

Proposed Changes submitted by RemTec International

The following changes are submitted with the hope of clarification of the Protocol for all concerned and to eliminate needless time by the verifiers especially as it pertains to RCRA facilities and CEMS data. Pertinent data will be required to be supplemented with each Certificate of Destruction rather than having a verifier (perhaps months later) trying to go back to a destruction facility and ask for historical records from the period that the destruction took place. This will save cost and time for all parties concerned. For a RCRA facility, the CEMS data may pertain to many simultaneous destruction projects and therefore all CEMS data may not be relevant to the destruction of ODS.

For the same reasoning, verifying all TEAP Guidelines (that were developed from RCRA procedures) may take untold hours at a RCRA facility so it should be accepted that if the RCRA facility is operating within its Permit limits and Comprehensive Performance Testing approved by the governing authority, it should not be necessary for the verifier to audit these facilities other than a site visit to be familiar with the destruction of ODS process.

Thank you,

Tim Kearney

Reference Documents	Data Description	Suggested Changes
	<p>5 Quantifying GHG Emission Reductions – See Worksheet</p> <p>GHG emission reductions from an ODS project are quantified by comparing actual project emissions to baseline emissions. Baseline emissions are an estimate of the GHG emissions from sources within the GHG Assessment Boundary (see Section 4) that would have occurred in the absence of the ODS destruction project. Project emissions are actual GHG emissions that occur at sources within the GHG Assessment Boundary. Project emissions must be subtracted from the baseline</p>	<p>IMPORTS: Please calculate the 10 year period variable in a Table 5.1 like is done on the domestic table 5.1</p> <p>I would also recommend that a sample calculation be made for each protocol equation using a set of example parameters. This will also clarify the Protocol Calculations for project developers and verifiers.</p>
	<p>6.4 ODS Composition and Quantity Analysis Requirements</p>	
	<p>Prior to destruction, the precise mass and composition of ODS to be destroyed must be determined. The following analysis must be</p>	

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	<p>conducted: Mass shall be determined by individually measuring each container of ODS when it is full before destruction and after it has been emptied and the contents have been fully purged and destroyed. The mass of ODS and any contaminants is equal to the difference between the full and empty weight, as measured. The following requirements must be met for the measurement of each container:</p> <ol style="list-style-type: none"> 1. A single scale must be used for generating both the full and empty weight tickets. 2. The scale used must be properly calibrated per the facility's RCRA permit, or calibrated at least quarterly for non-RCRA facilities 3. The full weight must be measured no more than 48 hours prior to commencement of the destruction process 4. The empty weight must be measured no more than 48 hours after the conclusion of the destruction process <p>Composition and concentration of ODS and contaminants shall be established for each individual container by taking a sample from each container of ODS and having it analyzed for composition and concentration at an Air-Conditioning, Heating and Refrigeration Institute (AHRI) certified laboratory using the AHRI 700-200621 standard, or its successor.</p> <p>The following requirements must be met for each sample:</p> <ol style="list-style-type: none"> 1. A sample must be taken while ODS is in the possession of the final destruction facility 2. Sample must be taken by a technician unaffiliated with the project developer. (For instances where the project developer is the destruction facility itself, an outside technician must be employed for sample taking.) 3. Samples shall be taken with a clean, vacuum sealed stainless steel double ended bottle with minimum capacity of one pound and pressure of 600 PSI 4. Each sample must be taken in liquid state 5. A minimum sample size of one pound must be drawn for each sample 6. Each sample must be individually labeled and tracked according to the container from which it was taken, and record: <ol style="list-style-type: none"> i. Time and date of sample ii. Name of project developer iii. Name of person pulling sample iv. Employer of person pulling sample v. Volume of container from which sample was extracted vi. Ambient air temperature at time of sampling 	<ol style="list-style-type: none"> 1. A single scale must be used for generating both the full and empty weight tickets at the destruction facility. 3. The full weight must be measured no more than 48 hours prior to commencement of the destruction process

