CLIMATE ACTION RESERVE

SUMMARY OF COMMENTS & RESPONSES ON THE DRAFT NITRIC ACID PRODUCTION PROJECT PROTOCOL
November 11, 2009

10 sets of comments were received during the public comment period for the Draft Nitric Acid Production (NAP) Project Protocol, Version 1.0. In order keep this summary document to a reasonable size, some comments were edited for length, and similar comments were combined.

The comment letters can be viewed in their entirety on Reserve's website at http://www.climateactionreserve.org/how/protocols/in-progress/nitric-acid-plant-n2o-project-protocol/

Comments received by:

1. Rentech Energy Midwest (**REM**)
2. EcoChem Analytics (**ECA**)
3. Rhodia Brazil (**RBR**)
4. Nserve Environmental Services (**NES**)
5. Uhde (**UHD**)
6. Dr. Ed Bentz (**EB**)
7. Terra Industries Inc. (**TII**)
8. Blue Source, LLC (**BSL**)
9. ClimeCo America Corporation together with The Fertilizer Institute (**CAC/ TFI**)
10. Invista (**INV**)

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General Comments

1. There is no need for a production limit or a limit on ammonia input based on historical average production and historical ammonia input, respectively, in the protocol to ensure additionality for U.S. Nitric Acid N_2O abatement projects. It is not practical to overproduce HNO_3 in the US due to production costs relative to GHG revenue and lack of storage capacity. The problems and cost associated with storage and disposal of waste HNO_3 would far outweigh the production cost. (**TII**/ **BSL**/ **NES**/ **TFI**/ **CAC**/ **UDH**)

> **RESPONSE: While current economics of HNO_3 production suggest it is not practical to produce excess HNO_3 in comparison with what the market demands, future market conditions are uncertain. The Reserve feels this step in the protocol is a necessary safeguard to ensure that CRTs are not issued for reductions that occur as a result of HNO_3 production in excess of business as usual practice. The protocol does not limit how much HNO_3 can be produced, rather it constrains the allowable amount of claimed emission reductions by taking into account historical HNO_3 production levels. There is no constraint on emission reductions for plants that are producing HNO_3 at levels consistent with historic practice.**
>
> **With the above provision in place, the Reserve feels an appropriate safeguard is in place and there is no need to directly limit the flow rate of ammonia input (which correlates to HNO_3 production) to the NAP. Therefore, we have removed ammonia flow rate as a permitted operating conditions variable.**

2. Capping emission reductions by the average HNO_3 production during the historic campaign does not take into account normal fluctuations in nitric acid production due to seasonal influences (ambient temperature fluctuations influence the output capacity of the plant). It also does not take into account the influences of low demand situations for the product or plant shutdowns due to force majeure during the historical campaigns. (**NES**)

Instead of the average output, the cap should be based either on the maximum output (**NES**/ **BSL**) or on the maximum demonstrated rate or on the permitted production rate of the NAP (as specified in the plant manual). (**NES**)

Looking back to “5 campaigns” means very different things to different plants since campaign lengths can vary from 90 days to over a year. This historic look-back would represent very different market conditions (and therefore production conditions) for individual plants. Therefore, “5 campaigns” should be changed to “5 years” or longer to provide consistency for all plants and to capture true production histories. (**TFI**/**CAC**/**BSL**)

> **RESPONSE: The Reserve seeks an approach that best represents historical HNO_3 production levels and safeguards against overproduction. Therefore, we are modifying the protocol so that emissions reductions are limited by the maximum average annual HNO_3 produced at the NAP over five years prior to the project start date. This extends the period of time over which historical production levels are based and places limits based on maximum rather than average production values. Using the historical maximum HNO_3 production will address concerns about atypical situations and, while it does not directly take into account seasonal variations in production, it eliminates the influence of seasonal production lows.**

3. Suggestion to change the statistical analysis of historical data for permitted operating conditions (POCs) for both secondary and tertiary projects, to use a "preliminary accompanying statistical confirmatory sensitivity analyses" (the 95% confidence interval may not be at 1.96 times the standard deviation if the distribution is not Gaussian). (**EB**)

RESPONSE: The current approach is based on international standards established by the Clean Development Mechanism (CDM) methodologies AM0028 and AM0034. The alternative statistical method suggested in this comment is noted and will be evaluated along with other potential ongoing methodological improvements to the protocol.

