SUMMARY OF COMMENTS & RESPONSES ON THE
DRAFT OZONE DEPLETING SUBSTANCES PROJECT PROTOCOLS
January 21, 2010

18 sets of comments were received during the public comment period for the Draft Ozone Depleting Substances (ODS) Project Protocols, Versions 1.0. In order keep this summary document to a reasonable size, some comments were edited for length, and similar comments were combined. Referenced sections refer to the U.S. Protocol unless stated otherwise; most edits to language were suggested for both protocols even if referenced under a section from the U.S. Protocol.

The comment letters can be viewed in their entirety on Reserve's website at http://www.climateactionreserve.org/how/protocols/in-progress/ozone-depleting-substances-project-protocol/.

Comments received by:

1. California Air Resources Board (CARB)
2. Clean Harbors Environmental Services, Inc. (CH)
3. Climate Wedge Ltd. Oy (CW)
4. Coolgas Inc. (Coolgas)
5. Energy Changes Projektentwicklung GmbH (Energy Changes)
6. EOS Climate (EOS)
7. EPA Stratospheric Protection Division (EPA SPD)
8. Fox & Earth Industries AG (F&E)
9. GTZ-Proklima (Proklima)
10. Hudson Technologies (Hudson)
11. ICF International (ICF)
12. RAL Quality Assurance Association for the Demanufacture of Refrigeration Equipment (RAL)
13. RemTec International (RemTec)
14. Safe Disposal Systems, Inc. (SDS)
15. SENS International (SENS)
16. United Nations Environment Programme (UNEP), Regional Office for Asia and the Pacific (UNEP)
17. Ventless Combustion & Energy Corporation (VC&E)
18. Veolia ES Technical Solutions, LLC (Veolia)

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General Comments

1. The equations appear to be unnecessarily confusing and the symbology is inconsistent. For many of the equations, there are mandatory values. Perhaps the symbol is included so that it can be revised easier in future versions of the protocol but at least the value could be inserted into the definition and a simplified version presented to minimize math errors. **(CARB)**

RESPONSE: Noted. Wherever possible, the equations have been simplified.

2. The assumption that refrigerant would otherwise be recycled (challenged by some) needs to be better justified. There could be significant implications of another baseline scenario. **(CARB)**

RESPONSE: Noted. Additional language has been added to clarify that there are several possible fates for refrigerant ODS. The baseline scenario of recovery and sale to the refrigerant and air conditioning market has been selected as a conservative baseline scenario.

3. It would be very helpful to have a figure (building on Figure D.1) describing a "typical" project and the various intermediaries/their roles to understand process from cradle-to-grave including where when certificate is issued, how double counting is prevented, etc (at present, tracking the process from the text is a bit challenging and still leaves a number of questions). **(CARB)**

RESPONSE: Noted. The Reserve will work to develop a figure illustrating the potential parties involved in an ODS project for the Reserve website and other communications materials.

4. **Imported**: Regarding the eligibility criteria on your draft, we have yet noticed much to our regret that you only take ODS into consideration which are destroyed inside the US and its territories. In our opinion, this does not comply with the idea that GHG emissions and reductions are worldwide phenomena and cannot be narrowed down. In this context the protocol should allow destruction of ODS in other countries.

In many countries export of seized ODS stock would take a long process of approvals, and hence there is a significant chance of leakage of ODS leading to increased emissions. Also in various low income countries, stock of ODS is very small making shipping costs very high and hence non-viability of destruction in the U.S. **(SENS, UNEP)**

RESPONSE: Noted. In the current protocol the Reserve has limited destruction to within the U.S. and its territories. This requirement ensures that facilities are regulated and monitored by the U.S. EPA and other regulators. Absent external oversight, project verifiers would be unable to ensure that the requirements of this protocol are met. To this end, the Reserve is working closely with the UNEP and others to explore options for certification of destruction facilities in Article 5 countries.

5. We are concerned that some of the conservative assumptions—which we certainly appreciate for credibility purposes—mean that deductions from the total amount of ODS destroyed are so significant that project developers will not be able to recoup costs, particularly in the foams sector. Our preliminary calculations of sample projects [please see the ICF public comment submission for more detail] show deductions as high as nearly 70-80% for building foam projects. This means that even for a low-cost building foam recovery project, credits would have to far exceed \$100/tCO_2e under the Reserve to turn a profit, an unlikely scenario.

We strongly urge the Reserve to consider the applicability of its protocols in a real, project-based setting before finalizing assumptions. **(ICF)**

RESPONSE: Noted. The Reserve is sensitive to the cost and feasibility issues associated with undertaking projects. To this end, the Reserve has sought to streamline quantification, monitoring, and verification procedures as much as possible while retaining sufficient accuracy. Where accurate estimates of GHG reductions are not possible – or where obtaining accurate estimates would be prohibitively costly or impose significant data collection, verification, and oversight burdens – the Reserve errs by being conservative, i.e., adopting assumptions that will tend to underestimate total net GHG reductions associated with a project. Conservative assumptions are necessary to ensure that CRTs issued by the Reserve are able to function effectively as CO_2 offsets and do not undermine overall GHG emission reduction goals. The use of conservative assumptions may mean that certain project activities will not be cost-effective given current market prices for CRTs, and these activities will therefore fail to be incentivized. However, relaxing quantification assumptions cannot be done based on cost considerations alone. The Reserve will continue to review specific proposals for adopting different assumptions or calculation methods where doing so will not adversely affect the environmental integrity of the GHG reductions the Reserve certifies.

6. In general we would like to see CAR allow early actors some leniency when requesting Variances in situations where Triangulation of other data points can help to support and document anything that the project developer was not able to predict would have been requested in a future CAR protocol. **(Coolgas)**

RESPONSE: Noted. The Reserve will entertain variance requests for early actors.

7. We strongly recommend the inclusion of transformation as the alternative to destruction by any method. The 1990 Revised Clean Air Act (CAA) of the United States defined transformation as being the alternative to destruction. I believe that the Protocols should do the same. Transform means to use and entirely consume (except for trace quantities) a controlled substance in the manufacture of other chemicals for commercial purposes. Transformation recycles the materials used to produce ODS, especially fluorine and chlorine.

The Protocol mentions transformation in Appendix C: *Destruction Efficiency (DE) is a measure of how completely a particular technology destroys a contaminant of interest – in this case the transformation of ODS material into non-ODS byproducts.* However, the wording that followed this sentence focused on the by-products being *destruction* by-products instead of useful products required in the CAA and the Final Rule for transformation processes.

The Protocols should read "*transformation and destruction*" throughout in order to make transformation processes eligible. [Please see the VC&E public comment submission for more detail.] **(VC&E)**

RESPONSE: Noted. The Reserve has added language that transformation is an acceptable form of destruction under the U.S. and Imports ODS Protocols. All transformation technology must meet all of the requirements provided for destruction technologies.

2 The Greenhouse Gas Reduction Project

2.1 Background

2.2 Project Definition

8. The project should be defined as any "INVESTMENT" in a set of activities for recovery and subsequent destruction of ODS (such as but not limited to recycling facilities for cooling/freezing appliances). [Please see the Energy Changes public comment submission for more detail.] **(Energy Changes)**

RESPONSE: Noted. The project start date must be defined in respect to a discrete, verifiable event. However, objectively determining a specific date of investment in a project activity would be problematic and will often be distinct from the actual commencement of ODS destruction. For the purposes of determining eligibility and accounting for GHG reductions, the project start date must be defined as the commencement of ODS destruction. The project definition must delineate a set of activities that result in real GHG reductions; investment alone does not result in real GHG reductions, and therefore cannot be used to define a project.

9. The third sentence of the fourth paragraph should be revised to include the underlined: "*Non-RCRA permitted facilities cannot receive and destroy ODS materials that are classified as hazardous waste, and must demonstrate compliance the Title VI requirements of the CAA for destruction of ODS…*" **(EOS)**

RESPONSE: Noted. This language has been added for clarification, though these facilities are already legally precluded from destroying hazardous waste.

10. As written, the last sentence could be construed as requiring the entire quantities of ODS destroyed to be documented on a single Certificate of Destruction, which is not the intent. We would simply recommend changing the wording of the last sentence to read as follows: "*However, all quantities of eligible ODS destroyed must be documented on a Certificate of Destruction issued by a qualifying destruction facility.*" **(Hudson)**

RESPONSE: Noted. The language has been clarified accordingly.

11. **Imported**: We note the import protocol has many ways of delineating a single project. We suggest that CAR might consider further delineation a project by limiting it to "one import" for a single project developer … at a single qualifying destruction facility. This would have the advantage of linking up with the focus of EPA regulations that monitor the individual import of a quantity of ODS. The destruction of a single import may occur over a longer timeframe and require one or more Certificates of Destruction, but would simplify the regulatory control and oversight to the single importation. **(EPA SPD)**

RESPONSE: Noted. The Reserve recognizes the added complexity associated with verifying a project composed of multiple imports. During the workgroup process, the balance between complexity of verification and its associated administrative burdens and transaction costs was discussed at length. While the verification of multiple imports under a single project will increase the complexity and costs of a single project verification, it was determined that on balance this level of complexity is acceptable, and is offset by the minimized overall verification and transaction costs.

12. **Imported**: A project is defined as destruction of "eligible imported ODS at a single destruction facility over a 12-month period". We suggest that CAR provide flexibility for combining individual destruction activities that include both imported and "domestic" ODS under a single project. There may be cases where a project developer will have both imported and "domestic" ODS destroyed at a given facility over a 12-month period, and the imported quantities may be significantly smaller than the domestic (or vice versa). The separate materials would not be physically aggregated, and the monitoring and verification would be kept separate. However, allowing flexibility to combine separate import and domestic projects would eliminate potentially significant delays and transactional costs that would otherwise jeopardize the viability of projects. **(EOS)**

RESPONSE: Noted. The Reserve has added an option to conduct Joint Verification of import and domestic ODS projects. The projects will still be classified and registered separately, but joint verification will provide many of the cost and administrative savings associated with combining into a single project.

2.2.1 ODS Sources

13. **Imported**: We believe CAR may want to reconsider the definition of "eligible sources" to prevent abuse and eliminate any incentive for mis-labeling to gain economic benefits. In particular, we are uncomfortable with providing any economic incentive for the destruction of virgin ODS that can be legally sold to meet remaining demand anywhere in the world. Developing countries will have considerable demand for at least the next 5 years to service existing equipment. In addition, the U.S. ODS protocol does not include as an "eligible source" quantities of "virgin saleable stockpiles." We believe for virgin ODS the two protocols should be equivalent and not include virgin ODS in the definition of "eligible sources" and instead focus on quantities of ODS recovered from refrigerant applications. **(EPA SPD)**

RESPONSE: Noted. The U.S. ODS protocol may be used for any ODS material, including virgin ODS sourced from the U.S., if it is available. The distinction between virgin saleable stockpiles and other materials made in the imported ODS protocol exists to differentiate between three baseline scenarios depending on whether the ODS comes from a government stockpile of seized materials, materials recovered from equipment at end-of-life, or stocks of saleable virgin ODS. In the U.S., a single baseline scenario is applicable to both recovered and virgin ODS.

