 |
| Pot 1 | | | | | | | | | | | | | | | | | | | | | | | | | | |
| Pot 2 | | | | | | | | | | | | | | | | | | | | | | | | | | |
| Pot3 | | | | | | | | | | | | | | | | | | | | | | | | | | |
| Pot 4 | | | | | | | | | | | | | | | | | | | | | | | | | | |

Stove 6:

**TYPE OF STOVE…… NUMBER OF BURNERS……**

| | | | Morning (AM) | | | | | | | | | | | | Afternoon (PM) | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | Circumference (cm) | Depth (cm) | 0.00 - 1.00 | 1.00 - 2.00 | 2.00 - 3.00 | 3.00 - 4.00 | 4.00 - 5.00 | 5.00 - 6.00 | 6.00 - 7.00 | 7.00 - 8.00 | 8.00 - 9.00 | 9.00 - 10.00 | 10.00 - 11.00 | 11.00 - 12.00 | 12.00 - 1.00 | 1.00 - 2.00 | 2.00 - 3.00 | 3.00 - 4.00 | 4.00 - 5.00 | 5.00 - 6.00 | 6.00 - 7.00 | 7.00 - 8.00 | 8.00 - 9.00 | 9.00 - 10.00 | 10.00 - 11.00 | 11.00 - 12.00 |
| Pot 1 | | | | | | | | | | | | | | | | | | | | | | | | | | |
| Pot 2 | | | | | | | | | | | | | | | | | | | | | | | | | | |
| Pot3 | | | | | | | | | | | | | | | | | | | | | | | | | | |
| Pot 4 | | | | | | | | | | | | | | | | | | | | | | | | | | |





| | |
|---|---|
| [redacted] | [redacted] |
| | [redacted] |
| [redacted] | [redacted] |

## 5.2 List of schools visited

*Phase 1 list of schools visited*

[redacted]

[redacted]

*Phase 2 list of schools to revisit due to incomplete data collected during Phase 1*

[redacted]

*Phase 2 additional 7 schools identified and visited*

[redacted]

***Exchange rate (approximate at time of report)***

***Document development record***

| | | |
|---|---|---|
| | | |
| | | |

# 1 Executive summary

[redacted]

*Methodology*

[redacted]

*Key results*

[redacted]

# 2 Methods

## 2.1 Roles

[redacted]

[105] For example, the Haitian Household Charcoal Consumption study elaborated for the same Programme of Activities presented coefficients of variation of 56% (on log-transfored data), whereas the coefficient of variation found for this study was 79%.

[redacted]

### Sampling strategy

[redacted]

#### *Sampling from within cities/communal sections*

[redacted]

## 2.2 Sample size determination

[redacted]

## 2.3 Questionnaire development

[redacted]

[106] As per the Haitian 2009 housing and population census

[107] Most SFVs were reluctant to provide this information.

[redacted]

## 2.4 Measurement of charcoal

[redacted]

## 2.5 Quality control

[redacted]

[108] SFVs would refuse to have their charcoal measured at the spot.

[109] See ESMAP, 2007. Haiti: Strategy to Alleviate the Pressure of Fuel Demand on National Woodfuel Resources. Page 4.

# 3 Analysis

## 3.1 Data checking

[redacted]

## 3.2 Average charcoal consumption per day

[redacted]

## 3.3 Accounting for seasonal changes in amount of charcoal fuel used

[redacted]

[110] Each charcoal consumption data point was applied converted to a natural logarithm scale.

[111] Daily charcoal consumption value multiplied by 365 days of the year and divided by 1,000 kg/tonne

[112] Tonnes of charcoal/burner/day multiplied by a factor of 6 as per paragraph 14 of AMS-II.G version 05.0

[113] Note that these values are adimensional due to the nature of the log-transformed data and cannot be directly translated into Kg/household/day units. The geometric mean and aforementioned standard deviation are used to calculate precision levels and not violating the normal distribution assumption.