4. We recommend to use Nm^3, Nm^3/h and mg/Nm^3 (or t, t/h and mg/t, respectively) for gas volumes, gas flow rates and N_2O concentration in the effluent gas stream throughout the protocol. We should avoid using m^3, m^3/h and mg/m^3, which will always need specifying the pressure and temperature conditions under which those parameters were measured. **(RBR)**

RESPONSE: According to the Reserve protocol format, the monitoring sections specifies details on the conditions and units for measuring relevant parameters, including gas flow rate and N_2O concentration. Table 6.1 in the public draft of the protocol specified that that gas volume flow rate and N_2O concentration should be expressed in terms of normal conditions (101.325 kPa, 0 deg C). However, this was missing from Table 6.2 and we have updated the table to include it.

5. Suggestion to consider provisions for using more up to date figures for GWPs or other GHG emission metric, if adopted in any post Kyoto agreement. According to latest 4th Assessment Report of IPCC. (**UDH**)

RESPONSE: The Reserve protocols use GWP values that are consistent with current requirements under UNFCCC and Kyoto Protocol GHG reporting. Any updates will be undertaken on a program wide basis.

2 The GHG Reduction Project

2.1 Background

6. The Reserve may wish to insert: With current catalyst technology, Non Selective Catalytic Reduction (NSCR) is more efficient at reducing N_2O, but entails a penalty of higher capital and operating costs. This is due to: the need to add fuel in the intake process; the need to have more expensive materials to support the higher stack gas temperatures (1,000-1,100 degrees F); and the associated need for higher maintenance costs. NSCR, however, can achieve reductions of 80-90% of N_2O. (Note: Some of these considerations have been identified in Appendix A, pp 61). (**EB**)

RESPONSE: Noted. This information and level of detail is appropriate for Appendix A, where it is already addressed.

2.2 Project Definition

7. During discussions with several NAP operators and with technology providers it became clear that several NAPs are currently not using getter or catchment gauzes. Plants are using different ways for recovery of platinum losses (filters, plant clean down). In the current version of the protocol these plants would not be eligible. The protocol should show more flexibility in this aspect in order to allow these plants to be eligible under the protocol. (**NES**/ **BSL** /**TFI**/**CAC**)

The possible effect on off gas N_2O concentration caused by platinum deposits in the plant could be covered by establishing a minimum project emission factor after 10 campaigns as in the CDM methodology AM0034. (**NES**)

> **RESPONSE: The Reserve understands that in North America, recovery of precious metals and regular plant cleaning are common practices and agrees that the getter gauze requirement can be removed.**

8. The 24-month idle time limitation is prohibitive and will negatively impact producers from having an incentive to control N_2O. For instance, there are producers that are bringing older plants (idle for more than 24 months) back on-line to meet customer demands. (**BSL**/**TFI**/**CAC**/**UHD**)

As an alternative to excluding NAPs that were shut down for a period of 24 months or longer, there could be a restriction that plants must operate for a certain time period before crediting begins to prove that their restart was based on market demands rather than CRT generation. (**BSL)**

> **RESPONSE: The purpose of this requirement is to ensure that idle plants are not brought back into production in response to the incentive to register CRTs with this protocol. Recognizing that currently operational plants are taken offline from time to time, we have provided the 24 month timeframe. We feel that a conservative approach is to assume that plants that have been idle for longer than 24 months would not have been brought back into production under business as usual.**

9. New NAPs should not be excluded from the protocol. (**UHD**)

Plants that are constructed after the effective date of the protocol should still be included if proof of intent to construct prior to the effective date can be provided. (**BSL**/**TFI**/**CAC**)

> **RESPONSE: This provision is included to ensure that no new NAPs are constructed in response to the incentive to register CRTs with this protocol. We agree, however, that if the intent to construct a new NAP can be documented as beginning prior to the effective date of the protocol, then that NAP should be eligible. Therefore, we have revised the protocol language to explicitly define what can be used to prove intent to construct a new NAP.**

10. Tertiary abatement, if installed downstream of an existing NSCR, should be an allowable project type and could incentivize additional environmental benefit than if NSCR plants are collectively excluded. (**BSL**/**TFI**/**CAC**)

RESPONSE: The Reserve recognizes there may be some potential to further reduce N_2O emissions from NAPs operating NSCR. However, the methodological approach would require going beyond the current international standards established by the CDM (which currently exclude NAPs operating NSCR) and we would need to undertake further research to ensure an appropriate methodology is developed. This project type may be considered under future protocol development.