The Reserve appreciates the risk of abuse that could occur in Article 5 countries through illegal production of new virgin ODS at existing swing plants. It is virtually impossible to distinguish between virgin ODS produced before or after the mandated ODS phase-out on January 1, 2010. As a result, it is possible that illegal material could be mis-labeled as produced or imported prior to the phase-out for the purpose of destruction under the Protocol. Even if a national inventory of legally produced/imported and saleable virgin ODS were in place that could be used as a reference point for Protocol verifiers in the country of origin, it is conceivable that an organization may attempt to sell its share of legal virgin ODS to the refrigeration market without reporting it to the inventory and then replacing this ODS with a similar amount of illegal material for use under the Protocol. It would be difficult for verifiers to catch such fraud, because it is hard to tell the difference between two batches of virgin ODS. Meanwhile, the complete phase-out of ODS production in Article 5 countries only just entered into effect on January 1, 2010 and, as a result, uncertainty remains whether the Montreal Protocol institutions in these

countries are sufficient to prevent and detect such fraud. Most likely, the opportunities for abuse are small. However, because of the remaining risks regarding the potential for mis-labeling, the Reserve has modified the Protocol to restrict inclusion of legal and saleable virgin ODS to that which is already being planned by project developers and can be imported to the U.S. by mid-2010. The goal is to avoid incentivizing swing plants to start producing new virgin ODS after the adoption of the Protocol when there will be a new market for the destruction of virgin material. Specifically, saleable virgin ODS will only be eligible for credit in situations where the project developer has submitted a voluntary pre-import notification to the U.S. E.P.A. no later than 60 days from the effective date of this Protocol and provided U.S. import documents to the U.S. EPA prior to June 30, 2010. This timeline would enable project developers to import existing stocks of legally produced virgin ODS while ensuring that swing plants in Article 5 countries will not have sufficient time and incentive to begin new production of illegal materials.

14. **Imported**: The import protocol seems to indicate that liquid ODS recovered from foams would not be eligible given phrases in Section 2.2.1. However, Section 2.2.2 uses the phrase "used in refrigerant applications," which might be interpreted to include liquid ODS recovered from the foam in refrigeration appliances. We do not know how a project developer or verifier would be able to determine if the CFCs recovered were only from the refrigeration portion of equipment, and did not come from the foam. Therefore, we suggest CAR encourage collection of all the ODS from pieces of equipment (from both the refrigerant and the foam) when possible, which might be done through the use of the phrase "liquid ODS recovered from refrigeration applications." **(EPA SPD)**

RESPONSE: Noted. The language has been modified to clarify that concentrated ODS recovered from foams is not eligible under this protocol.

2.3 Eligible ODS

15. The CAR ODS vs.1 protocol restricts the eligible ODS to four CFCs and one HCFC, and to refrigerants and intact foam. All eligible ODS appear in a highly distributed and diverse number of small quantities. The CAR ODS project boundary requires a compromise between accuracy and cost. However, the boundary proposed seems to be in favor of commercial interests of fluorocarbon producers. **(Proklima)**

RESPONSE: Noted. The chosen project boundary was selected based on the sources of ODS for which the Reserve was able to develop a Performance Standard, eligibility criteria, and standardized emissions estimate calculations. The Reserve considered all sources, sinks, and reservoirs (SSR) that could be affected by an ODS project. All relevant SSRs identified are included in the project boundary, and no significant SSRs have been omitted. The Reserve does not believe that accuracy has been sacrificed for cost in the current protocol..

2.3.1 Refrigerant Sources

16. We suggest modifying the first sentence in this paragraph to acknowledge the potential that the source gas could have also been illegally vented into the atmosphere in addition to being recycled for recharge of exiting equipment. On the other hand we do understand that there is no documentation which would have supported using venting in the development of the default leak rates for the individual ODS baseline calculations. We applaud CAR for taking the conservative

approach to developing the "Baseline Emissions from Refrigerant Recovery and Resale" in section 5.1. **(Coolgas)**

RESPONSE: Noted. The language has been modified.

17. We disagree with the proposed decision that "ODS extracted from a foam source for use in refrigeration equipment is not considered part of (the refrigerant) source category." In the U.S., there are facilities that separate ODS blowing agent, specifically CFC-11, from insulation foam. Those facilities are able to sell the CFC-11 to refrigerant reclaimers for its reuse in older refrigeration and air conditioning equipment.

Because of the significant reductions the draft Protocol would impose on foam destruction projects, the proposed decision noted above would have two outcomes: 1) Facilities will continue to separate CFC-11 from insulation foam but rather than pay for its destruction, they would sell the CFC-11 to meet demand to service older refrigeration and air conditioning equipment. 2) Facilities that are planning to deploy systems to separate ODS blowing agents from foam will abandon that technology, and simply continue the normal practice of shredding and landfilling foam.

Both of these outcomes will increase GHG emissions that could otherwise be prevented, discourage implementation of innovative technologies, and would represent an unfortunate, perverse consequence of the CAR Protocol. **(EOS, CW)**

RESPONSE: Noted. The Reserve acknowledges that there are a few existing operations that extract blowing agent and sell it as refrigerant. However, this baseline is inappropriate for future operations built to recover ODS for GHG credits. If the majority of extraction facilities are likely to be built only to service the carbon market, then the appropriate baseline is shredding and landfilling, not sale of extracted ODS as refrigerant.

18. Delete the bulleted list of CFCs and replace with the following language, in order to be in line with the VCS Standard.

ODS controlled by the Montreal Protocol for which the IPCC publishes a Global Warming Potential (100-year time horizon):

1) Annex A, Group I
2) Annex B, Group I
3) Annex C, Group I **(RAL)**

RESPONSE: Noted. Some of the ODS indicated have not been phased out of production either in the U.S. or in Article 5 countries. As such, destruction of these materials could result in additional production that would negate the benefit of ODS destruction. Alternately, some of these materials could be manufactured for the purpose of generating credits, another activity that would undermine any climate change benefit. Because of these possible perverse outcomes for ODS still in production, only ODS phased out of production are included in the Reserve ODS protocols.

2.3.2 Foam Sources

19. Suggest dropping reference to "liquid form" as some ODS would be in gaseous form or at equilibrium between a gas and liquid phase; could use "concentrated form" instead. **(CARB, EOS)**

RESPONSE: Agreed. The language has been modified.

20. This section is trying to dictate foam extraction methods. European "Fridge Plants" have to meet the WEEE directive of 90% recovery. Why does the Reserve need to dictate on the method? Typical plants shred under vacuum but extract under pressure. The section isn't clear. It would seem setting a performance standard and certify the plant as the WEEE does would be a better approach. Example "ODS extraction methods must meet 90% efficiency rating as verified by a third party testing". **(SDS, Proklima)**

RESPONSE: Noted. The methodology on demonstrating ODS blowing agent recovery efficiency has been re-worked to provide a methodology based on the WEEE standard, but using project-specific parameters.

21. We disagree with the idea that the baseline scenario for foam is separated into its own category and a significant 65% discount applied in the proposed "shredding and landfill" baseline. For Greenfield projects this would mean that there will be little financial incentive to include systems that separate ODS blowing agents into the overall project design. As a result, direct landfilling (in some developing countries) or shredding and landfilling foam would continue as usual. In our opinion the suggested foam baseline would also create a precarious precedence for emerging ODS destruction projects internationally. **(CW, EPA SPD)**

RESPONSE: Noted. However, the "discount" represents a conservative estimate of the emissions that would have occurred had the ODS blowing agent not been destroyed. The Reserve will continue to review this issue and the science as it evolves.

22. By explicitly prescribing only two specific ways of how foam blowing agents can be recovered and destroyed, you inhibit the implementation of advanced and new technologies such as on-site CFC destruction solutions. The latter allow for an adequate determination of gas types and gas mass flows when calculating actual emission reductions, provide less sources for process and handling leakage, and can also be more cost-effective solutions compared to the traditional cryogenic or carbon filter based recovery technologies. **(F&E)**

RESPONSE: Noted. The protocol has been modified to provide greater flexibility in the precise process used for ODS blowing agent recovery and destruction.

23. Change language to "*a project may either extract eligible ODS blowing agent from <u>intact</u> foams <u>or foams contained in equipment and appliances</u> and destroy the extracted blowing agent…*" **(RAL)**

RESPONSE: Noted. The option to destroy intact foams from appliances and equipment has been removed from the protocol. Accordingly, this comment is no longer applicable.

24. Change language to: "*This source category consists of ODS entrained <u>in foams from waste refrigeration appliances and equipment, construction materials and other ODS-containing products</u> that would have been released at end of life.*" **(RAL)**

RESPONSE: Noted. The option to destroy intact foams from appliances and equipment has

been removed from the protocol. Accordingly, this comment is no longer applicable.

25. HCFC-22 and HCFC-142b should be added to the eligible blowing agents. Use of HCFC-142b for foam applications was banned in the U.S. as of 2008; production of HCFC-142b for any other use will end in the U.S. on January 1, 2010. Similarly, production of HCFC-22 for any application, other than for servicing existing equipment (i.e., refrigeration and air conditioning, not foam manufacture) will end in the U.S. on January 1, 2010. **(EOS)**

RESPONSE: Noted. HCFC-22 has been added as an eligible ODS blowing agent. However, the Reserve was not able to obtain data on the baseline emissions from HCFC-142b. If the Reserve is able to obtain data on the baseline emissions of HCFC-142b, it may be added in a future protocol revision.

26. We would like a more precise definition of the term "container". Is there a size limit? A pressure limit? (Etc.) It is also necessary to establish whether the containers are to be incinerated together with their contents. **(RAL, SDS)**

RESPONSE: Noted. A definition has been added to the glossary.

27. It should be obvious that manual disassembly of appliances (i.e. manual stripping of foams) will not result in *intact* foam. **(RAL)**

RESPONSE: Noted.

28. Delete the sentence: "*Foam extracted from equipment and appliances must be categorized and stored in containers according to the type of ODS and the year the equipment or appliance was manufactured.*" This requirement is not realizable. [See the RAL public comment submission for more detail.] **(RAL)**

RESPONSE: Noted. These requirements have been relaxed in recognition of real-world limitations.