[redacted]

## 3.4 Summary of findings

[redacted]

| [redacted] | | | |
|---|---|---|---|
| [redacted] | | | |
| [redacted] | | | |
| [redacted] | | | |
| [redacted] | | | |
| [redacted] | | | |

## 3.5 Assessing the difference between types of vendors

[redacted]

# 4 Other factors investigated

[redacted]

[114] This datum is based on mean values (versus lower 95% confidence interval)

[115] Only excludes those lacking information on daily charcoal usage

[116] Standard deviation of log-transformed data

[117] Standard error of log-transformed data

### 4.1 Impact of type of foods cooked

[redacted]

### 4.2 Impact of other uses of charcoal

[redacted]

### 4.3 Impact of charcoal quality

[redacted]

### 4.4 Impact of cooking location

[redacted]

## 5 Comparison with other studies

[redacted]

## 6 References

[redacted]

## Section 1.02 Annex 1. Baseline Charcoal Consumption Questionnaire: English

[redacted]

[redacted]

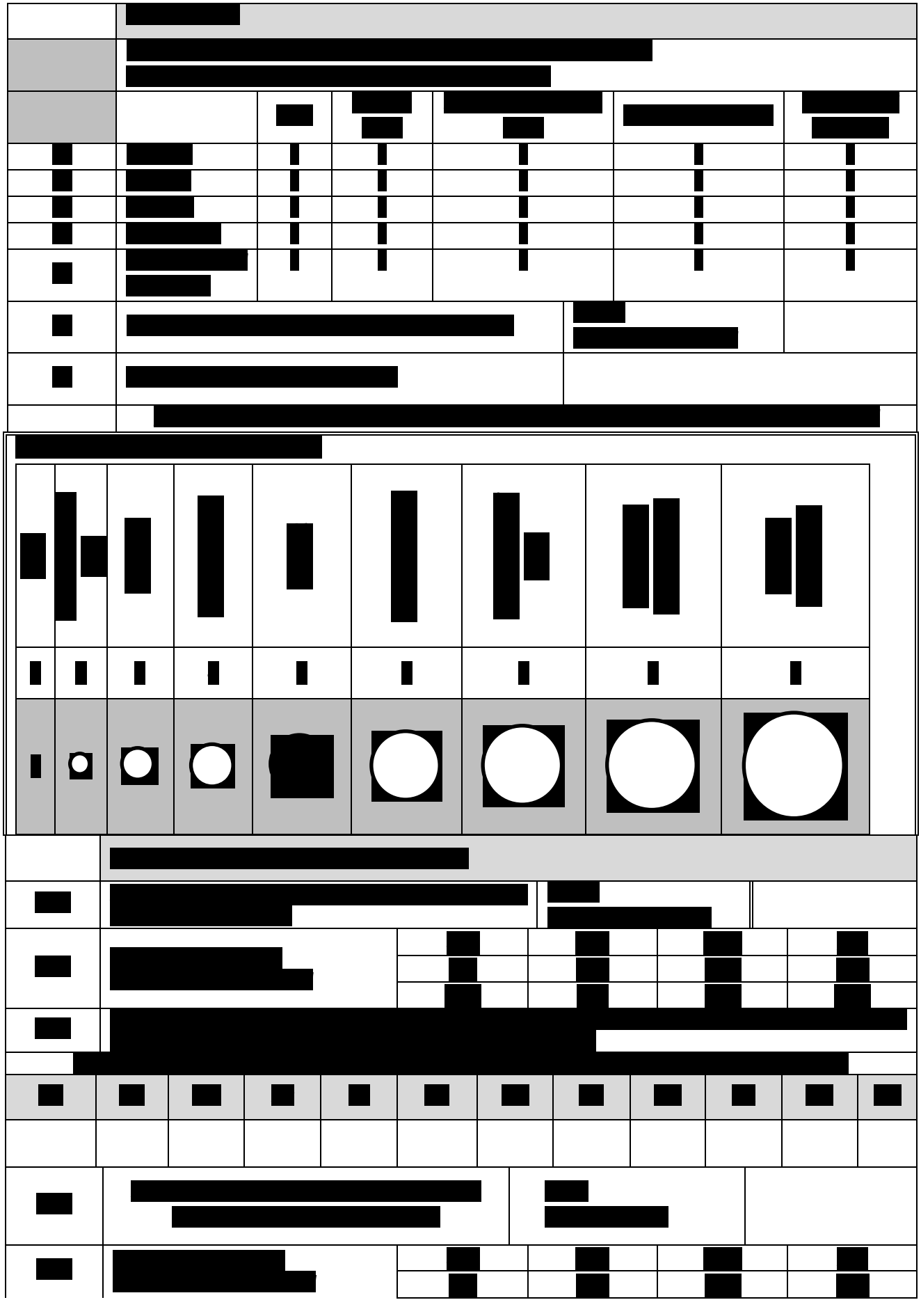
| | |
|---|---|
| | [redacted] |
| [redacted] | |

| | | | |
|---|---|---|---|
| [redacted] | [redacted] | [redacted] | |
| [redacted] | [redacted] | [redacted] | |
| [redacted] | [redacted] | [redacted] | |
| [redacted] | [redacted] | [redacted] | |

| | | |
|---|---|---|
| [redacted] | [redacted] | |
| [redacted] | [redacted] | |
| [redacted] | [redacted] | |
| [redacted] | [redacted] | |
| [redacted] | [redacted] | |
| [redacted] | [redacted] | |
| [redacted] | [redacted] | |
| [redacted] | [redacted] | |
| [redacted] | [redacted] | |
| [redacted] | [redacted] | |

