Chrono

NSW EPA

ENVIRONMENT PROTECTION AUTHORITY

Our reference: DOC11/52771,
File No. FIL11/7069
Contact: Hamish Rutherford
(02) 4908 6824

Department of Planning & Infrastructure
GPO Box 39
SYDNEY NSW 2000

Attention: Ms Felicity Greenway

Dear Sir/Madam

PROPOSED MARSTEL BULK LIQUID FUEL STORAGE FACILITY, MAYFIELD (08_0130)

Reference is made to your letter to the Environment Protection Authority ("the EPA") dated 14 November 2011 inviting the EPA to make a submission on the above proposal, including any recommended conditions of approval.

The EPA understands the proposal comprises the following:

- Development of a tank farm with the capacity to receive, store and dispatch diesel and biodiesel liquid fuel products. The tank farm would have a storage capacity of 54ML, with the facility having an annual throughput of 300ML.
- Use of the existing shipping berth known as Mayfield No. 4 to receive diesel fuel from sea.
- Development of a pipeline to transfer diesel unloaded at the Mayfield No. 4 berth to the tank farm.

The EPA has reviewed the proposal and the supporting Environmental Assessment (EA) prepared by AECOM dated 4 November 2011. The EPA advises that the Environment Assessment is inadequate for determination. The issues that require further assessment and consideration are briefly described in this letter. Detailed comments are provided in Attachment 1.

1. Air Quality

Issues identified in the EPA's review of EA's Air Quality Impact Assessment (AQIA) include the following.

- The assessment is based on tanks that have internal floating roofs. The EPA considers this to be unlikely for the storage of diesel and biodiesel. If the tanks do not have internal floating roofs, the emission estimates and AQIA need to be revised.

- Emission estimates included in the AQIA were based on meteorological data from San Francisco. The proposed facility is located in Newcastle, NSW. Therefore, the emission estimates included in the assessment are incorrect.

- Benzene is identified as the most critical air pollutant and is the only air pollutant identified from the proposal. The EPA has reviewed the proposal and concluded that it is unlikely that benzene will be

➢ PO Box 488G Newcastle NSW 2300
➢ 117 Bull Street, Newcastle West NSW 2302
➢ Tel: (02) 4908 6800 Fax: (02) 4908 6810
➢ ABN 30 841 387 271

released from the sources identified in the assessment and there are numerous other air pollutants not identified or assessed.

- The AQIA fails to identify or consider significant air emission sources that would be a direct result of the proposed facility. Air emission sources not identified or assessed include combustion emissions from ships and combustion emissions from road tankers.

2. Noise

The predicted construction and operational noise, vibration and traffic impacts associated with the project is within the nominated criteria. However the EPA's review of the EA's Noise and Vibration Assessment has identified a number of omissions that should be address in order to provide confidence that the predicted noise and vibration impacts associated with the proposal are within acceptable levels.

Given the above the EPA is unable to appropriately assess the proposal and its potential environmental impacts. Accordingly the EPA is unable to provide any recommended conditions of approval in respect of this proposal.

If you require any further information regarding this matter please contact Hamish Rutherford on (02) 4908 6824.

Yours sincerely

20 DEC 2011

MARK HARTWELL
Head Regional Operations Unit – Hunter
Environment Protection Authority

Attachment 1.

ATTACHMENT 1

ENVIRONMENT PROTECTION AUTHORITY- COMMENTS ON THE PROPOSED MARSTEL BULK LIQUID FUEL STORAGE FACILITY, MAYFIELD (08_0130)

1. AIR QUALITY IMPACT ASSESSMENT

1.1 Tank Emission Estimation Review

AECOM used US EPA's "TANKS" program to estimate emissions of volatile organic compounds (VOCs) from the proposed tanks at the facility. The EPA has identified the following fundamental issues in the emission estimates.

1. The tanks were modelled as internal floating roof tanks; and
2. The tanks were modelled using San Francisco meteorological data.

Each of these issues is discussed separately in this section.

1.1.1 Tank Types

Generally, tanks for a particular fluid are chosen according to the flash-point of the substance stored. Generally, there are fixed roof tanks, and floating roof tanks.

- Floating roof tanks are generally used for liquids with low flash-points (e.g. motor spirit, petrol, ethanol). These tanks have a floating roof which travels up and down along with the liquid level. This floating roof traps the vapour from low flash-point fuels.
- Fixed roof tanks are meant for liquids with high flash points, (e.g. fuel oil, diesel, bitumen etc.).

It is likely that the tanks at the Marstel Terminals proposal will use 'vertical fixed roof tanks' rather than 'internal floating roof tanks'. This will significantly impact the estimated emissions for the proposed facility.

Tanks with an internal floating roof design will have significantly lower emissions than emissions from a fixed vertical roof design.