11. It is quite likely that many nitric acid plants will first install "secondary" abatement because of its low investment, even though it achieves only 70 to 90% abatement in most applications… plants might want to consider adding a small tertiary unit in addition to secondary abatement to take abatement from 70 to 90% all the way to 99%. The combined approach would make it more feasible, and more likely, than eliminating secondary abatement and replacing it completely with tertiary. The secondary plus tertiary project would require only a small modification of the secondary methodology: the vent gas concentration would be measured AFTER the tertiary unit. Otherwise the methodology would be the same as secondary alone. (**INV**/ **UHD**)

RESPONSE: According to this protocol, a project is defined as the installation of a single N_2O abatement technology at a NAP, consistent with international standards established by the CDM methodologies. The suggested approach involves hybridizing two CDM methodologies into a combined approach and we would need to undertake a full review of the implications of this methodology, which was not possible under the timeframe of this process. We may consider this possibility in future protocol development.

3 Eligibility Rules

3.2 Project Start Date

12. We suggest changing all references to "submitted" to "submitted for listing." (**BSL**)

RESPONSE: Agreed. We will implement the change.

3.4 Additionality

3.4.1 The Legal Requirement Test

13. In order to broaden the methodology's applicability, we suggest allowing the NAP to participate in reduction activities under the protocol and use the legal requirement as the new baseline emissions factor in case it is lower than the established baseline emissions factor (comparable to EFreg in CDM Methodology AM0034). In practice, only emission reductions that are exceeding the regulatory requirement would qualify for the issuance of CRTs. This would incentivize the NAP operator to optimize the N_2O abatement system so that GHG emission reductions are maximized and do not stop at the threshold required by regulation. (**NES**)

RESPONSE: At this point in time, there are no regulations that obligate NAPs to abate N_2O emissions and the regulatory future is uncertain. As stated in the

protocol, should there be regulations of any kind that control N_2O emissions from NAPs in the future, emission reductions can no longer be awarded per this protocol. The Reserve notes, however, that the above suggestion would be inconsistent with a cap-and-trade approach to controlling N_2O emissions, as any reductions below the established threshold would be tradable as allowances in such a system and thus not eligible for offset credits. The suggestion could be consistent with other types of regulation, such as site specific emissions limits. If such regulations are enacted in the future, the Reserve may revise the protocol accordingly to establish a new performance threshold for crediting N_2O reductions.

3.4.2 The Performance Standard Test

14. The Reserve should consider amending “2. A tertiary N_2O abatement catalyst, including *catalytic decomposition, selective reduction or NSCR”* to include selective N_2O reduction e.g. with hydrocarbon. (**UDH**)

RESPONSE: Selective reduction was not examined in the performance standard research and is not considered as an eligible project type in the current international standards established by the CDM methodologies. We may consider opportunities for selective reduction in future updates to the protocol.

4 GHG Assessment Boundary

Table 4.2 Summary of Identified SSRs for Tertiary Catalyst Projects

15. It should be specified that emissions from ammonia production and use within tertiary abatement projects need only be accounted for when the technology requires it. If the technology does not require ammonia, such emissions would always be attributable to NOx abatement, not N_2O abatement. (**BSL**/ **UDH**)

RESPONSE: It would be difficult to verify in a standard way the intent of SCR installation, i.e., whether de-NOx SCR was installed concurrent with a de-N_2O tertiary catalyst for the sole purpose of abating NOx or to enable N_2O abatement by the tertiary catalyst. Therefore, the protocol takes the conservative approach of requiring tertiary projects that did not operate SCR prior to project implementation to quantify and report relevant SSR associated with operating the SCR during the project.