[redacted]

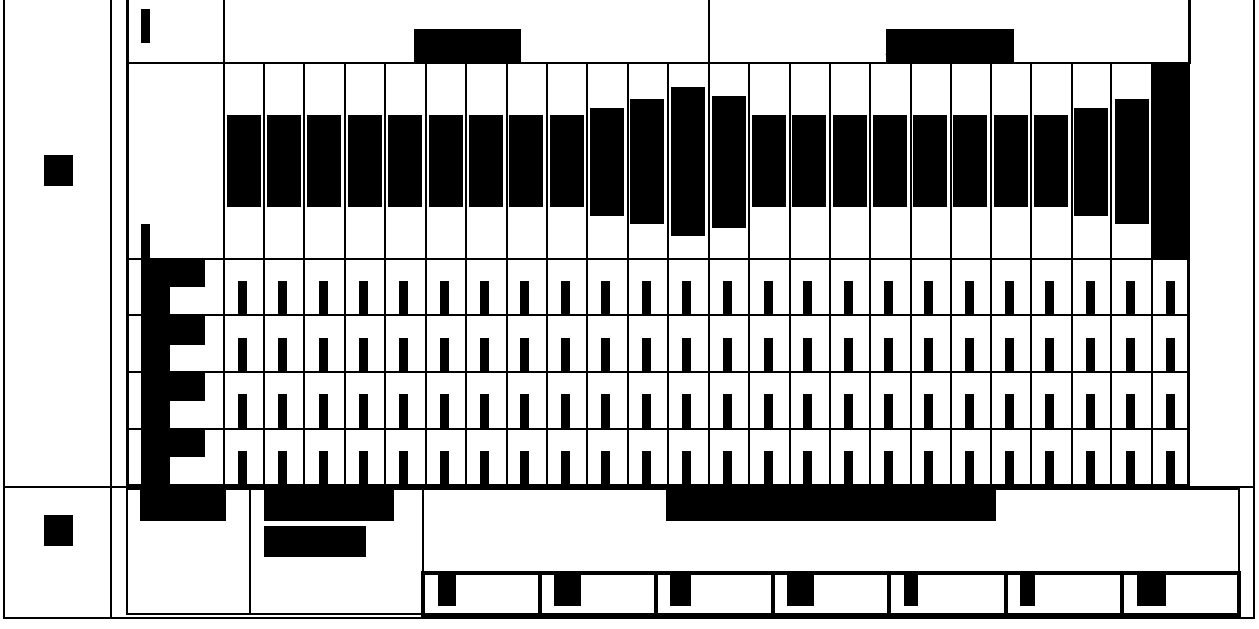
[redacted]