The EPA recommends that the proponent confirm that all storage tanks are internal floating roof tanks.

1.1.2 Meteorological Data

The US EPA program "TANKS" requires site specific meteorological data in order to estimate emissions of VOCs from tank loading and breathing. TANKS does not come with Australian meteorological data and has only data for cities in North America. Australian users of TANKS are required to enter site specific data in order to correctly run the model locally.

The EPA notes that the meteorological data used in the assessment is the default data set shipped with the software program for San Francisco. This is significantly different meteorological conditions to those expected at the proposed site.

The EPA has performed a comparison of meteorological conditions that should have been used in the assessment from those of San Francisco. The difference in monthly maximum and minimum temperature between NSW and San Francisco is presented in Figure Error! **No text of specified style in document.-1**.

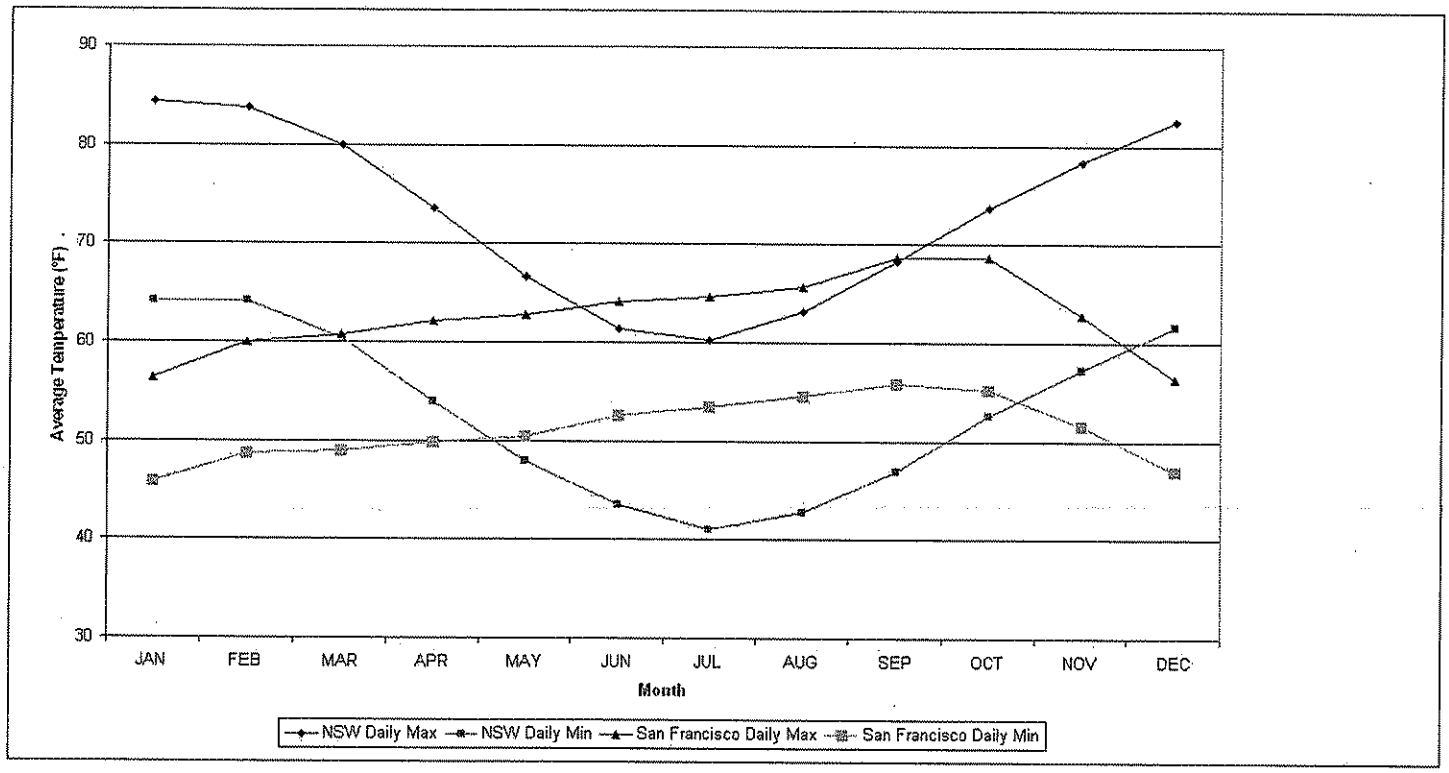

Figure Error! No text of specified style in document.**-1: Difference in Max and Min Temperatures between NSW and San Francisco**

The difference in solar insulation factors between NSW and San Francisco is presented in Figure Error! **No text of specified style in document.-2**.