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	<p>7. Chain of custody for each sample shall be documented by a bill of lading</p> <p>All project samples shall be analyzed using ARI 700-2006 or its successor to confirm the mass % and identity of each component of the sample. The analysis shall provide:</p> <ol style="list-style-type: none"> 1. Identification of the refrigerant 2. Purity (%) of the ODS mixture by weight using gas chromatography 3. Moisture level in parts per million. The moisture content of each sample must be less than 90% of the saturation point for the ODS taking into account the temperature recorded at the time the sample was taken at the destruction facility. 4. High boiling residue, which must be less than 10% by mass 5. Other refrigerants in the case of mixtures of ODS and their percentage by mass <p>If the container holds non-mixed ODS (defined as greater than 99% composition of a single ODS species) no further information or sampling is required to determine the mass and composition of the ODS.</p> <p>If the container holds mixed ODS, which is defined as less than 99% composition of a single ODS species, the project developer must meet additional requirements as provided in Section 6.4.1.</p>	
	<p>6.4.1 Analysis of Mixed ODS</p>	
	<p>In addition to the requirements of Section 6.5.1, mixed ODS must also be processed and measured for composition and concentration according to the requirements of this section. The sampling required under this section may be conducted at the final destruction facility or prior to delivery to the destruction facility. However, the circulation and sampling activities must be conducted by a third-party (i.e. not the project developer) organization, and by individuals who have been properly trained for the functions they perform. The mass balance of each container shall be determined using the results of the analysis of this section. The results of the composition analysis in Section 6.4 shall be used to confirm that the destroyed ODS was in fact the same ODS that is sampled under these requirements.</p> <p>The ODS mixture must be circulated in a container which meets the following criteria:</p> <ol style="list-style-type: none"> 1. The container has no interior obstructions 2. The container was in a vacuum state prior to filling 	<p>sampling activities must be conducted or witnessed by a third-party (i.e. not</p> <p>The container was in a vacuum state prior to filling</p>

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	<p>3. The container has valves at both ends 4. The container must have a sampling port both at the bottom and top. 5. The container and associated equipment can circulate the mixture via a closed loop system both from the bottom to top and end to end. If the original mixed ODS container does not meet these requirements, the mixed ODS must be transferred into a temporary holding tank or container which meets all of the above criteria. The weight of the contents placed into the temporary container shall be recorded. Once the mixed ODS is in a container or temporary storage unit which meets the criteria above, circulation of mixed ODS must be conducted as follows:</p> <ol style="list-style-type: none"> 1. Liquid mixture shall be circulated from the bottom port to the vapor top port. 2. The mixture shall be circulated from the port on one end of the container to the port on the opposite end. 3. Simultaneously, a mass of the mixture equal to two times the mass in the container shall be circulated both vertically and horizontally. 4. Mixing shall occur over a period greater than two hours, but no more than eight hours. 5. Start and end times shall be recorded <p>Within 30 minutes of the completion of circulation, a minimum of two samples shall be taken from the bottom liquid port according to the procedures in Section 6.5.1. Both samples shall be analyzed at an AHRI approved laboratory per the requirements of Section 6.5.1. The mass composition and concentration of the mixed ODS shall be equal to the minimum GWP-weighted concentration of the two samples. If a temporary holding tank was used, after drawing the sample, the holding tank shall be emptied back into the original container for transport to the destruction location.</p>	
	<h3>6.5 Destruction Facility Requirements</h3>	
6.5	<p>Destruction of ODS must occur at a facility that meets all of the guidelines provided by the TEAP Task Force on Destruction Technologies. (see Appendix C for a summary of destruction facility requirements).</p> <p>This may include any RCRA-permitted hazardous waste combustor, as well as any other facility which meets the requirements of Appendix C.</p>	<p>Destruction of ODS must occur at a RCRA facility or at a facility that meets all of the guidelines provided by the TEAP Task Force on Destruction Technologies. (see Appendix C for a summary of destruction facility requirements).</p> <p>This may include any RCRA-permitted hazardous waste combustor, as well as any other facility which meets the requirements of Appendix C. At the time of destruction, all destruction facilities must have a valid Title V air permit, if applicable, and any other air or water permits required to</p>

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	<p>At the time of destruction, all destruction facilities must have a valid Title V air permit, and any other air or water permits required to destroy ODS.</p> <p>Facilities must document compliance with all monitoring and operational requirements dictated by these permits, including emission limits, calibration schedules, and personnel training.</p> <p>Facilities must further document operation consistent with the TEAP requirements, as defined in this section and Appendix C.</p> <p>Operating parameters of the destruction unit while destroying ODS material shall be monitored and recorded as described in the Code of Good Housekeeping approved by the Montreal Protocol. This data shall be used in the verification process to demonstrate that during the destruction process, the destruction unit was operating similarly to the period in which the DRE was calculated.</p> <p>The DRE is determined by using the Comprehensive Performance Test (CPT) as a proxy for DRE and is disclosed to the public in the destruction facility's Title V operating permit.</p> <p>To monitor that the destruction facility operates in accordance with applicable regulations and within the parameters recorded during DRE testing, the following parameters must be tracked continuously during the entire ODS destruction process:</p> <ul style="list-style-type: none"> <input type="checkbox"/> The ODS feed rate <input type="checkbox"/> The amount and type of consumables used in the process <input type="checkbox"/> The amount of electricity and amount and type of fuel consumed by the destruction unit <input type="checkbox"/> Operating temperature and pressure of the destruction unit <input type="checkbox"/> Effluent discharges measured in terms of water and pH levels 	<p>destroy ODS.</p> <p>RCRA facilities must document and attest to compliance with all monitoring and operational requirements dictated by these permits, including emission limits,</p> <p>Non-RCRA facilities must further document and attest that operations of the facility were consistent with the TEAP requirements, as defined in this section and Appendix C at the time of destruction.</p> <p>For RCRA facilities, the DRE is determined by using the Comprehensive Performance Test (CPT) as a proxy for DRE and is disclosed to the public in the destruction facility's Title V operating permit.</p> <ul style="list-style-type: none"> <input type="checkbox"/> The amount and type of consumables used in the process <input type="checkbox"/> The amount of electricity and amount and type of fuel consumed by the destruction unit Effluent discharges measured in terms of water and pH levels <input type="checkbox"/> Full CEMS data on the operation of the destruction unit, including