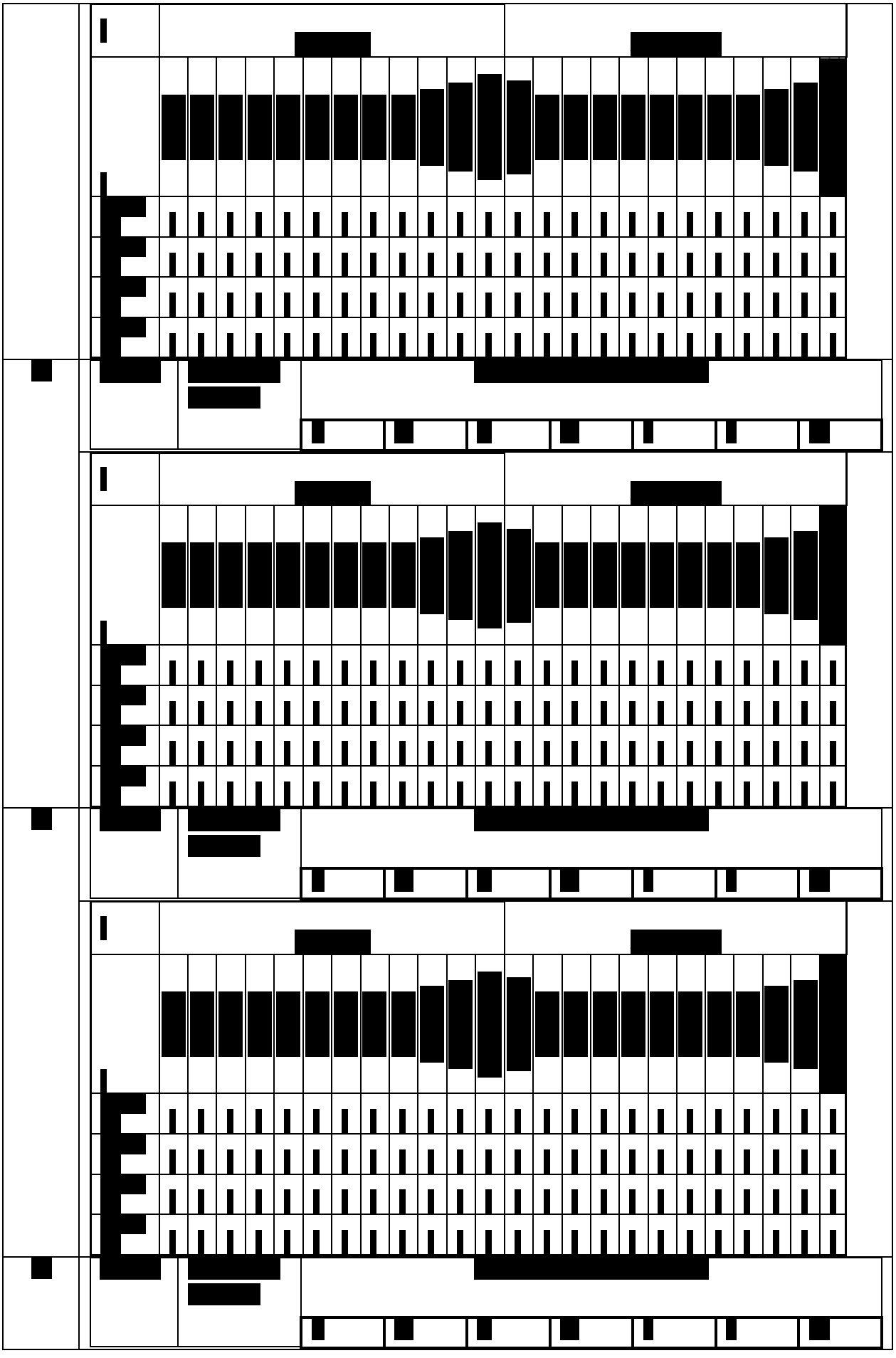


[redacted]

[redacted]

[redacted]





[redacted]

[redacted]