3 Eligibility Rules

3.1 Location

29. **Imported**: While we understand and acknowledge the basis for limiting the import of ODS to Article 5 countries only, we would welcome a dialogue on what grounds ODS from projects in non Article 5 could be included in the CAR protocol. In particular, former Soviet states fall outside the Article and have limited national policies and restrictions on ODS and very limited domestic destruction capacity. Perhaps an extension of the eligibility criteria to specific requirements on domestic action, legal framework, ODS recycling markets and availability of destruction facilities could provide access to a limited number of ODS projects from non Article 5 countries. **(CW)**

RESPONSE: Noted. The Reserve will explore this issue further for possible inclusion in future versions of the protocols.

3.2 Project Start Date

30. Questionable rationale for start dates that go back as far as 24-months prior to effective date of protocol. For example, it would seem that certain opportunities for verification may no longer be available if the project has been completed. It seems to make more sense to just allow projects from the effective date forward. **(CARB)**

RESPONSE: Noted. The start date policy, however, is a program-wide policy of the Reserve. The policy is aimed recognizing early actors; if data necessary for verification are not available, then a project will not be able to register regardless of start date.

31. This second sentence seems to suggest that projects started 24 months prior to the effective date of the protocol are eligible if submitted within the first twelve months, which is not the intent. We would suggest simply stating that projects with start dates between February 7, 2008 and the effective date must be submitted within 12 months of the effective date (on or before February 7, 2011). **(Hudson)**

RESPONSE: Noted.

32. 3rd sentence of the 1st paragraph: The use of the words "recycling market" appears to be incorrect. Suggest replacing it with the words "air conditioning and refrigeration market". **(Hudson)**

RESPONSE: Agreed. The language has been modified accordingly.

33. **Imported**: We support the project start date for imported ODS projects being the day that Destruction commences as this is consistent with the project start date for the Domestic protocol and will help with the standardization of the Reserve's tracking system.

We also strongly support the Reserve's policy on allowing early actors to register projects which were completed prior to the issuance of the Protocol for up to 12 months for any project which has a start date of February 7, 2008 or later. **(Coolgas)**

RESPONSE: Noted.

34. **Imported**: For clarification purposes we suggest changing the 3rd paragraph to read as follows: "*Only ODS refrigerants phased out of production in the country of origin before the export date are eligible to generate reductions under this protocol. For projects with export dates prior to the Montreal Protocol mandated phase-out of January 1, 2010, a letter from the Ozone Secretariat shall be required to confirm that early phase-out occurred*."

The definition of project start date is the date that destruction commences. There could be several months of time between when the ODS is exported from the source country and when destruction commences. Changing this will clarify that production had ended in the source country before the ODS was exported. **(Coolgas)**

RESPONSE: Agreed. This language has been modified.

3.3 Project Crediting Period

35. Will the start date of within 6 months of project submission cause any problems? The crediting period is for 12 months and project developers may not know the total destroyed until the end of the 12 month period. **(CARB)**

RESPONSE: Projects only need to be submitted within six months of their start date, not completely registered. In any case, it is standard for offset projects to be submitted and registered prior to determining the actual GHG reductions achieved; we do not anticipate any problems resulting from this start date policy.

36. We strongly support that CRT's will be issued for all ODS emissions avoided by a project over 10 years at the time the project is verified, due to the fact that all future emissions of the destroyed ODS will be permanently avoided at the time of destruction. **(Coolgas)**

RESPONSE: Noted.

37. The project crediting period is 10 years (but it should refer to 10 years from the date of INVESTMENT, e.g. 10 years from construction of recycling facility etc.). [Please see the Energy Changes public comment submission for more detail.] **(Energy Changes)**

RESPONSE: Please see response to Comment #8.

38. The 10-year release window chosen for the gas releases in the baseline seems rather arbitrary and might therefore attract criticism because the calculation is certainly not conservative and consistent. It might be recommendable and more appropriate, dependent on the project type, to define an approach where (the same amount of credits) is issued but on a different (fixed and predefined) time scale according to the actual release of CFCs in the baseline that would have occurred, for example, through leakage in existing equipment. This would still provide a substantial amount of credits in order to provide adequate funding for the ODS destruction activities in the US. **(F&E)**

RESPONSE: Noted. This issue was discussed at length in the ODS working group, and current year crediting for a finite 10-year period was determined to be the most appropriate method. There is significant evidence that 100% of destroyed ODS would be released in the baseline over an extended time horizon. The ten-year window selected corresponds to the crediting period used throughout the Reserve program, and indicates the horizon over which a baseline could reasonably be estimated and characterized. Limiting the horizon to ten years is conservative in nature, as it results in fewer total GHG reduction credits than would accrue over an extended horizon. The issue of current year versus year-on-year crediting was also discussed during the workgroup process at great lengths. Both crediting schemes result in the same amount of credits, but year-on-year crediting was determined to provide an insufficient payback to incentivize ODS projects. Current year crediting for a ten-year crediting period was selected as an appropriate balance of conservative accounting and financial viability, and does not significantly alter the protocol's environmental effectiveness.

3.4 Additionality

3.4.1 The Legal Requirement Test

39. The language does not recognize that ODS destruction may be recognized as an offset under a federal and or state cap-and-trade program. **(CARB)**

RESPONSE: Noted. The Reserve is aware that many if not all of the project types for which it has developed protocols may be recognized under a federal and/or state cap-and-trade program. The Reserve requires legal attestations to ensure that projects are not double-registered with other offset programs, including possible state and federal regulatory offset programs. Please refer to the Program Manual for issues related to the Reserve program generally.

40. **Imported**: For imported ODS projects with respect to the source country the legal requirement test should only have to be met up to the date of export from the source country to the United States for destruction of the ODS. This will avoid a project developer from regulatory uncertainty due to regulatory changes after the date of export and before the before it is destroyed. [See the Coolgas public comment submission for an example.] **(Coolgas)**

RESPONSE: Agreed. This language has been modified.

41. The legal requirement test should be handled similarly as under the Clean Development Mechanism (source: http://cdmrulebook.org/85). [Please see the Energy Changes public comment submission for more detail on CDM treatment of national and/or sectoral policies or regulations.] **(Energy Changes)**

RESPONSE: Noted. The Reserve's legal requirement test is functionally similar, if not identical, to the CDM's. The CDM allows project developers to ignore certain legal requirements enacted after November 11, 2001 in order to avoid creating a perverse incentive that would dissuade developing countries from enacting progressive GHG mitigation policies. While there is a strong rationale for such a rule with respect to energy sector policies, it is not clear – given the nature of the ODS market, the limited enforceability of ODS destruction requirements, and the relatively short-term nature of ODS destruction as a global climate change mitigation option – that such a rationale applies to ODS regulations. Furthermore, adopting the same policies as the CDM – in particular the November 11, 2001 cutoff date – would be arbitrary in the context of ODS, which are not covered by the Kyoto Protocol.

42. We suggest further clarification around the statement that "Any project which seeks HFC allowances under this program (should the [American Clean Energy and Security Act] legislation become law), or under any other current or future regulations or regulatory programs, will be ineligible according to this protocol."

We understand that CRTs could not be issued for a project where ODS destruction is being used to generate HFC allowances. However, it is possible that future climate legislation or regulatory programs would recognize ODS destruction as an eligible GHG offset. In that event, we would hope that the relevant regulatory agency(ies) would have the discretion to adopt the CAR protocol(s) as appropriate. **(EOS)**

RESPONSE: Noted. The Reserve has recently updated its Attestation of Title documents

required for each project verification. The concerns addressed in the language cited have now been addressed in the revised Attestation of Title. Accordingly, this language has been removed from the protocol.

43. In order to avoid confusion, we suggest replacing the word "legislation" with "the American Clean Energy and Security Act". **(Hudson)**

RESPONSE: Noted. This language has been removed from the protocol.

3.4.2 Performance Standard Test

44. The description of the performance standard test is confusing. It should clearly state that this means the projects are above and beyond business-as-usual practices. **(CARB)**

RESPONSE: Noted. The language has been clarified.

45. The performance standard shows that not much ODS is destroyed in a year but there is no support that business-as-usual is refrigerant recycling vs. illegal venting. **(CARB)**

RESPONSE: Noted. Additional language has been added to clarify that there are several possible fates for refrigerant ODS. The baseline scenario of recovery and sale to the refrigerant and air conditioning market has been selected as a conservative baseline scenario

3.5 Regulatory Compliance

46. Rotary kiln incinerators undergo upset conditions periodically. This happens when there is a malfunction in the incineration system and CO_2 emissions exceed levels established in their operating permit. While infrequent these conditions will occur during normal operations and have the possibility of occurring during the destruction of an ODS project.

Please consider the application of the phrase *"all destruction facilities must meet the full burden of applicable regulatory requirements during the time ODS destruction occurs"*. In some instances there could be an exceedance of a regulatory requirement but the amount of CO_2 emitted is measurable and could be deducted from the project emissions. The amount of the emission reduction from the project should be outlined in the protocol. [Please see the Clean Harbors public comment submission for more detail.] **(CH)**

RESPONSE: Agreed. This language has been clarified.

47. **Imported**: Definition of Significant and Non-significant Non-compliance with examples would help in avoiding any conflict with verifiers during verifications. **(UNEP)**

RESPONSE: Noted. Clarification has been added.

4 GHG Assessment Boundary

48. SSR 2 and SSR 3 should be included within the GHG Assessment Boundary. Stimulation of a high recovery rate. Otherwise high ODS emissions from the recovery and collection of ODS-containing waste is very likely. [See the RAL public comment submission for more detail.] **(RAL)**

RESPONSE: Noted. These SSRs have not been included in the Project Boundary because the recovery of ODS would occur in both the project and baseline scenario. Therefore, the net emissions from these SSRs are assumed to be zero.

49. CAR ODS does not address project emissions from foam blowing agents (neither in the September nor the November versions) and thus the foam blowing related HCFC and HFC emissions from source SSR 6 (Figure 4.1) are not accounted for (new appliances and new foam put to the usage that CFC provided). This reduces the project emissions accounted for and avoids incentive for replacing HCFC-141b as blowing agent as already done in most countries. In the CAR Imported ODS protocol this applies to source SSR 4 (Figure 4.1). [See the Proklima public comment submission for more detail.] **(Proklima)**

RESPONSE: Noted. The production of new foam is outside of the defined project boundary as it is not affected by the destruction of foam blowing agent in the project or baseline scenario. Whether the end-of-life foam was sent to a landfill or incinerated, or the ODS blowing agent is destroyed, the quantity of foam produced in the future will not be affected. Accordingly, emissions from this process are excluded from the project boundary.

5 GHG Reductions Calculation Method

50. Equations throughout document – Consistently use either *blowing ODS* or *blowing agent ODS*. **(CARB)**

RESPONSE: Noted. The language has been modified for consistency.