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	<p><input type="checkbox"/> Full CEMS data on the operation of the destruction unit, including temperature, pressure, fuel inputs, and emissions of criteria pollutants</p> <p>The project developer must keep records of all these parameters for the verification process.</p> <p>Project developers shall provide a valid Certificate of Destruction for all ODS destroyed.</p> <p>The Certificate of Destruction shall include:</p> <ul style="list-style-type: none"> <input type="checkbox"/> Serial, tracking, or ID Number of all containers for which ODS destruction occurred <input type="checkbox"/> Owner of destroyed ODS <input type="checkbox"/> Weight of material destroyed from each container <input type="checkbox"/> Date/time when destruction commenced <input type="checkbox"/> Date/time when destruction concluded 	<p>temperature, pressure, fuel inputs, and emissions of criteria pollutants</p> <p>Carbon monoxide (CO) is generally released from incinerators resulting from incomplete combustion and may be released from some ODS destruction facilities because it is one form by which the carbon content of the ODS can exit the process. Carbon monoxide is a good measure of how well the destruction process is being controlled. For the purposes of screening technologies, the following criterion has been established:</p> <ul style="list-style-type: none"> <input type="checkbox"/> a maximum CO concentration in the stack gas of 100 mg/Nm³. <p>Add these from Section 6.1</p> <ul style="list-style-type: none"> <input type="checkbox"/> Project developer <input type="checkbox"/> Generator EPA ID Number <input type="checkbox"/> Container ID Numbers <input type="checkbox"/> Hazardous Waste Manifest Numbers or Non-RCRA Destruction ID Numbers <input type="checkbox"/> Start destruction date <input type="checkbox"/> Ending destruction date <p>Owner of destroyed ODS</p> <ul style="list-style-type: none"> <input type="checkbox"/> Date/time when destruction commenced <input type="checkbox"/> Date/time when destruction concluded <p>Add: Destruction facility shall provide additional/supplemental information to the Certificate of Destruction provides Average CO emissions during destruction process expressed in PPM rolling average. Average Feed Rate during destruction process expressed in Kg/hr.</p>

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		<p>Average operating temperatures during destruction. Attestation that during the destruction period, destruction of ODS operations were within its operating permits and conditions as at time of calculation of DRE on similar material.</p>
	<p>Appendix C EPA Rules Governing ODS Destruction</p>	
	<p>This project type requires that all ODS be destroyed at a destruction facility that is compliant with both the international standards specified in the TEAP Report of the task force on destruction technologies³⁴ and Code of Good Housekeeping, as well as the requirements of domestic U.S. law. This appendix provides a brief summary of the rules dictated by domestic law for destruction of ODS, and the criteria that must be met for a destruction facility to qualify under this protocol.</p> <p>All ODS destruction is regulated under stratospheric ozone protection regulations under the CAA (40 CFR 82). Additionally, because some ODS are classified as hazardous wastes (such as CFC 113, methyl chloroform, and carbon tetrachloride), facilities that handle these ODS are regulated under Resource Conservation and Recovery Act (RCRA). Hazardous waste combustors (HWCs, e.g. incinerators) that destroy ODS classified as hazardous waste are also regulated by the Maximum Achievable Control Technology (MACT) standard under the CAA. Under the authority of the CAA, the stratospheric ozone protection regulations (40 CFR Part 82, Subpart A) require that ODS be destroyed using one of the destruction technologies approved by the Montreal Protocol Parties which are:</p> <ol style="list-style-type: none"> 1. Liquid injection incineration; 2. Reactor cracking; 3. Gaseous/fume oxidation; 4. Rotary kiln incineration; 5. Cement kiln; 6. Radio frequency plasma; or 7. Municipal waste incinerators (only for the destruction of foams). 	<p>Add Argon Arc Plasma (See Table 1 of <u>Destruction of Ozone Depleting Substances in the United States</u> Page 5</p>