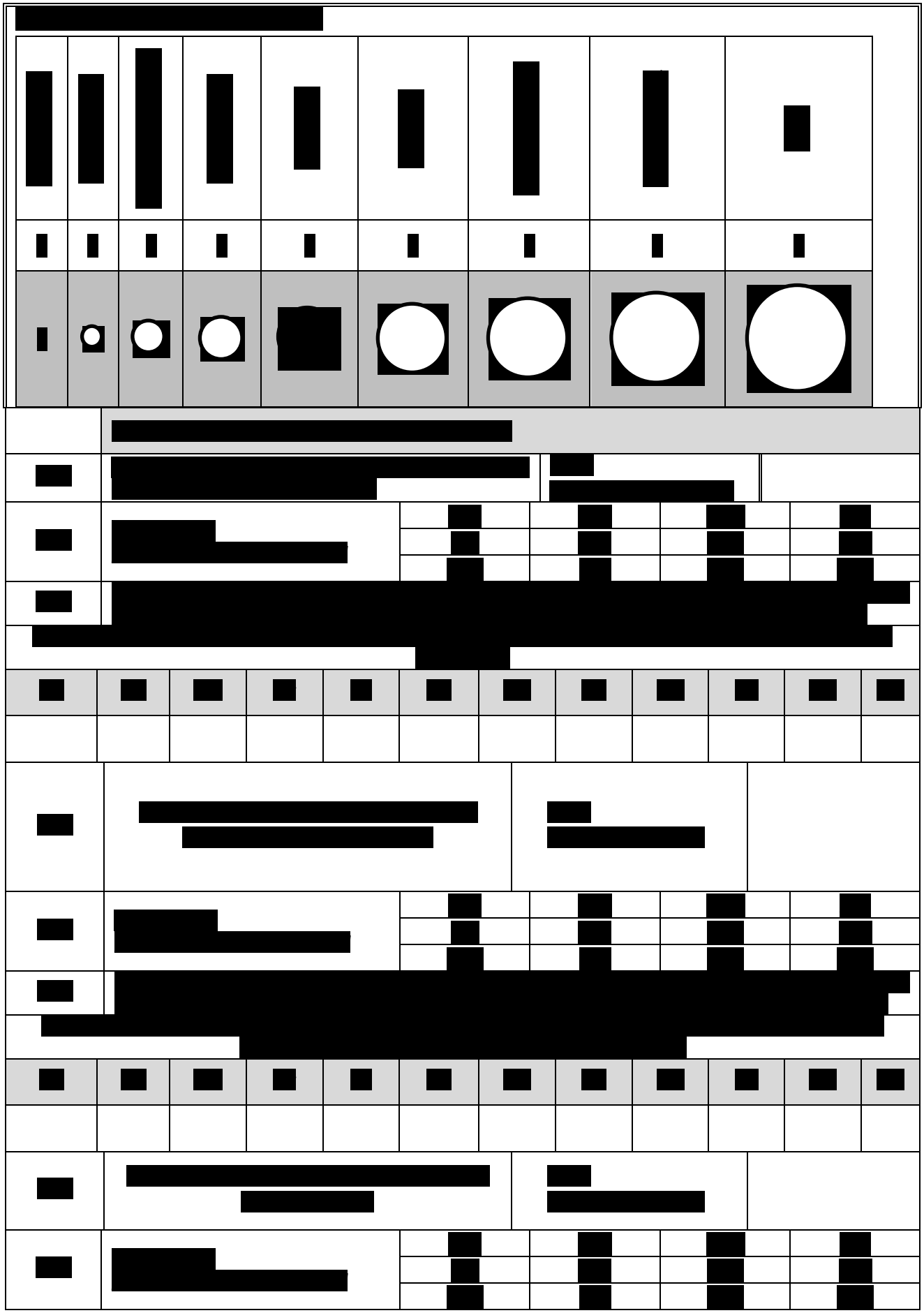
[redacted]

| | | | | | |
|---|---|---|---|---|---|
| | [redacted] | [redacted] | | | |
| | | [redacted] | | | |
| | | [redacted] | | | |
| | | [redacted] | | | |
| [redacted] | [redacted] | | | | |
| | [redacted] | | | | |
| [redacted] | [redacted] | | | | |
| [redacted] | [redacted] | | | | |

[redacted]