5 Quantifying GHG Emission Reductions

5.1 Secondary Catalyst Project

5.1.1 Quantifying Baseline Emissions

16. 5.1 (and section 5.2.1) The limit based on historic HNO_3 production as applied to NAPs upgraded within 24 months of the project start date or anytime during the project could exclude capacity upgrades that were already in progress well before the development of the protocol or the possible benefits of generating ERs were expected. Discussions with several NAP operators shows that the possible incentive of ER credits is extremely unlikely to influence the decision making process of upgrading the existing capacity or building new capacity. These decisions are strictly based on the product demand and market situation and the small benefits from ER credits would not trigger such a big investment. Therefore the protocol should allow upgraded and new capacity plants also younger than 24 months. (**NES**)

> **RESPONSE: As noted in response to Public Comment #1, given the uncertainty of future market conditions, the Reserve feels it is necessary to safeguard against the possibility that CRTs could be issued for reductions that occur as a result of HNO_3 production in excess of business as usual practice, including HNO_3 production increases enabled by capacity upgrades. In this protocol, NAPs that were upgraded or otherwise modified to increase production within 24 months prior to the project start date or at any time during the project crediting period are eligible for secondary or tertiary projects. However, historical HNO_3 production levels used to constrain emission reduction calculations are based on five years of data prior to the upgrade.**

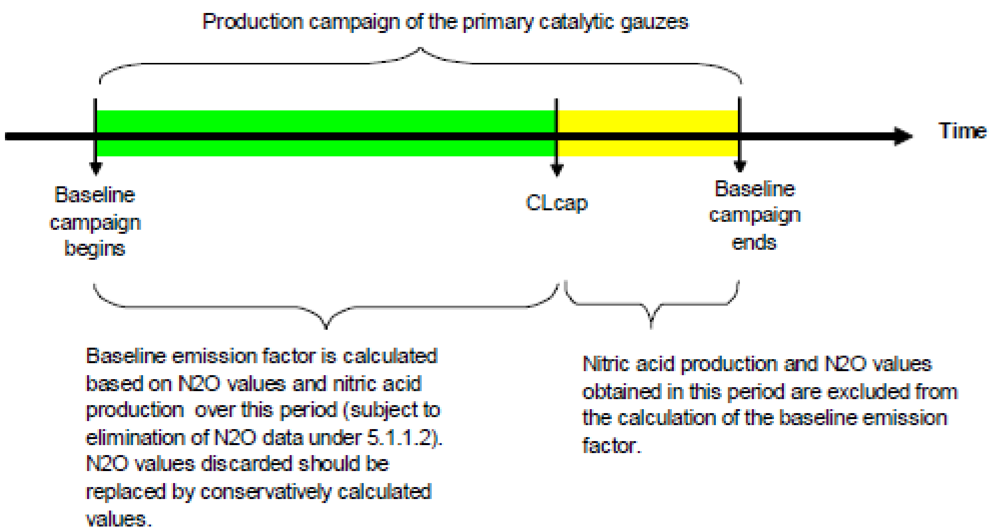
5.1.1.1 Permitted Operating Conditions

17. The Reserve may wish to add to the POCs a determination of maximum age (useful life) and condition of catalyst. Reactor yields are very dependant on catalyst efficiency, which in turn, is affected by the operating parameters identified and catalyst condition. (**EB**)

> **RESPONSE: The list of POC variables is based on international standards established by the CDM methodologies. This suggestion is noted and may be further considered in future revisions of the protocol.**

5.1.1.3 Campaign Length

18. The N_2O values and the nitric acid production values must be comparable. If that is not clearly stated then some N_2O values may end up being discarded while the nitric acid production remains unchanged. That would incorrectly reduce the value of the baseline emission factor. Example: baseline sampling period greater than CLcap (**RBR**)



RESPONSE: Noted. The protocol was clarified per this suggestion.

