



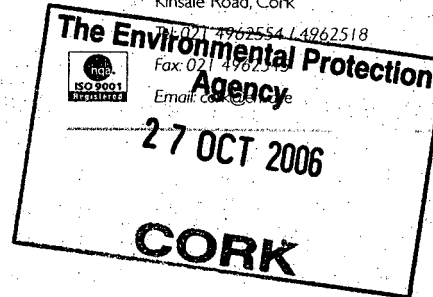
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**Brendan Foley**  
Office of Environmental Enforcement,  
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www.enva.ie

26<sup>th</sup> September 2006

License Number: W0041-01

**REF: BAT EVALUATION OF SEW FOR AMMONIA BIFLUORIDE**

Dear Mr Foley,

With reference to our conversation yesterday regarding BAT assessment of our proposed SEW for Ammonium Bifluoride Recovery Plant we have fully evaluated this document ("IPPC Reference Document on Best Available Techniques in Common Waste Water and Waste Gas Treatment / Management Systems in the Chemical Sector") and can confirm that the proposal is BAT.

The pertinent issues are as follows;

- The system minimises fugitive loss as it is enclosed. For example following the initial reactor stage ammonia liquor is separated from the precipitate by means of a centrifuge rather than a filterpress. Additionally, diffuse ammonia emissions from the initial reactor are drawn through the recovery process rather than allowing their discharge to air. Thus no emissions arise other than ducted emissions.
- The entire purpose of the plant and process is for recovery of ammonia. Thus measures to reduce concentration of ammonia in the air discharge are considered to be related to process efficiency rather than purely end-of-pipe/abatement measures.
- Further to the above point, spent liquor from the stage 3 scrubber will be reused within the stage 2 scrubber resulting in full conversion to product (ammonium sulphate/ammonium nitrate).
- Environmental impacts of the process will include conversion of waste ammonium bifluoride to raw material product and a non-hazardous sludge, minimal releases of ammonia to air, effluent (from stage 1 – air stripping) which will require only minimal further treatment (if any), minimal energy consumption (extraction fans etc). Due to the waste recovery function of the process these impacts are lower than those outlined in the reference document.
- The process will be managed under the site's existing Environmental Management System including monitoring of ammonia emissions, waste inputs, product output, effluents generated etc. These will be evaluated and improvements implemented where identified. Emergency control features include isolation/shut-off of ducting supported by on-line monitoring, SCADA and alarms.
- With regards to stage 1, Ammonia Stripping is specifically mentioned in the reference document (part 3.3.4.2.1.4). It is cited as supporting high ammonia removal efficiency (>92%), material recovery and low energy consumption. Disadvantages

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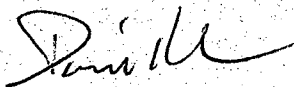
Page 1 of 2

cited are not relevant to this process as anti-fouling agents will not be necessary and the "treatment of the stripped gas" (combination with acid to produce fertiliser raw material) is the deliberate purpose of the process.

- With respect to separation of precipitate following initial reaction stage, part 3.4.1 of the reference document cites minimal odour problems among the advantages of centrifuges.
- With regard to stages 2 and 3 (scrubbers) part 3.5.1.4 supports wet scrubbers for gas removal. The advantages include very high efficiency, simple and robust technology as well as simple maintenance. Disadvantages cited are generally not applicable to this process. For example, instead of waste water being generated in the scrubbers, acid will be combined with the ammonia to produce a raw material product. Assessment of the tendency for bed plugging is one of the reasons for which Enva wish to run the trial. The achievable emission levels cited in this section are stated as above 99% for acid (which is relevant to our system). Part of the trial will be to assess the efficiency of the unit by the means suggested in the reference document.
- Chapter 4 of the reference document states that for waste gases ("other compounds than VOCs") "BAT is to recover  $\text{NH}_3$  (i.e. ammonia) whenever feasible, using a technique that enables its recovery". Both of the scrubbers (stages 2 and 3) carry out this function.

I trust the above is satisfactory. If you have any further queries in relation to this please do not hesitate to contact me at the earliest possible opportunity.

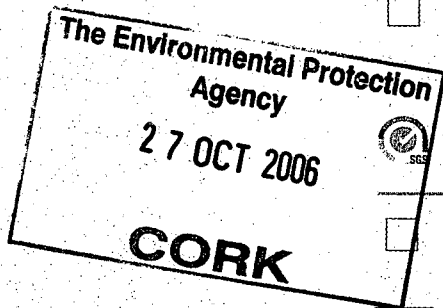
Yours sincerely,



David Burke  
HSE & Compliance Manager.

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ENCL.  
None



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25<sup>th</sup> September 2006

License Number: W0041-01

**REF: COMPLAINT RECEIVED FROM HSA**

Dear Mr Foley,

I am writing to inform you of a complaint made by the HSA in relation to odours from our facility in Shannon.

The complaint was received by our head office rather than this site. As a result we did not receive the complaint here until several days later. The HSA have not identified the dates of the odour, except to say that it occurred infrequently. Furthermore no complaints were received directly to our company.

We have spoken to the company identified as the complainant. Management there were unaware of who had made the complaint. Upon further discussion there was confusion between our site and a neighbouring facility's emission. The HSA had characterised the odour as ammonia type however there seemed to be confusion about the character of the smell when we questioned the complainant company.

As no contact was made directly at the time of the alleged odour we cannot pinpoint the source (on-site or off-site). As a result we have instructed the complainant to make direct contact with us immediately should the issue arise in the future.

We have surveyed the perimeter of the site adjacent to the complainant's facility and no odour was detected. We will continue to investigate this matter and be vigilant for any potential sources. We will also review existing odour monitoring procedures against relevant best practice guidelines.

I trust the above is satisfactory. If you have any further queries in relation to this please do not hesitate to contact me.

Yours sincerely,

David Burke  
HSE & Compliance Manager.

ENCL.  
None

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