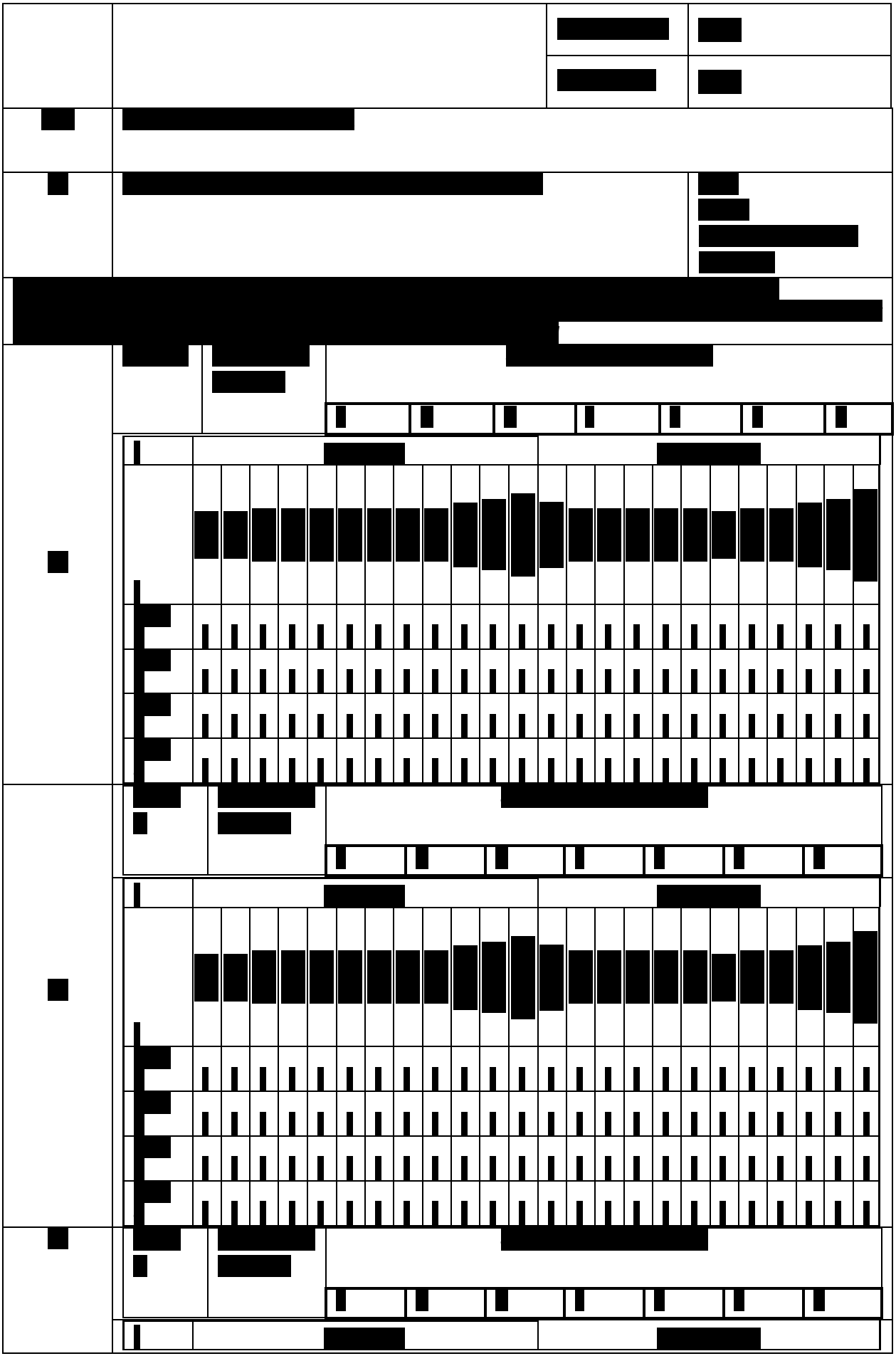
| | | | |
|---|---|---|---|
| | [redacted] | [redacted] | [redacted] |
| [redacted] | [redacted] | [redacted] | |
| [redacted] | [redacted] | [redacted] | |
| [redacted] | [redacted] | [redacted] | |
| [redacted] | [redacted] | [redacted] | |
| [redacted] | [redacted] | [redacted] | |
| [redacted] | [redacted] | | |
| | [redacted] | | |
| [redacted] | [redacted] | | |
| | [redacted] | [redacted] | [redacted] |
| | [redacted] | [redacted] | [redacted] |
| | [redacted] | [redacted] | |