5.1.2 Quantifying Project Emissions

5.1.2.3 Calculating Campaign-Specific Project Emissions

19. Concerning the language: "If the NAP operates outside of the established range for permitted operating conditions for more than 50% of the duration of the campaign, the N_2O emissions data are considered invalid and no emission reductions can be claimed by the project for that campaign," although this constraint seems well justifiable for the baseline campaign it does not seem justifiable for a project campaign because once the baseline emission coefficient is established the nitric acid plant should be entitled to be improved as a result of technological progress, capacity debottlenecking, etc. If the project owner makes any process improvements that lead to operate outside the permitted operating conditions but generating fewer N_2O emissions that would be good for the environment anyway. Conversely if the modifications lead to higher N_2O emission, then the emission reductions would be comparatively smaller which is conservative. The only constraint should be on the nitric acid production volume before and after the baseline sampling period (which is already well defined in equation 5.1) **(RBR)**

There should be no need to monitor the operational parameters during *project* campaigns, because there is no incentive for the plant operator to manipulate the operating parameters in one way or the other: N_2O emission increases lower carbon revenues and decreases are aimed at anyway in order to maximize them. On the other hand, there could be technological problems (e.g. slightly decreasing performance of the compressor unit or minimal increases of pressure drop due to the installed abatement system) that cause the plant to operate outside the historic limits. Also, there is no need to exclude emission reductions achieved at times when parts of the plant equipment were not fully functional. It is common practice to continue running an NAP for some time in spite of such deficiencies in order to repair during a major shutdown or maintenance stop. Therefore all operating conditions should be permissible for project campaigns in secondary catalyst projects. (**NES**)

RESPONSE: The Reserve has included this requirement to ensure that the

baseline emission factor for secondary projects is always comparable to the project emission factor throughout the project crediting period. The baseline emission factor represents business as usual emissions. If during the project, process improvements are undertaken at a NAP or if equipment malfunctions occur for extended periods of time, leading to significant changes in operating conditions and thus GHG emission trends, this would be a significant change from business as usual conditions as determined in the original baseline sample.

The Reserve recognizes that we have taken a different approach than the CDM methodologies to controlling for business as usual N_2O emissions trends. Unlike the CDM, the Reserve allows for unrestricted changes to the primary catalyst and does not require calculating a moving average project emission factor or the use of a project emission factor floor. We feel that requiring NAPs to operate under conditions consistent with the baseline sampling period sufficiently and more directly controls for possible business as usual N_2O emissions trends. It is also our understanding that NAPs in the United States tend to run under fairly stable operating conditions and it is not likely that they would significantly deviate from POC during the project crediting period.

5.2 Tertiary Catalyst Project

5.2.1 Quantifying Project Emissions

5.2.1.3 Calculating Emissions from Hydrocarbon Use

20. Regarding Equations 5.12, this factor ($OXID_{HC}$) must always be set to 100%, otherwise the GHG emissions resulting from the use of higher hydrocarbons (CO_2) will be ignored. Higher hydrocarbons (ethane, propane, butane, etc.) are not considered to be greenhouse gases in the Kyoto Protocol presumably because they are so reactive that they are converted to CO_2 in the atmosphere quickly in relation to typical GHG lifetimes.

The use of $OXID_{CH4}$ in these formulae begs the question of how to obtain this parameter. $OXIDC_{CH4}$ cannot be measured directly and is also not a constant number, at least for Uhde EnviNOx® technology. A simpler approach to allow for the effect on project emissions of CO_2 and CH_4 emissions from any hydrocarbons used in the destruction facility (DF) which uses measurable data would be: either conservatively assume that all the CH_4 in any fuel or reducing agent supplied to the DF is emitted unchanged and all other hydrocarbons are converted to CO_2 or measure the CH_4 concentration on the outlet side of the DF (online analyzer for continuous measurement of CH_4 required). From this the amount of CH_4 that passes unchanged through the DF can be calculated. Assume that the remaining CH_4 and all the higher hydrocarbons in the hydrocarbon input are converted to CO_2. (**UDH**)

RESPONSE: Agreed. We have modified equations 5.12 and 5.13 consistent with setting $OXID_{HC}$ and $OXID_{CH4}$ to 100%. We believe this is a conservative and relatively simpler approach.