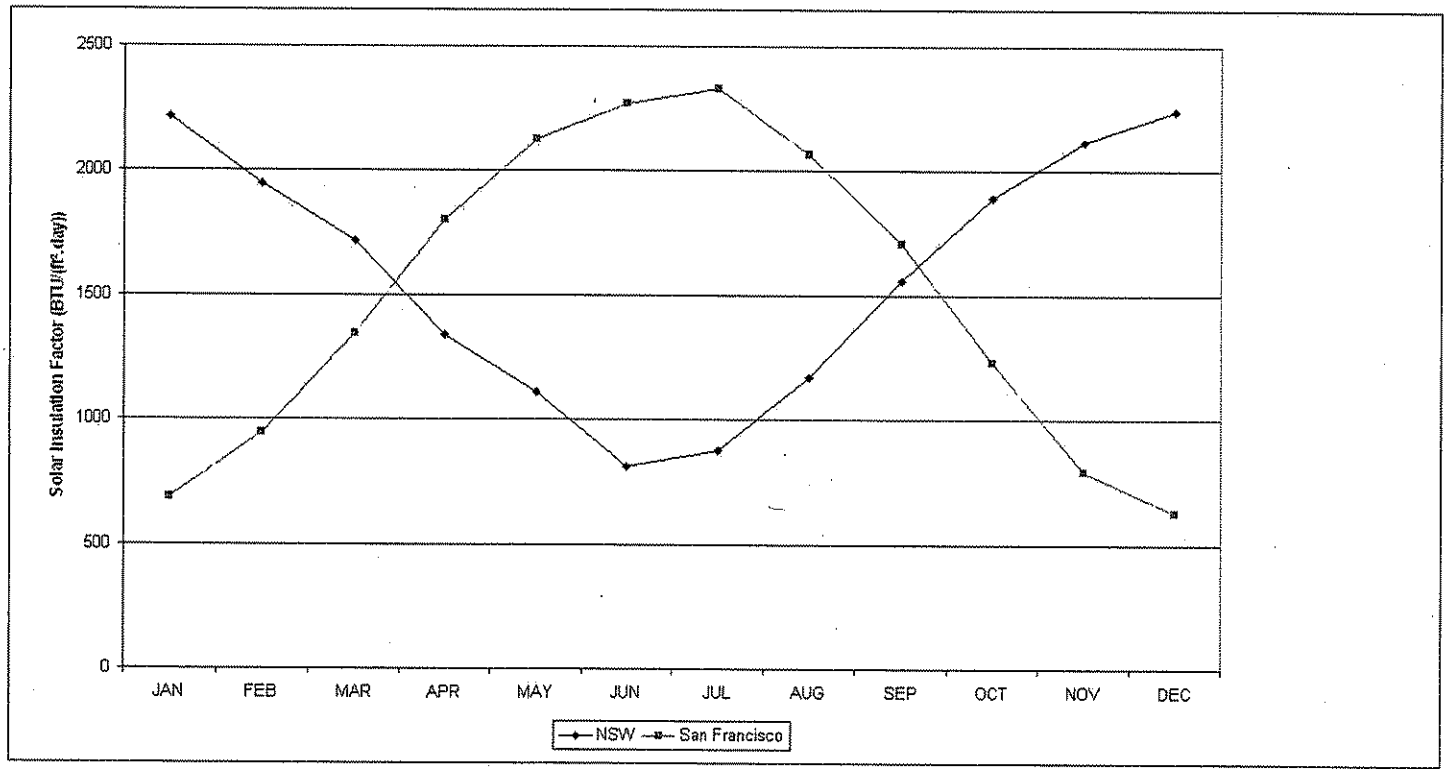

Figure Error! No text of specified style in document.**-2: Difference in Solar Insulation Factor between NSW and San Francisco**

The EPA notes that wind speed is also used in estimated emissions by the TANKs program. However, this information is not presented in the Environmental Assessment's Air Quality Impact Assessment ("AQIA"). It is assumed that San Francisco average wind speed was used in developing the emission estimates.
By using San Francisco meteorological data, maximum emissions from the proposed tanks have been estimated to occur during winter and minimum emission have been estimated to occur in summer. This is the opposite of what would occur. However, as the emissions are from a low volatility liquid, the majority of emissions are from working loss and not from breathing loss.

Using the incorrect meteorological data in TANKS has resulted in incorrect emissions being estimated for the air quality assessment.

The EPA recommends that site specific meteorological data is used to assess the impacts of the proposed facility in a revised air quality assessment.

1.1.3 Assessment of Benzene

The EPA notes that AECOM assessed emissions of benzene from the storage and handling of diesel and biodiesel as this was considered to be the most critical air quality parameter for the assessment. AECOM base this assessment on:

- the liquid concentrations of benzene concentrations for crude oil and petrol.
- the Australian Diesel Fuel Quality Standards a maximum content of polycyclic aromatic hydrocarbons of 11%.

AECOM used an estimated maximum content of benzene in diesel vapour of 11% in the air quality assessment.