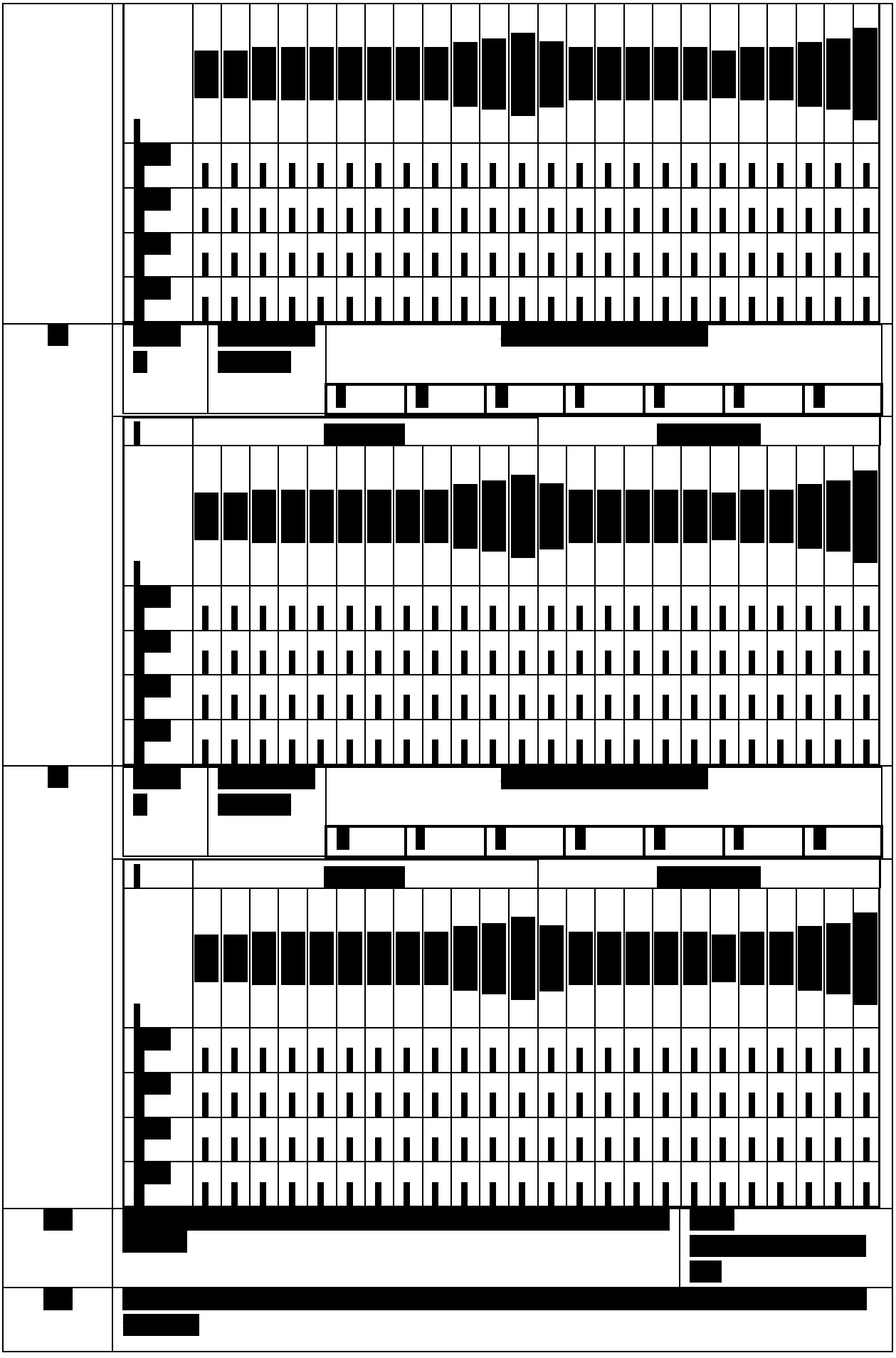
[redacted]



[redacted]

[redacted]





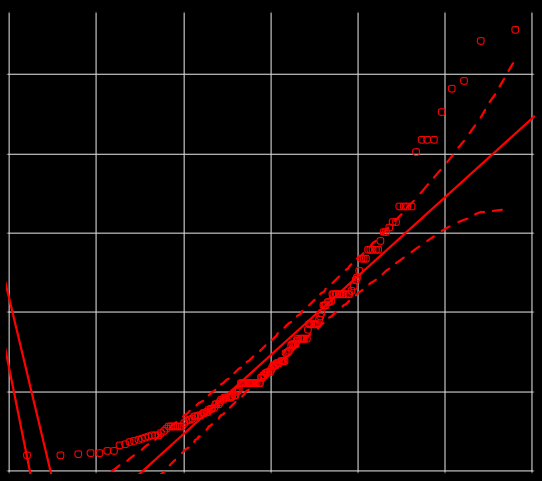
[redacted]

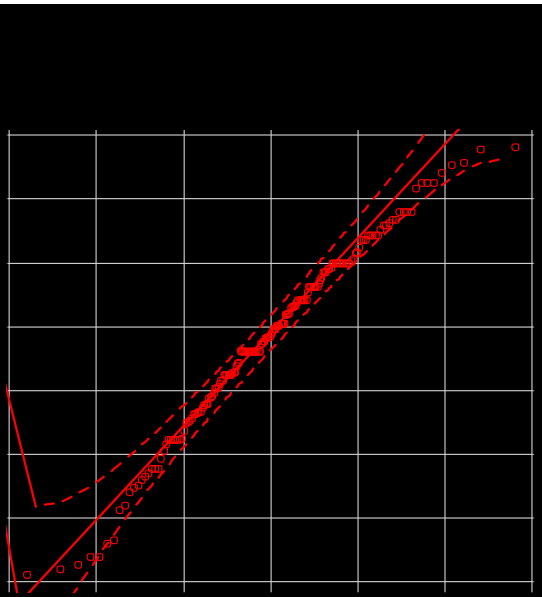
[redacted]

[redacted]