51. Many of the inputs (e.g., average annual weighted emissions, 10-year cumulative emissions) relay on numbers that suggest a precision that is greater than the data supports. I suggest rounding down to the nearest whole percent which still may be greater than the inputs support, but more defensible. **(CARB)**

RESPONSE: Noted. The values have been rounded accordingly.

52. The current CAR protocol is overly conservative on the emissions losses for foam projects; these projects are so heavily discounted that these will not generate sufficient revenue for project developers to undertake these projects. If this remains the case, then this is a losing proposition for the environment since CAR's protocol will not offer the needed incentive to recover and destroy the largest banks of ODS in the US. **(EPA SPD)**

RESPONSE: Please see response to Comment #5.

5.1 Quantifying Baseline Emissions

53. Landfill assumptions: the assumptions for release and degradation in landfills do not account for climatic variations but may be the most accurate available and are conservative. The equations do not account for the fact that CFC-11 (and maybe others) degrade into HFCs,

whose degradation fate within the landfill is unclear. Additionally, a landfill gas system may actually mean that the gases are pulled out of the landfill before they have a chance to degrade. Since the engines and flares may not be hot enough to destroy the ODS, there may be more ODS emissions at systems with LFGTE or flares (this issue requires further clarification). **(CARB, Proklima)**

RESPONSE: Noted. The accounting requirements of the protocol are conservative in order to address the uncertainty around these issues.

54. The ability to use standardized values for refrigerant projects (which is not proposed for foam projects) seems to be at odds with the fact that the volume of refrigerant is much more uncertain than the ODS contained in the blowing agent. Also, Refrigerants are assumed to be reclaimed and sold for secondary use (although most of these would remain in use in old equipment) whereas ODS from foam is assumed to be disposed of, although it can also be separated and re-sold.

Generally we believe that similar approaches for both issues should be applied for both foam and refrigerant, and strongly advocate empowering project developers with the ability to demonstrate leak rates and retiring of equipment to choose their approach more independently. [Also see the EOS and Proklima public comment submissiosn for more detail.] **(CW, EOS, Proklima)**

RESPONSE: Noted. The standardized values used for refrigerants relate to the emissions rate at which a known quantity of ODS refrigerant would be released over a ten-year period; the quantity of refrigerant destroyed must be empirically measured prior to destruction. Standardized values for ODS foam blowing agents, on the other hand, would be used as a proxy to determine how much ODS is destroyed in the project. The standardized ODS blowing agent emissions from shredding and landfilling are analogous to the standardized refrigerant emission rates provided.

55. We support the 10 year cumulative emissions (%) in Table 5.1 for refrigerants. **(Coolgas)**

RESPONSE: Noted.

56. As regards conservativeness, I would like to raise your attention to the fact that you have chosen the highest GWP values ever published for the ODS. In the same IPCC report you use as a reference, there are lower values stated for the CFCs in a different chapter and in order to be conservative, it would be recommendable to use the (still very high but) lower values, for example, 10,600 for CFC-12 and 4’600 for CFC-11. **(F&E)**

RESPONSE: Noted. The lower GWP values cited in this comment appear in the IPCC Third Assessment Report. The values used in the Reserve protocols are taken from the more recent IPCC Fourth Assessment Report and represent the most recently published figures.

57. **Imported**: Please calculate the 10 year period variable in a Table 5.1 like is done on the domestic Table 5.1.

Clarification is needed that the applicable emission rates are annual rates that would be used to calculate 10-year cumulative emissions for the baseline scenarios (as in Equation 5.3).

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. **(RemTec, EOS)**

RESPONSE: Noted. Calculation of 10 year cumulative emissions and clarifications have been added.

58. **Imported**: (Table 5.2) Protocol ideally should cover other ODS as well. In many countries other ODS quantities were seized, which if not taken for destruction will leak in due course of time leading to GHG emissions increase. Hence protocol may be revised to include these gases as well (under specific conditions so that perverse incentive of additional production could be avoided). **(UNEP)**

RESPONSE: Noted. The Reserve will explore the possibility of adding seized ODS other than CFCs to future protocol revisions.

59. **Imported**: (Equation 5.2) It is not clear how Q_end and Q_seizure shall be monitored. It is imperative to avoid any foul play during the years of seizure before start of destruction process. **(UNEP)**

RESPONSE: Noted. These values must be demonstrated according to site records, which will vary significantly from one project to the next. Accordingly, the Reserve cannot dictate a single record on which to derive these values.

5.1.1 Baseline Emissions from Refrigerant Recovery and Resale

60. The protocol defines the baseline scenario for ODS refrigerants as “recovery and resale of ODS into the secondary market to recharge existing equipment.”

This certainly applies to equipment at the end-of-life (or at least should be under federal requirements). However, the baseline scenario for projects where ODS is recovered from operating equipment is continued use of that ODS in that equipment. There are tens of thousands of functional refrigeration and air conditioning systems in the U.S. that continue to leak and continue to be “topped off”. Under the protocol’s baseline scenario, a project that provides an incentive for the early retirement of such systems are likely not realizing the full GHG reduction credit. **(EOS)**

RESPONSE: Noted. The appropriate baseline scenario for calculation of GHG offset credits was discussed at length in the workgroup. The group arrived at the conclusion that a conservative assumption of recovery and resale is appropriate for this project protocol. Additional benefits associated with early retirement may be candidates for a separate, but complementary and compatible, project protocol.

61. **Imported**: The ODS Workgroup assumes that without a CAR protocol, all CFC in Article 5 countries would be emitted and thus any amount of imported CFC being destroyed in the US would be additional. Such an assumption is likely to reinforce itself and ignores that Article 5 countries have refrigerant recovery and recycling capacity (not only from the Montreal Protocol’s MLF). For example in Brazil, the MLF paid for CFC recovery equipment and four companies across the country operate that equipment under the obligation to pay a fixed price for refrigerants delivered to them. Refrigerants from domestic refrigerators from UNFCCC CDM

projects in Brazil have been treated there and the substances are being re-used. CAR could include such practices for its ODS protocol and use the information about the "Refrigerant Management Plans" in CAR project monitoring. The refrigerant baseline scenarios in Table 5.1 in the Imported ODS Project Protocol ignore the Montreal Protocol. [See the Proklima public comment submission for more detail.] **(Proklima)**

RESPONSE: Noted. The Reserve acknowledges and appreciates the significant work that has been done through the Montreal Protocol, the Multilateral Fund, and others to increase the recovery and management of ODS in Article 5 countries. The language in the protocol has been modified to make clear that significant efforts have been made in this area. Nonetheless, recovery and recycling capacity is not common practice in any Article 5 countries, and therefore collection and destruction exceeds the specified Performance Standard as described in Appendix A.

62. **Imported**: The Workgroup's judgment that recycling in A5 countries will remain inexistent suggests an intention to expand the CFC emission reduction credits available to US industry. The data cited [refrigerant and foam recycling data in Proklima's public comment document 2] is not publicly available, however, Proklima asserts that it is known to the Workgroup and that such parameters are achieved for many years by firms represented in the Workgroup. Current A5 recycling and future investments in demanufacturing are concealed to exclude foam in the Imported ODS Protocol baseline. [See the Proklima public comment submission for more detail.] **(Proklima)**

RESPONSE: Noted. The Reserve intends to periodically review the assumptions underlying the Performance Standard for the ODS Imports Protocol. If recycling in Article 5 countries does become common practice, then this change will be reflected in future versions of the protocol. As such, it is not the Reserve's intention to make any long-term prediction or assumption about the recycling of ODS in Article 5 countries.

5.1.2 Baseline Emissions from Shredding and/or Landfilling Foam Blowing Agents

63. Equation 5.4 – Since $BE_{treat,i}$ is always 0.19 for building insulation and 0.43 for insulating foam, can you simplify by just providing those as defaults. You could provide these equations and the simplified versions with the calculations done since they rely almost entirely on provided data except for the quantity of foam blowing ODS destroyed. It can become a much simpler equation of amount * default with a default table for the default by agent and type of foam. **(CARB)**

RESPONSE: Agreed. The equations have been modified accordingly.

64. Table 5.2 – In our understanding the factors used in the table: "percent of remaining foam blowing agent released during anaerobic conditions" and the "percent of released foam blowing agent degraded in anaerobic landfill conditions" are derived from tests with foam samples in laboratory conditions. From a developer's perspective, we would strongly welcome a view from the Protocol on the accuracy of such laboratory calculations vis a vis real landfills. In our view the reliance on such figures (given the significant impact on project's financial eligibility) should be scientifically undisputed. **(CW, EOS)**

RESPONSE: Noted. The Reserve recognizes the considerable uncertainty associated with

these values. In light of this uncertainty and the fact that there is no scientifically undisputed data regarding the fate of foams in landfills, the Reserve has no choice but to adopt conservative assumptions. The conservative assumptions included in the protocol risk under-crediting projects, but do not risk undermining the credibility of the credits generated.

65. The "percent of remaining foam blowing agent released during anaerobic conditions" (Column C) and the "percent of released foam blowing agent degraded in anaerobic landfill conditions" in Column D, appear to have typographical errors.

The corresponding values from Scheutz et al. (2007) would be:

	Release Rate (Column C)	Degradation Rate (Column D)
CFC-12	52%	60%
HCFC-141b	41%	48%

RESPONSE: Noted. The typographical errors have been corrected.

66. The authors of the studies cited for foam release and degradation rates explicitly stated that their calculations do not represent actual field conditions in real-world landfills. We believe that reliance on these data to quantify GHG emission reductions is not appropriate, and ignores a large degree of uncertainty in the underlying studies. [See the EOS and Proklima public comment submissions for more detail.] **(EOS, Proklima)**

RESPONSE: Noted. The Reserve has contacted authors involved in these studies for guidance, and as noted in the response to Comment #64, has no choice but to calculate emission reductions conservatively in the face of uncertainty.

67. Table 5.2 should be continuously updated to ensure that it reflects current knowledge. **(RAL)**

RESPONSE: Noted.

68. The protocol currently provides no guidance how {Qfoam,I = Total quantity of foam blowing ODS i destroyed} shall be calculated when ODS is entrained in foam. There should be a clear procedure to ensure that there are no biased/flawed samples (so the samples are really representing the underlying population) and the confidence level and interval also have to be determined (e.g. such as confidence level 95% interval +/- 0.1 gODS/kg foam, etc.). **(Energy Changes)**

RESPONSE: Noted. The option to destroy intact foams from appliances and equipment has been removed from the protocol. Accordingly, this comment is no longer applicable.