5.2.1.4 Calculating Project Emissions from Tail Gas Re-heating

21. If energy recovery occurs and can be shown to displace fossil fuel-based energy generation (thermal or electric), the project ought to be credited with such incremental reductions. (**BSL**)

RESPONSE: The Reserve is taking a conservative approach by not including this SSR if energy recover occurs, but also not giving credit for displacement of fossil fuels from such energy recovery. As a general rule, the Reserve avoids crediting project activities that result in indirect emissions reductions, such as displaced energy production. Further methodological development would be needed to discern direct from indirect GHG emissions reductions associated with changes in on-site energy consumption. We may consider including this in future protocol revisions.

6 Project Monitoring

22. As an alternative to measuring the tail gas flow rate, it would be possible to calculate the tail gas flow rate by a mass balance using the tail gas oxygen concentration upstream of any NSCR and either the total air (primary + secondary) entering the NAP or the ammonia flow rate to the ammonia oxidation. (**UHD**)

RESPONSE: To remain consistent with EPA's Continuous Emissions Monitoring System (CEMS) standards, which require direct measurement of tail gas flow rate, we will not be considering alternative gas flow monitoring approaches.

6.1 Monitoring Requirements

23. The monitoring provisions of the N_2O project protocol should be streamlined and synchronized as much as possible to be consistent with existing EPA standards for CEMS found in 40 CFR Part 60 (NSPS provisions) and only where applicable should 40 CFR Part 75 (Acid Rain provisions) be applied. Nitric acid producers in the U.S. currently follow 40 CFR Part 60 provisions for NOx CEMS and are already familiar with and prepared to implement the same for N_2O monitoring systems. (**TII/TFI/CAC**)

For 6.1.1 to 6.1.3- we suggest part 60 instead of part 75. Our CEMS do not meet the requirements of 40 CFR 75 (acid rain program). These requirements are very extensive, especially in terms of CEMS equipment maintenance and recordkeeping. If we are required to follow the 40 CFR 75, the frequency of RATA and linearities may be more than annual. Specific "major" maintenance activities that are performed on the analyzer system require a linearity and/or RATA be performed to verify analyzer performance following repair. Also, if the results of a RATA test exceed 7.5% relative accuracy, the frequency of testing goes from annual to semi-annual. **(REM)**

RESPONSE: Because CEMS monitoring rules specific to N_2O emissions do not exist, the Reserve is incorporating relevant aspects of existing CEMS guidelines for NOx emissions monitoring. We have incorporated sections of 40 CFR part 75 where necessary to ensure project monitoring is consistent with emission trading standards. In addition, 40 CFR part 75 is consistent with EN14181, the European monitoring standard required by CDM methodologies. As noted in Section 6.1, 40 CFR part 60 may be referred to for general guidance, in particular during system installation and certification. As a general rule, the requirements of 40 CFR part 75 should be followed. We have clarified this in the protocol.

24. The "length of the interval i (and the calibration of the N_2O instrument which is using a continuous batch process) should be selected to match the behavior of the stack gas flows so that excessive highs and lows are not "washed out" in the data reporting cycle. Different time intervals are required for secondary (every one minute) and tertiary (continuous and summed over interval i. (**EB**)

> **RESPONSE: Noted. We will continue to use the monitoring guidelines under 40 CFT part 75, which prescribes the monitoring frequencies and instrument calibration requirements. However, we recognize that there were inconsistencies in the protocol regarding monitoring frequencies and this was an editorial error, which was fixed.**

6.1.3 Accuracy Testing

25. EcoChem would like the Climate Action Reserve to recognize other alternative methods (besides FTIR) as valid reference methods for RATA verification of a N_2O CEMS. Currently, NDIR technology based analyzers are the most widely used approach for continuous monitoring of N_2O emissions. There already exist the following guidelines:

> *a) ISO / DIS 21258 -- Rev 01 -- Stationary source emissions — Determination of the mass concentration of dinitrogen monoxide (N_2O) — Reference Method: Non- dispersive infrared method* (Reference 1). This standard describes a protocol where NDIR analyzers can be used for N_2O verification testing.
>
> b) *AM0034 / Version 03.3 - Approved baseline and monitoring methodology AM0034 --- "Catalytic reduction of N_2O inside the ammonia burner of nitric acid plants*" (Reference 2). This UNFCCC – CDM methodology also specifies the use of NDIR technology for N_2O monitoring.