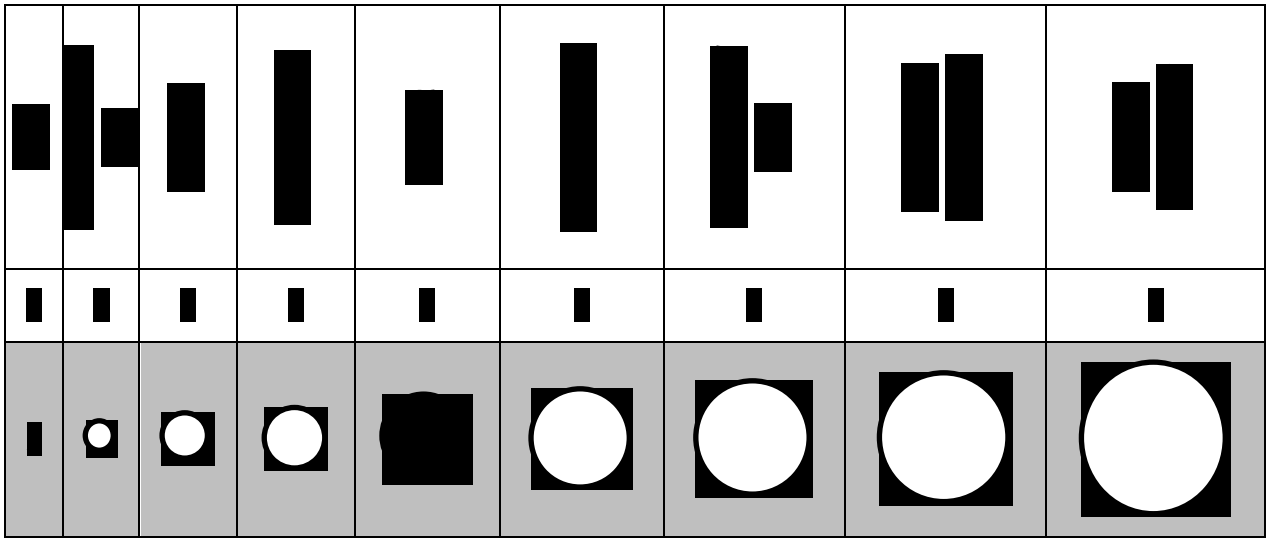
## Section 1.03 Annex 2. Quintile comparison plots before and after log-transformations

[redacted]

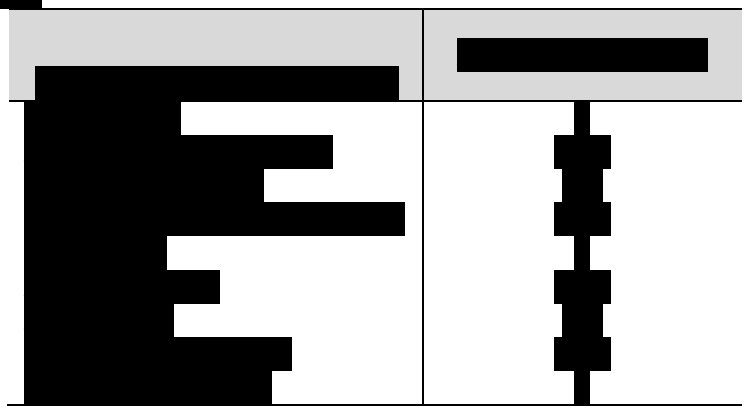




## Section 1.04 Annex 3. Calculation of adjustment for seasonal fuel use



[redacted]



[redacted]

## Annex 4. List of Port-au-Prince urban agglomeration communes included in the study

[redacted]

## Document information

| *Version* | *Date* | *Description* |
|---|---|---|
| 03.0 | 25 June 2014 | Revisions to:<br>• Include the Attachment: Instructions for filling out the programme design document form for small-scale CDM programme of activities (these instructions supersede the "Guideline: Completing the programme design document form for small-scale CDM programme of activities" (Version 03.0));<br>• Include provisions related to standardized baselines;<br>• Add contact information on a responsible person(s)/ entity(ies) for the application of the methodology (ies) to the PoA in B.4 and Appendix 1;<br>• Add general instructions on post-registration changes in paragraphs 2 and 3 of general instructions and **Error! Reference source not found.**;<br>• Change the reference number from *F-CDM-SSC-PoA-DD* to *CDM-SSC-PoA-DD-FORM*;<br>• Editorial improvement. |
| 02.0 | 13 March 2012 | EB 66, Annex 13<br>Revision required to ensure consistency with the "Guidelines for completing the programme design document form for small-scale CDM programmes of activities". |
| 01.0 | 27 July 2007 | EB33, Annex43<br>Initial adoption. |

Decision Class: Regulatory
Document Type: Form
Business Function: Registration
Keywords: programme of activities, project design document, SSC project activities