69. **Imported**: Appliances in car shredders, landfilling of foam, reuse of foam, and foam as fuel substitute occurs in some Article 5 countries. CAR's sole focus on current practices in the US excludes other practices in Article 5 countries that could be expanded or reduced when accounted for. **(Proklima)**

RESPONSE: Noted. The destruction of ODS blowing agent from Article 5 countries is not eligible to generate credits under the Article 5 protocol. The Reserve agrees that it is inappropriate to assume a U.S. baseline for the treatment of ODS blowing agents in Article 5 countries. During the protocol development process the Reserve researched typical end-of-life

treatment options for foam in Article 5 countries and consulted with representatives from various agencies. However, because the treatment of foam varies significantly from country to country, the Reserve was not able to establish a consistent, standardized baseline to calculate baseline emissions from ODS foam blowing agents in Article 5 countries. Due to the lack of a consistent baseline, destruction of ODS blowing agents is not an eligible project activity under the Reserve's Article 5 ODS protocol. The Reserve regrets that the protocol is unable to incentivize better management of ODS foam blowing agent banks in Article 5 countries, but will continue to pursue this issue for future protocol versions.

5.2 Project Emissions

70. Equation 5.5 – The notations used are inconsistent. Why use Foam but not Refrigerant? **(CARB)**

RESPONSE: Noted. The Reserve has standardized the notation where possible.

71. Equation 5.5 – We support the project emissions equation. **(Coolgas)**

RESPONSE: Noted.

5.2.1 Project Emissions from the Use of Refrigerant Substitutes

72. We support the Refrigerant Substitute Emission Factors and applaud CAR for coming up with a standardized approach that will give project developers and verifiers clarity for determining substitute emission rates. **(Coolgas)**

RESPONSE: Noted.

73. The protocol states "The use of site specific substitute parameters (refrigerant, GWP, and leak rate) are not permitted". This position is presumably based on the belief that CAR could not review this information on a case-by-case basis and that there is no reliable way to demonstrate what the substitute emissions would be for a given project.

The EOS methodology does allow for project-specific data to be collected as a way to incentivize adoption of advanced technologies that have lower refrigerant charges, lower GWPs, and/or lower leak rates compared to "default" values. We would encourage CAR to allow for this flexibility, while putting the burden on project developers to fully document the basis for the improvements that would allow verifiers and CAR to routinely review the projects in a standardized format. Without this flexibility, the protocol is failing to provide incentives for additional and verifiable GHG reductions. **(EOS)**

RESPONSE: Noted. Use of site-specific parameters is prohibited because it would require a subjective, case-by-case determination of the parameters' applicability. Specifically, project developers would need to demonstrate that a system upgrade or replacement would not have occurred in the absence of carbon market incentives, and CAR verifiers and program staff would be required to evaluate the veracity of such a demonstration. As experience with other offset programs suggests, conducting these kinds of evaluations on a case-by-case basis – even where a "standardized format" for them is available – would be cumbersome, subjective,

and difficult to undertake in a consistent and fair manner. The Reserve has opted for standardized approaches to offset crediting expressly to avoid the transaction costs and administrative burdens associated with project-specific evaluations, even where this may result in under-crediting for some individual projects. .

74. Add a new section between 5.2.1 and 5.2.2 like the following:

Project Emissions from the Recovery and Collection of ODS

Projects that recover ODS from equipment or appliances must account for the emissions of ODS that occur during recovery. Recovery must be conducted in a manner that achieves at least a 90% recovery and destruction efficiency (RDE) (as determined by the methodologies in the RAL GZ-728 standard).

[See the RAL public comment submission for more detail.] **(RAL)**

RESPONSE: Noted. Although the RAL standard has not been used in the final protocol, a more robust methodology derived from the RAL standard has been incorporated to demonstrate RDE (referred to as RE in the protocol).

75. Averaging substitute refrigerant emissions for the substituted refrigerants leads to a preference for HFC refrigerants. If averaging refrigerants' GWP is acceptable or favored, then there is reason for averaging actual substitutes (as in the September version) and thereby improve the accuracy of the baseline.

Both by excluding substitute foam blowing agents and by averaging GWP for substituted refrigerants, the CAR ODS protocol contributes to an unnecessary continuation of fluorocarbon use and protects the US industry from efforts already implemented in other OECD countries. [See the Proklima public comment submission for more detail.] **(Proklima)**

RESPONSE: Noted. The Reserve protocol does not incentivize or require the use of any specific refrigerant substitute. Rather, the calculations provide a conservative accounting of project related emissions from substitutes. The protocols make a conservative assumption that all destroyed refrigerant ODS will be replaced with a non-CFC substitute. In many cases, such as the instance where the destroyed ODS would have been vented to the atmosphere during servicing, this assumption results in very conservative accounting and diminishes the overall GHG credits generated. Granting additional credits to incentivize the specific use of low or zero-GWP substitutes requires an independent assessment of the current practices, regulatory environment, and other eligibility concerns associated with the choice of refrigerant. As such, the use of low or zero-GWP substitutes is a potentially complementary and compatible project type to the ODS destruction covered in the current protocol, but would need to be addressed under a separate protocol.

Substitute emissions from destroyed foam blowing agents are not included within the project boundary because they are unaffected by the project activity. In the baseline scenario, the landfilling of foam and its ODS blowing agent does not meet a market need. Accordingly, the use of HFC and other blowing agents in the future is not increased or altered by the diversion of ODS blowing agent from landfill to destruction.

76. **Imported**: The conservative assumption that destroyed ODS refrigerants are replaced by HFC-134a appears to have been chosen because of a lack of data on market share of alternatives

across different end-uses. While this is a reasonable assumption for motor vehicle air conditioning, for other applications such as commercial refrigeration and commercial and residential air conditioning, other alternatives with lower GWPs including HCFC-22, HCFC-123, hydrocarbons, ammonia, and carbon dioxide are in wide use as documented in the 2006 Report of the Refrigeration, Air Conditioning, and Heat Pumps Technical Options Committee. In many countries, OECD and A5 ones, the market shares of non-GWP/ODP substances are increasing rapidly. Already several CDM methodologies expand these changes. The CAR ODS protocol vs.1 and the chosen baselines run counter to these changes. [See the EOS and Proklima public comment submissions for more detail.] **(EOS, Proklima)**

77.

RESPONSE: Noted. However, the literature available does not provide quantitative data sufficient to calculate the share of substitutes that would be HCFC-22 and HCFC-123. Accordingly, the Reserve has opted to make the conservative assumption that the substitute is HFC-134a.

78. **Imported**: (Equation 5.5) The assumption that HFC-134a leaks at the same rate as CFC refrigerants is not consistent with the data for U.S. equipment and with the available technical literature for developing countries. For example, Table 5-1 of the 2006 RTOC Report estimates that for Article 5 countries, refrigerant leak rates for industrial refrigeration were 24.2% for CFCs and 13.7% for HFCs. **(EOS)**

RESPONSE: Noted. This reference has now been incorporated.

79. Corporate Bias: The impact of CAR ODS vs.1 described so far would not be entirely clear without assessing this in light of the Waxman-Markey bill section 619 on Hydrofluorocarbons (HFCs):

To provide compliance flexibility, allowances may be banked and offsets may be created through the destruction of CFCs and halons, with credit equal to 80% of the carbon dioxide equivalency of the destroyed compound.

The phase-out schedule for HFCs stretches to 2038. This long period assures that HFCs use continues while these are already replaced in refrigerants and in foam blowing agents in most OECD countries. Importing ODS and offsetting per CO_2e the domestic use of HFC further reduces the minor relevance of this HFC phase-out schedule.

The production of HFCs is dominated by two large corporations in the US, which are represented in the CAR workgroup on ODS. It should be of concern to CAR that this level of corporate influence on offsetting rules invites “retaliatory” offsetting rules in future emissions trading systems. A race to the bottom between offsetting rules could appear. The quality of offsetting credits affects prices for these credits.

CAR ODS vs.1 protects these corporations by:
- avoiding the HFC replacement in other OECD countries
- avoiding non-HFC substitutes
- avoiding foam blowing substitutes
- excluding non-GWP/ODP substitutes from the baseline
- maximizing the import of ODS to the US
- minimizing demanufacturing capacity to appear in Article 5 countries

(Proklima)

RESPONSE: The Reserve has developed this protocol to serve the voluntary carbon offset market and has focused on adopting credible and conservative methods for determining net GHG reductions associated with ODS destruction. To ensure environmental integrity from a climate change perspective, the Reserve has deliberately adopted conservative assumptions regarding ODS substitute emissions. Subsequent Reserve protocols may address the use of low-GWP substitutes. Failing to provide incentives for use of low-GWP substitutes in the current protocol does not "protect" companies involved in HFC production. Whether ODS destruction is used in a U.S. regulatory system to offset HFC production emissions is up to U.S. lawmakers and regulators.

5.2.2 Project Emissions from Foam Separation

NOTE: The Reserve received numerous recommendations for language changes concerning destruction of intact appliance and equipment foams. We have reviewed those public comments but have not responded to them since we have removed destruction of intact foam from appliances and equipment as an eligible option.

The majority of comments related to project emissions from foam separation related to the difficulties associated with accurately calculating project emissions. The difficulties and inadequacies of the draft protocol contributed to the Reserve's decision to remove the destruction of ODS foam blowing agent in intact appliance foam from version 1.0 of the protocol.

80. Even within waste refrigeration appliances that contain only CFC R11 as the blowing agent, the range of values of blowing agent per unit weight of foam is so great that each appliance would need to be sampled and analysed individually if reliable figures on the ODS content are to be generated. A single foam sample will not be sufficiently representative.

The analytical method in section 6.5.3 comes up against limits when analysing original foam samples that have not been subjected to prior treatment to remove the ODS. Simply sampling foam samples from appliances is associated with an error of up to 49 %. It is a fact that when these samples are prepared, ODS can escape from the cut surfaces and are not then detected in the analysis. **(RAL)**

RESPONSE: Noted. Due to these and other uncertainties, the option for destroying intact appliance and equipment foam has been removed from version 1.0 of the U.S. protocol pending further research.

Encouraging manual disassembly or "filleting" and discouraging capture after shredding is inconsistent. The Oko-Institut e.V. [see the SDS public comment submission] has commented on interim results on their study of manual disassembly showing the practice to average a 41% loss due to non treatment of the doors (the current practice in the US) and the PUR not recovered. This is significantly higher than the 24% average stated by the Sheutz study for appliance shredding. **(SDS)**

RESPONSE: Noted. Due to these and other uncertainties, the option for destroying intact appliance and equipment foam has been removed from version 1.0 of the U.S. protocol pending further research.

81. Equation 5.7 – The protocol specifies that foam separation must be done in a manner that achieves at least a 90% recovery and destruction efficiency, but the equation assumes as a default that all projects will not exceed greater than 90% recovery and destruction efficiency. We believe that there are technologies and practices that can achieve significantly more than 90% recovery, and therefore the protocol should allow projects to demonstrate and document their recovery rates with empirical data. [See the EOS public comment submission for more detail.] **(EOS)**

RESPONSE: Agreed. The methodology for calculating recovery efficiency has been modified to be more robust and to allow for demonstration of a recovery efficiency greater than 90%.