An alternate approach is to use a Performance Specification based Reference Method as opposed to a Technology Specified approach (like the above). US EPA has promulgated Method 7E—Determination of Nitrogen Oxides Emissions From Stationary Sources (Instrumental Analyzer Procedure) (Reference 3). This method does not specify a particular technology (for example, chemiluminescence, NDIR, FTIR etc.) for conducting the reference method but simply requires that whatever method be used should meet specific performance requirements. EcoChem urges the Climate Action Reserve to consider this line of thinking while considering a reference method for N_2O monitoring. EcoChem recommends an analogous instrumental method to EPA Method 7E be also developed for N_2O monitoring. Allowing this approach will ensure that verification organizations (primarily stack testers conducting RATA) will have flexibility in choosing the RATA method. (**ECA**)

> **RESPONSE: Agreed. Because there is not a standard reference test method for N_2O CEMS at this time, the protocol was revised to include NDIR and other reference methods as eligible methods.**

6.2 QA/QC Requirements

6.2.1 Frequency of Testing

26. This requirement should exclude weekends and scheduled plant holidays. This activity would normally be done by maintenance personnel, not 24/7 operations personnel. (**REM)**

RESPONSE: Noted. It is our understanding that daily quality assurance tests can be automated within the CEMS system. A person does not need to be on-site to monitor each assessment; rather data are stored and can be retrieved at a later date for analysis. This should not require specialized staff to work on weekends or plant holidays.

6.4 Monitoring Parameters for Secondary Catalyst Project

27. There are numerous frequency requirements that assume that the facility is on a Distributed Control System. Our plants and I suspect others may have legacy instrumentation. It seems that readings every minute is excessive. Normal operations data logging is every two hours. This is especially important in section 5.1.1 where hourly data is required for 5 historical campaigns. This is not currently available. (**REM**)

RESPONSE: The monitoring frequency required by CEMS is incorporated into this protocol and should be used for baseline and project emissions monitoring. However, recognizing that historical information based on the same rigorous monitoring systems may not be available, we have specified in the protocol that permitted operating conditions and historical HNO_3 production levels must be based on the best available information.

28. Specific comments to Table 6.1 (**UDH**):

i) Number each parameter P1, P2,… or B1, B2,… as in AM0028 or AM0034 for easier identification.
ii) The historical range of ammonia:air ratios is missing
iii) The units of ammonia:air ratio is %, not m_3/h.
iv) Consistent units between Secondary and Tertiary parameters are desirable, e.g., either tNH_3/h (secondary) or $kgNH_3$/h (tertiary) but not both.
v) bar g for historical and current ammonia oxidation operating pressure seems a more practical unit than Pa. Some of the other parameters are not in SI either.

RESPONSE: Agree. These issues have been corrected, with the exception of (i), which was not changed because per our formatting standards we identify parameters by equation number and parameter label.

6.5 Monitoring Parameters for Tertiary Catalyst Project

29. Specific comments to Table 6.2 (**UDH**):

vi) For the (tail gas) volume flow rate measurement, are not continuous T and P measurements also necessary to provide a T,P correction?
vii) $OXID_{HC}$ should not be measured but set to 100% (see comment on CH_4 concentration measurement above)
viii) $OXIC_{CH4}$ cannot be measured. Better to measure the CH_4 outlet concentration or assume any CH_4 in inlet hydrocarbon is emitted unchanged.
ix) EF_{HC}, “Carbon emission factor of hydrocarbon, with two or more molecules of carbon” is a parameter that depends on the composition of the hydrocarbon fuel or reducing

agent, therefore the composition of the hydrocarbon needs to be monitored on a regular basis, e.g. once per year and EF_{HC} calculated from

RESPONSE: Agree. These issues have been corrected.

7 Reporting Parameters

7.3 Record Keeping

30. What is the purpose of the second bullet ("Copies of all …")? This seems excessively intrusive. I think it is more appropriate that the facility sign an affirmation that N_2O control is not required by regulation or any other agreement. **(REM)**

RESPONSE: Noted. The project developer does have to sign the Reserve's regulatory attestation form. The permit records are kept by the project developer (not the Reserve) for verification purposes only.