5.2.3 Default Project Emissions from ODS Transportation and Destruction

82. Equation 5.8 – why is the notation different for TR and Dest from Equation 5.5? Why create De_{def}? You use DEST again in Equation 5.9. **(CARB)**

RESPONSE: Noted. The equations and terms have been cleaned up throughout the documents.

83. We strongly support the default project emission factors for ODS transportation and destruction facility emissions. However we would like to see clarification as to whether or not verifiers will be required to verify the "actual" emissions rate due to transportation and destruction in the event the project developer elects to use the default emissions factors. We would encourage CAR not to require this double verification as it would defeat the purpose of having the default option and unnecessarily drive verification costs. **(Coolgas)**

RESPONSE: Agreed. The language has been modified to clarify that in the instance that default emission factors are used, the project specific emissions need not be verified.

6 Project Monitoring and Operation

84. We note generally that the final protocol should move towards a reduced requirement on sampling and testing. In particular:

• The division of foams on the basis of vintage seems unnecessary, especially as there is little variation between appliances manufactured in different years.
• We suggest the requirement to analyze the content of blowing agent is removed from the protocol. Several studies, e.g. RAL Institute in Germany found that there is 85g of CFC-11 in every kg of foam. We suggest that the Protocol adopts a conservative default value for the mass ratio of ODS blowing agent in appliance foam. This would significantly streamline project development and reduce development costs. **(CW)**

RESPONSE: Noted. The option to destroy intact appliance and equipment foams has been removed from the protocol. Accordingly, this comment is no longer applicable.

6.1 Reserve ODS Tracking System

(Bulleted List) Recovered CFC refrigerants are typically not considered hazardous waste, and therefore the "generator" may not have an EPA identification number. We suggest requiring the EPA ID number or, if no EPA ID number exists, requiring the FEIN/TID number instead. Also, recovered CFC refrigerants may not require shipment via a Hazardous Waste Manifest. Therefore, we suggest changing the fourth bullet point to require "Hazardous Waste Manifest of Bill of Lading Numbers, or Non-RCRA Destruction ID Numbers". **(Hudson)**

RESPONSE: Noted. The inputs to the ODS Tracking System have been modified for simplicity and to be equally applicable to all potential parties.

6.2 Point of Origin Documentation Requirements

85. We strongly support the point of origin documentation for ODS destruction projects. We feel as this is a necessary step and will provide documentation which can be used for triangulation purposes in verifying what is destroyed. **(Coolgas, EOS)**

RESPONSE: Noted.

86. Grandfather all "Packaged" stockpiles which can be documented as being held in inventory for sale on or before the protocol approval date. This would have to be documented with inventory and purchase records proving that the stockpiled "Packaged" refrigerant was in stockpile form before the protocol approval date. [See the Coolgas public comment submission for more detail and reasoning for suggestion.] **(Coolgas)**

RESPONSE: Agreed. This provision has been added.

6.3 Custody and Ownership Documentation Requirements

87. **Imported**: Change "*bill of lading (where appropriate)*" to "*bills of lading (where appropriate)*" because there will be several bills of lading on an import project. **(Coolgas)**

RESPONSE: Agreed. The language has been modified accordingly.

6.4 Foam Collection and Management Requirements

NOTE: The Reserve received numerous recommendations for language changes concerning intact appliance foams. We have reviewed those public comments but have not responded to them since we have removed intact foam destruction as an eligible option.

A number of comments both at the public workshop and in written comments identified difficulties and shortcomings of the requirements proposed for the management of intact appliance foam. These comments contributed to the Reserve's decision to remove the destruction of ODS foam blowing agent in intact appliance foam from version 1.0 of the protocol

88. Change first sentence to: "*Appliances and equipment containing foam or foam that has been extracted from appliances and equipment…*". We reiterate here our fundamental doubts about the soundness and environmental sense of allowing foams to be manually extracted from appliances. **(RAL)**

RESPONSE: Noted. Due to these and other uncertainties, the option for destroying intact appliance foam has been removed from version 1.0 of the U.S. protocol pending further research.

89. Separate building foams and appliance foams as the blowing agents and recovery processes are different. **(SDS)**

RESPONSE: Agreed. The protocol has been modified accordingly.

90. We recommend adding the requirement to list number 1 that destruction of the foam or the ODS separated from the foam must be certified by a facility that meets the criteria established by the 2002 TEAP Task Force on Destruction Technologies. **(EOS)**

RESPONSE: Agreed. This is specified in Section 2.2 of the protocol.

91. List 1(a) – We recommend either not specifying what form the blowing agent needs to be extracted in, or require that the blowing agent be extracted in a "concentrated form". **(EOS)**

RESPONSE: Agreed. The language has been modified throughout the protocol to use the term "concentrated."

92. Add the following bullet point to the first bulleted list:
• *Quantity of extracted ODS, amount of PU, ferrous metal, non-ferrous metal, etc. recovered*
(RAL)

RESPONSE: Noted. However, this language has not been added as the information requested does not have any bearing on the GHG accounting for, or eligibility of, projects.

93. Add the following bullet point to the second bulleted list:
• *Foam weight*
(RAL)

RESPONSE: Noted. However, this language has not been added as the information requested does not have any bearing on the GHG accounting for, or eligibility of, projects. A requirement for calculating the weight of foam residual is now included in the methodology for calculating recovery efficiency, but this will only be conducted on a sample of appliances.

94. **Imported**: The foam collection and management requirements (chap. 6.4) are not used in the CAR Imported ODS Protocol. Therefore any imported ODS is accountable irrespective of the appliance treatment that produced it. This puts the CAR ODS protocol in conflict with the UN-FCCC CDM methodology AMS III.X because it erases the effect of the eligibility criterion in AMS III.X that requires applying the WEEE or any better demanufacturing standard.

Great care should be used to define the CAR Imported ODS Protocol so that it contributes to preventing poor recycling practices in Article 5 countries and gives incentives to establish demanufacturing capacity since transport costs for appliances are a mayor barrier to ODS

abatement. A protocol that does not assure that foam blowing agents are destroyed when crediting destroyed refrigerants prevents demanufacturing investments in the majority of Article 5 countries because project developers' costs for collecting refrigerants are very small compared to the cost of collecting blowing agents. By allowing import of ODS refrigerants without condition, CAR ODS vs.1 will severely damage recycling in Article 5 countries. [See the Proklima public comment submission for more detail.] **(Proklima)**

RESPONSE: Noted. The Reserve recognizes the potential benefits of destroying ODS blowing agent from processed appliances in Article 5 countries. However, requiring the treatment of ODS blowing agent from these appliances may have a potentially perverse impact on overall GHG reductions achieved. The cost of recovering and destroying refrigerant ODS is significantly lower than the cost of recovering and destroying ODS blowing agent. Therefore, the resources required to recover and destroy ODS blowing agent would be diverted from the more efficient recovery and destruction of ODS refrigerant. The net impact of such a requirement could likely be decreased overall emission reductions at an increased cost. The Reserve believes that its Article 5 protocol could be used in conjunction with the CDM methodology authored by GTZ-Proklima to complement the energy efficiency gains achieved through that methodology. Rather than place the Reserve protocol in conflict with the CDM methodology, the Reserve believes that the two protocols are compatible and complementary.

6.5 ODS Composition and Quantity Analysis Requirements

6.5.1 Refrigerants and ODS Extracted from Foam

95. There does not appear to be any requirement in the protocol for composition analysis prior to shipment to the destruction facility. We suggest that the protocol should be clarified and that it specify that each container of ODS should be sampled prior to shipment to the destruction facility utilizing the same sampling procedure. This will help confirm the destroyed ODS was in fact the same ODS that was sent to the destruction facility by the project developer.

In addition, to ensure the accuracy of the sample, the procedures for circulation of mixed refrigerants should be implemented at the project developer's storage site prior to sampling and shipment for destruction. In addition, the protocol could require that the sampling and circulation provisions in sections 6.5.1 and 6.5.2 take place at the material originator's location (rather than at the destruction facility) if the process is properly verified and the material then shipped to the destruction facility in a sealed and tagged container to prevent tampering and insure that it is the same product. The destruction facility would not need to arrange for further processing of the container's contents. **(Hudson)**

RESPONSE: Noted. Although there is no requirement in the protocols that the ODS will be tested for composition prior to arrival at the destruction facility, this sampling is common practice and a requirement of most destruction facilities. By sampling while in the possession of the company that will destroy the ODS, there is certainty that the destroyed material is what it is purported to be. The protocol provides flexibility in the choice of location for circulation for mixed refrigerants, and as suggested, this activity could take place prior to delivery to the company conducting destruction activities.

96. *"A sample must be taken while ODS is in possession of the final destruction facility."* Please change facility to "*company*" or the end of the sentence to "*in the possession of the company which will be managing and performing the destruction activity*" as there will be situations where samples are pulled under the management of the destruction company while the ODS is not physically located at the destruction facility. **(CH, Coolgas)**

RESPONSE: Agreed. The language has been modified accordingly.

97. *"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."* This language should be more general to include a sample bottle that meets the DOT specifications for the refrigerant sampled. For example, "*samples shall be taken with a clean, vacuumed container with a minimum capacity of one pound and that meets the DOT 39 requirements for shipping*." **(CH, Coolgas, SDS)**

RESPONSE: Agreed. The language has been modified accordingly.

98. The protocol refers to ARI700-2006 as the verification method for High Boiling Residue; this protocol is reported by volume not by mass; while the Reserve's protocol requires mass it is not typical for labs to report by mass. The Reserve protocol should clearly call out to except the ARI700 procedure to HBR as it's a volume procedure using volumetric apparatus. The protocol should state its own procedure for determining HBR for clarity and uniformity. **(SDS)**

RESPONSE: Noted. However, the Reserve has elected to rely on the ARI standard as it is the industry-accepted standard for analyzing the purity of ODS refrigerants. Conversion from volume to mass will be conducted by project developers and verified for accuracy by project verifiers.

99. *"Chain of custody for each sample shall be documented by a bill of lading."* "A bill of lading" should be changed to "A bill of lading or multiple bills of lading" in case multiple shippers are involved in shipping the sample. **(CH, Coolgas)**

RESPONSE: Agreed. The language has been modified accordingly.

100. Change "*chain of custody for each sample shall be documented by a bill of lading*" to "*chain of custody for each sample shall be documented by one of the following: paper bills of lading or electronic bills of lading that use package specific tracking numbers and electronic proof of deliveries*" because the most common way to ship samples is via Fed Ex or UPS with electronic signatures. [See the Coolgas public comment submission for more detail.] **(Coolgas)**

RESPONSE: Agreed. The language has been modified accordingly.

101. Add the underlined text: "*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 under the management of the destruction company*". [See the Coolgas public comment submission for more detail.] **(Coolgas)**

RESPONSE: Agreed. The language has been modified accordingly.

102. The requirement for the sample to be "less than "90% of the saturation point" in item 3 may not be effective for CFCs which have very low saturation points (e.g., at 40 degrees F, R12 is fully

saturated at 36ppm and R11 is fully saturated at 42ppm of moisture). In such cases, 90% saturation only provides a 3-4 ppm cushion. Temperature changes could dramatically alter the results of a moisture test and could, in certain circumstances, fail to identify a refrigerant that is fully saturated and has floating water inside the container. We suggest that the requirement be that the sample be less than 50% of the saturation point to insure that, regardless of the refrigerant, there is no possibility of floating water inside the container. **(Hudson)**

RESPONSE: Noted. The requirement has been modified to 75% of the saturation point. A concern was raised during consultation with workgroup members that a saturation point as low as 50% could provide insufficient cushion, could invalidate even relatively clean material, and would require unnecessary and costly treatment of ODS prior to destruction. As a compromise between these two concerns, a value of 75% has been selected.

103. Allow early actors to use temperature records from the National Oceanic and Atmospheric Administration (NOAA) to document the temperature at time of sampling in cases where the temperature was not recorded at time of sampling. The temperature record would have to be documented and from a temperature recording station within 5 miles of the sampling location.

Early actors would most likely not anticipate a requirement to record temperature at time of sampling since this is not something that is required by an ARI-700 laboratory in order to run an ARI sample. NOAA's National Weather Service division has monitoring stations all around the country which continuously record the temperature, these records can be used to validate the temperature at the time of sampling. **(Coolgas)**

RESPONSE: Agreed. The language has been modified accordingly.

104. (First numbered list) Add to number 1 as follows: "*A single scale must be used for generating both the full and empty weight tickets at the destruction facility*."

Delete number 3: "The full weight…" **(RemTec)**

RESPONSE: Noted. The language in bullet 1 has been modified.

105. (Second numbered list) Change number 6.v. to "*Volume and weight of liquid ODS from which sample was extracted*". The weight of the container is not of interest. What is important is the weight of the ODS. **(RAL)**

RESPONSE: Noted. The purpose of this requirement is for tracking of the sample to a single container. Accordingly, the volume of the container is an appropriate data point.

106. Change the sentence as follows: "*All project samples shall be analyzed using ARI 700-2006 or its successor or a similarly validated analysis method to confirm the mass % and identity of each component of the sample*." The suggested amendment is made here despite strong reservations. [See the RAL public comment submission for more detail.] **(RAL)**

RESPONSE: Noted. However, the Reserve has elected to rely on the ARI standard as it is the industry-accepted standard for analyzing the purity of ODS refrigerants. If there are specific methods that have been separately validated, please submit them to the Reserve for review and possible inclusion in future versions of the protocol.

107. (Third numbered list) In number 1, change “refrigerant” to “ODS”. **(RAL)**

RESPONSE: Agreed. The language has been modified accordingly.

108. Footnote #30 specifies where the project developer is the destruction facility itself, a 3rd party should take samples. We recommend that similarly, if the project developer is, or operates an ARI-certified laboratory, that a different ARI-certified lab not affiliated with the project developer must be employed to take and analyze the samples. **(EOS)**

RESPONSE: Agreed. The protocol has been modified accordingly.

6.5.2 Analysis of Mixed ODS

109. We feel that if the sampling and circulation is to take place either at the destruction facility or at some other location prior to the destruction, then this paragraph should be revised to make it clear that the sampling and circulation must be conducted after the ODS leaves the possession of the material originator (or the company holding it for the material originator).

Alternatively, the protocol could provide that the sampling and circulation take place at the material originator’s location if it is properly verified and the material then shipped to the destruction facility in a sealed and tagged container to prevent tampering and insure that it is the same product. The destruction facility would not need to arrange for further processing of the container’s contents. **(Hudson)**

RESPONSE: Agreed. The language has been modified to allow sampling at the project developer’s facility if activities are performed by a third-party.

110. (Second numbered list) The language is very detailed in this section and may place an unnecessary burden on verification. In order to not pigeon hole this mixing process I recommend the language broadened to “the ODS must be re-circulated for a period of at least 30 minutes prior to sampling to ensure the contents are thoroughly mixed.” Smaller containers (< 0.5 tons) should be exempt from the mixing procedure and larger containers that can document the absence of baffles should also be omitted from the procedure. [Please see the Clean Harbors and EOS public comment submissions for more detail.] **(CH, EOS)**

RESPONSE: Noted. The ODS mixing procedures have been modified in a number of ways that will simplify and streamline the process. In particular, a provision has been added that containers without baffles may be used. In addition, the Reserve will re-assess its mixed ODS requirements in the near future after gaining experience with project implementation.

111. The percentage of mixed ODS should be lowered from 99% to 90% to require mixing. There will be several cases were one ODS species would be over 90% of the mixture but less than 99%. In these cases there is very little benefit to subjecting the product to the circulation process. It is still unclear what mixing procedure is necessary. **(CH, CW, EOS, Coolgas, SDS)**

RESPONSE: Agreed. The value has been changed from 99% to 90%.

112. **Imported**: As noted for the domestic protocol, the definition of a “mixed” ODS as any material containing less than 99% of a single ODS will impose significant logistical and cost constraints

on projects, with little if any benefit in terms of accuracy. We recommend that mixed ODS be defined as less than 90% composition of a single ODS, and that only containers with internal obstructions be required to pump out and recirculate the ODS before sampling. **(EOS)**

RESPONSE: Agreed. The value has been changed from 99% to 90%.

113. A refrigerant mixture that is 99% pure will have no ability to stratify, and certainly could not stratify to the point of skewing the analysis. Any issue of stratification will only arise in cases of more highly mixed refrigerants where the stratification of one component (to the extent it can occur) could have a material effect on the analysis. Moreover, the benefit of mixing must be weighed against the risk of refrigerant losses during the process of transferring the refrigerant from one container to another, then back again after mixing. Every time that the refrigerant is moved (that is every hose connection) there is a risk of loss of some amount of the refrigerant, whether through accident, defective hoses or fittings, or human error. This additional procedure will also impose significant logistical and cost concerns, while providing little if any benefit in terms of accuracy. Therefore, this procedure should only be implemented where the possibility of stratification could materially affect the accuracy of he analysis. We submit that a threshold level of 80% is more than sufficient to ensure the accuracy of the analysis. In light of the foregoing, we strongly suggest that the 99% threshold level needs to be reduced to 80%, if not lower. **(Hudson)**

RESPONSE: Noted. Please see response to Comment #111.

The flow rate for the mixing is more important than the time – the higher the flow rate the greater the velocity and therefore the more effective the mixing. If the protocol requires that the mass of the mixture equal to two times the mass in the container, a requirement that we support, then the protocol should require use of a pump with a minimum flow rate of 30 gallons per minute, which equates to approximately 18,000 lbs. of refrigerant per hour (depending on the refrigerant). The time for circulation, therefore, will be based on the amount of the refrigerant being circulated. **(Hudson)**

RESPONSE: Noted. The requirements have been modified to require a minimum rate.

114. Add to the sentence: "*However, the circulation and sampling activities must be conducted or witnessed by a third-party (i.e. not the project developer) organization, and by individuals who have been properly trained for the functions they perform*." **(RemTec)**

RESPONSE: Noted. The protocol has been modified to allow a third party to conduct the circulation and sampling activities at the project developer's site.

115. (First numbered list) Delete number 2: "*The container was in a vacuum state prior to filling*." [Hudson] suggests instead adding a statement in the next paragraph to require that the "*mixed ODS must be transferred into a fully evacuated temporary holding tank or container…*" [See the Hudson public comment submission for more detail.] **(RemTec, Hudson)**

RESPONSE: Noted. The language has been modified to require that the container is fully evacuated, but not in a vacuum state.

116. (First numbered list) "*no interior obstructions*" How would a verifier obtain this information and how would it effect results? Baffles are safety items for transportation. **(SDS)**

RESPONSE: This requirement can be verified through a site visit and inspection of the container used for re-circulation.

117. The requirement that the container have valves "at both ends", and that it be capable of being circulated from "end to end" should be eliminated. While tanks typically have valves on the top and bottom (vapor and liquid ports), most tanks do not have valves on either end since there is no reason for such valves. Mixing the refrigerant from bottom to top (from the liquid port into the vapor port) should be more than sufficient to ensure proper mixing, and little, if any additional benefit would result from mixing end to end. To require end to end mixing would require costly retrofitting of existing tanks to cut into the tanks and create new ports with valves, or require custom made tanks at great expense. The additional cost of complying with the tank requirements and then complying with the end to end mixing requirements is wholly unnecessary and will provide little if any benefit. **(Hudson)**

RESPONSE: Agreed. The language has been modified accordingly.

118. The protocol should make it clear that when transferring the ODS to or from the shipping container and/or the mixing container, the container from which the ODS is being recovered should be recovered to at least the levels of vacuum required by EPA regulations (eg, 15"hg for R-12 and 29"hg for R-11). Because of the properties of refrigerant, as the liquid level within the container is reduced the vapor level will increase until all of the liquid has been removed and the vapor has filled the entire space. To ensure that most of the vapor is also transferred to the mixing container, and then ultimately back to the shipping container, the protocol should require that proper recovery and evacuation practices are followed. **(Hudson)**

RESPONSE: Agreed. The language has been modified to specify vacuum levels for recovery.

119. The presence of baffles or other internal obstructions should not automatically disqualify a shipping container from being used as the mixing container. Hudson's ISO containers are each fitted with a full flow spray bars connected to the top vapor port, consisting of a perforated pipe inside the container, which disperses the incoming liquid across essentially the entire length of the container. This type of fitting will work even in an ISO with baffles. The protocol should permit the use of containers that are fitted with such devices. **(Hudson)**

RESPONSE: Agreed. The language has been modified accordingly to allow interior structures that do not impede the flow of ODS.

120. (First numbered list) "*sampling ports both at the bottom and top*" Is the protocol suggesting that containers with ports that sample the vapor space of the container are not sufficient? The port must be physically located on the top? **(SDS)**

RESPONSE: Noted. The sampling and circulation requirements have been modified for clarity and simplicity.

6.5.3 Analysis Requirements for ODS Entrained in Foam

NOTE: The Reserve received numerous recommendations for language changes concerning procedures for destruction of intact foam from appliances and equipment. We have reviewed those public comments but have not responded to them since we have removed intact foam

destruction as an eligible option.

The comments received at the public workshop and in written form identified shortcomings of the draft protocol requirements and the limited samples required. These comments contributed to the Reserve's decision to remove the destruction of ODS foam blowing agent in intact appliance foam from version 1.0 of the protocol

121. The requirements contained in section 6.5.3 of the Draft Protocol concerning the sampling and analysis of foams are nowhere near adequate if the aim is to obtain reliable quantitative data on the actual amounts of ODS destroyed from foams that have been stripped manually from the waste appliances and then being subject of direct incineration.

Given the variety and difficulties in predicting the type and amount of insulating foam in waste refrigeration appliances and the blowing agents these foams contain (different ODS, HFCs, HCs and other non-ODS), it is not possible to generate any meaningful and generally applicable formula for the amount of ODS destroyed. In view of this huge uncertainty, the only reasonable response is to prohibit any direct incineration of ODS-containing foams from appliances and equipment.

We therefore continue to urge that the ODS in appliance foams must be recovered, liquefied and then destroyed. [See the RAL public comment submission for more detail.] **(RAL)**

Response: Noted. Due to these and other uncertainties, the option for destroying intact appliance foam has been removed from version 1.0 of the U.S. protocol pending further research.

122. By allowing foams to be directly incinerated leaves too many unverifiable quantities (see SDS technical comments) to label the protocol as a "high" standard. The short term additive benefits are undeniable but should not undermine the development of a foam processing industry in the United States. The Reserve should consider foam burning as an interim step to extraction.

We support foam burning short term but there is no scientific data that supports manual disassembly can achieve a 90% RDE when accounting for the doors and foam not extracted. The Reserve should consider focusing on what gets destroyed and not what's released in the process as any destruction of ODS foam is additive to the current practices of landfill. The market will dictate that companies manage the foam to preserve the ODS content. **(SDS)**

Response: Noted. Due to these and other uncertainties, the option for destroying intact appliance foam has been removed from version 1.0 of the U.S. protocol pending further research.

6.6 Destruction Facility Requirements

123. Various editorial changes regarding RCRA and non-RCRA facilities. **(RemTec)**

RESPONSE: Noted. Where possible, the suggested language has been incorporated.

124. Change "*Facilities must document compliance with all monitoring and operational requirements dictated by these permits, including emission limits, calibration schedules, and training*" to "*Facilities must document compliance with all monitoring and operational requirements*

associated with the destruction of ODS materials, as dictated by these permits, including emission limits, calibration schedules, and training, for the duration of the ODS destruction project."

Veolia is concerned that a verifier could interpret this statement to mean that the destruction facility could not have any formal or informal areas of non-compliance identified by the U.S. EPA or a State Regulatory Agency and that minor violations (e.g. an incorrectly labeled hazardous waste container, an inspection form not properly completed, etc.) not related to the destruction of ODS materials would be considered by the verifier to disqualify the project. **(Veolia)**

RESPONSE: Noted. The language has been modified to reference specifically the ODS destruction activities. However, the suggested language has not been used.

125. (First bulleted list) The Draft Protocol already includes default emission factors for fossil fuel and electricity use at the destruction facility, emissions from fossil fuels from transportation, ODS emissions from incomplete destruction of ODS, and CO_2 emissions from ODS oxidation during destruction. What is the purpose of these requirements if the default value is available to use? Please consider removing the consumable tracking and make the fuel and electricity consumption optional if you chose to use the default values. The verifier should not need to quantify emissions from actual electricity and fuel consumed during the destruction process if default emission rates are used. **(CH, Coolgas, RemTec, Veolia)**

RESPONSE: Noted. The language has been changed to require the tracking of these parameters only for projects where the default emission factor is not used.

126. (First bulleted list) *Operating temperature and pressure of the destruction unit* - The Veolia incinerators are required to monitor the operating temperatures at various points in the incinerator, but there are no requirements to document these temperatures. The facility is required to document the minimum exit temperatures for the kiln and secondary combustion chamber.

Effluent discharges measured in terms of water and pH levels – The discharges have minimal impact on the destruction of ODS materials and there are no regulatory requirements to monitor these discharges.

CEMS data - The permit requirements for the Veolia hazardous waste incinerators require the incinerators to monitor and document the emissions of carbon monoxide. Carbon monoxide serves as a surrogate indicator for the DREs that are established during the Comprehensive Performance Testing that must be conducted periodically at all hazardous waste incinerators. This forms the basis of compliance for the incinerator. The DREs are strictly enforced by State and Federal Regulators and the Title V permits which include a self reporting mechanism.

Veolia recommends that information in bullets 2-6 be removed from the protocol for a RCRA Part B permitted hazardous waste incinerator when the incinerator is operating in compliance with a Title V permit. The Certificate of Destruction could be modified to state that the ODS destruction was conducted in full compliance with all applicable facility permits and regulations. **(Veolia)**

RESPONSE: Noted. The protocols have been modified to require the measurement of carbon monoxide via CEMS. However, at present, the Reserve feels it is necessary to retain conservative and stringent monitoring requirements as it gains experience in the operations of

ODS destruction projects. As the Reserve learns more about real-world project implementation and risks, it will consider modifying and simplifying these procedures in future versions of the protocols.

127. (Second bulleted list) The last 2 bullets require the Date and Time when the destruction occurred on the Certificate of Destruction. The date is a reasonable request as it is an industry standard but the time is not. When destroying projects containing many containers (i.e. cylinders) tracking the exact time of destruction for each container is not important and places an unneeded burden on the destruction facility. Please consider removing the time requirement and just use the date. **(CH)**

RESPONSE: Agreed. The language has been modified accordingly.

7 Reporting Parameters

8 Verification Guidance

8.1 Standard of Verification

8.2 Monitoring Plan

8.3 Verifying Project Eligibility

128. (Table 8.1) How can verification adequately be performed for a project that was completed prior to the effective date of the protocol (same as previous comment)? **(CARB)**

RESPONSE: Verification activities are always conducted ex post, and rely on proper project documentation and monitoring data. Project verifiers must verify this information whether the project is performed prior to or after the protocol effective date.

8.4 Core Verification Activities

8.5 Verification Site Visit

129. (Table 8.2) Within an individual project, appliance foam extraction and separation may take place across 15 or more sites nationwide. The requirement that all foam extraction / separation sites be visited on a per-project basis will be cost and time prohibitive. We strongly recommend allowing the verifiers to determine the number of site visits where there are multiple facilities controlled by the same company, using the same technology, the same training procedures, etc. **(EOS)**

RESPONSE: Agreed. The protocol has been modified to allow verifiers to select an appropriate sample of facilities for site visits.

8.6 ODS Verification Items

130. Who is charged with assessing the rigor of a verifier's assessment as the treatment of the required elements could vastly vary in quality? **(CARB)**

RESPONSE: All verifiers are certified by the American National Standards Institute (ANSI) and trained by the Climate Action Reserve. All verification reports undergo review by Reserve staff prior to CRT issuance.

131. (Table 8.4) Change "*verify that all ODS samples were taken by a third-party at the destruction facility*" to "*verify that all ODS samples were taken by a third-party <u>while the ODS was in possession of the company which is managed and performed the destruction of the ODS</u>*." **(Coolgas)**

RESPONSE: Agreed. The language has been modified accordingly.

Appendix B Summary of Performance Standard Development

B.1 Destruction of ODS from Refrigerants and Foam

132. While we understand CAR's preference to use EPA's Vintaging Model (VM) to determine both the weighted emission rate for each CFC refrigerant and for the substitute refrigerant, in lieu of actual measurements which are not readily available, we are concerned that the current CAR protocol rigidly applies these values from the VM. The constant refinement of the VM by EPA may mean the version of the VM used in CAR's domestic protocol may be deviate in a matter of time which could undermine the solid foundation CAR is trying to establish.

To simplify the protocol and avoid mis-matches between the protocol and changes in the VM, an alternative approach might apply a weighted average emission rate as being applicable to all refrigerants. This approach would be consistent with EPA's use of the VM as a *predictive* tool, rather than as a very specific *prescriptive* tool. By generalizing the emission rate across all eligible refrigerants and substitutes we believe it would send a market signal that the destruction of all surplus CFCs in the short-term would have environmental benefit, and that there is some urgency to act in the short-term to get at all these potential stocks before they are emitted to the atmosphere. **(EPA SPD)**

RESPONSE: Noted. The Reserve has added language to the protocol to contextualize the use of the Vintaging Model data, and to be more explicit about its operation and inherent limitations. Additionally, values have been presented rounded to the nearest percent in order not to suggest an unattainable level of accuracy.

Appendix D Development of Refrigerant Emissions Rates

133. (Table D.4 and D.6) The HFC blends R-404a and R-410a are substitutes for R-22 but not for CFCs, and should therefore not be included in the calculation of replacement leak rates. **(EOS)**

RESPONSE: Noted. The Reserve has consulted again with industry experts and confirmed that R-404a and R-410a are used in the same applications as the CFCs being destroyed. These HFC blends are not "drop-in" replacements that can be used in equipment that once used CFCs, but rather require equipment upgrades. The baseline under this protocol is constructed in such a way that all substitutes used to perform the function once performed by the destroyed ODS must be considered, regardless of whether they are drop-in substitutes or whether they require a technology transition.

134. Appendix D calculates the average leakage and the average GWP of substitute refrigerants, again with commercial bias. Table 5.1 gives the results for leakage, Table 5.3 for substitutes' GWP. Certainly the market shares of equipment types calculated for leakage and the market shares for substitutes' GWP calculation cannot be the same because the CFC equipment in use is not large refrigeration and large AC. Domestic refrigeration is the largest share of CFC and this should be used in Table D.3 and D.4. Instead D.3 and D.4 have been chosen so that non-GWP/ODP substitutes do not appear.

One way to remove the HFC marketing impact would be to fully use the EPA Vintaging Model as it contains data for "dozens of subcategories" (as correctly said on p.65). In the monitoring requirements, chapter 6.4, the number of appliances shall be recorded. The subcategories in the Vintaging Model should be used, the number of appliances in each subcategory recorded and the average substitute GWP calculated respectively. This seems the straightforward way to apply the rationale of Appendix D. **(Proklima)**

RESPONSE: Noted. The Reserve worked closely with the workgroup to determine the appropriate baseline and project scenarios for analysis. To ensure conservativeness, the default baseline scenario is not continued use in the equipment from which the ODS refrigerant was removed, but rather recovery and sale to the market. With the baseline defined as sale to the refrigeration and air conditioning sector, the applicable emissions rates are those for which refrigerant recharge occurs; this is a subset of the entire refrigeration market, as equipment like residential refrigerators does not get recharged. Similarly, the substitutes and emission rates used for the analysis correspond to the recharge categories identified.

Imported: Appendix C EPA Rules Governing ODS Destruction

135. (First numbered list) Add "*Argon Arc Plasma*". See Table 1 of Destruction of Ozone Depleting Substances in the United States, Page 5. **(RemTec)**

RESPONSE: Agreed. The protocol has been modified accordingly.