This is incorrect, crude oil and petrol are not stored or proposed to be stored on the site. The composition of petrol and crude oil are significantly different to the composition of diesel. The poly aromatic hydrocarbon (PAH) content of diesel in the liquid phase is not a reasonable indicator of benzene concentration in diesel. If diesel could contain so much PAHs, which AECOM note "are typically more toxic", emissions from this toxic group of substances should be assessed.

The EPA notes that diesel typically does not contain or contains only trace amounts of benzene in the liquid or vapour phase. An example of the composition of diesel (vapour phase) has been obtained from B.P. and is as detailed in Table Error! **No text of specified style in document.-1**.

Table Error! No text of specified style in document.**-1: Composition of Diesel Vapour Phase**

Temperature Deg C	15	20	25
Density liquid diesel kg/L	0.7930	0.7894	0.7859
Density vapour (inc. air) g/L	1.187	1.168	1.149
Concentration of HC in vapour g/L	0.00237	0.00327	0.00445
Composition %w/w			
UNDECANE	0.26	0.28	0.30
DODECANE	0.75	0.83	0.91
TRIDECANE	0.48	0.55	0.62
TETRADECANE	0.34	0.40	0.48
PENTADECANE	0.12	0.14	0.17
HEXADECANE	0.02	0.03	0.04
HEPTADECANE	0.01	0.01	0.02
OCTADECANE	0.00	0.00	0.00
NONADECANE	0.00	0.00	0.00
EICOSANE	0.00	0.00	0.00
TOLUENE	2.95	2.77	2.60
ETHYLBENZENE	0.61	0.59	0.57
M-XYLENE	4.47	4.33	4.20
O-XYLENE	4.82	4.70	4.58
CUMENE	5.10	5.04	4.99
PROPYLBENZENE	6.16	6.13	6.10
3-ETHYLTOLUENE	12.05	12.00	11.95
4-ETHYLTOLUENE	19.88	19.77	19.66
2-ETHYLTOLUENE	10.30	10.31	10.32
1,3,5-TRIMETHYLBENZENE	10.48	10.56	10.63
1,2,4-TRIMETHYLBENZENE	7.45	7.53	7.60
1,2,3-TRIMETHYLBENZENE	13.76	14.02	14.26

Also, the National Pollutant Inventory (NPI) published compositional values for the liquid phase of diesel indicating that the typical concentration of benzene in the liquid phase of diesel was 0.0008% (i.e. trace amounts found in diesel). Based on the vapour phase composition presented in Table Error! **No text of specified style in document.-1**, the most critical substance to air quality impacts from emissions of diesel vapour is cumene as shown in Table Error! **No text of specified style in document.-2**.

Table Error! No text of specified style in document.**-2: Assessment of Emissions of Impact Assessment Criterion**

Substance	Impact Assessment Criterion (mg/m^3 - 1 hour)	Estimated Emissions (kg/year)	Estimated Emissions (g/second)	Indicator
Benzene	0.029	0	0	0
Cumene	0.021	124.899	0.0040	1.0000
Ethylbenzene	8	14.9389	0.0005	0.0003
Trimethylbenzenes (all isomers)	2.2	776.0881	0.0246	0.0593
Toluene	0.36	72.2455	0.0023	0.0337
Xylenes (all isomers)	0.19	227.5121	0.0072	0.2013

The EPA recommends that the air quality assessment is revised to account for toxic substances that are expected to be released from the storage and handling of diesel.

1.2 Unaccounted for Air Pollution Sources

1.2.1 Combustion in ships (auxiliary boiler and auxiliary engine)

The most significant unaccounted air pollution source that has been identified is combustion sources from ships.

The Environmental Assessment quotes between eight (see page ii) and fifteen (see the greenhouse assessment) ships per year. It is quoted that unloading takes 36 hours per ship and fuel consumption rates are 36 tonnes per day. The EPA has assumed that the fuel consumption figure quoted in the greenhouse gas assessment is for ocean going travel (i.e. maximum main engine load). During unloading of fuel, typically only the auxiliary engine and auxiliary boiler are operating. These engines are typically total 16% of the total power across all engines in a bulk carrier. Therefore, it could be estimated (using a screening level assessment approach) that the maximum fuel consumption while in port is 0.16 * 36 tonnes per day or 5.8 tonnes per day. If a load factor reduction is incorporating into the fuel consumption estimate to account for the auxiliary engine and auxiliary boiler being at close to 13% full load (taking the average for Newcastle port in "hotel" operating mode), the fuel consumption while a ship is in port is estimated to be approximately 1 tonne per day.

Table Error! No text of specified style in document.**-3: Typical engine size for a bulk carrier**

Ship type	Main engine (kW)	Auxiliary engine (kW)	Auxiliary boiler (kW)
Bulk Carrier	10,163	1,812	132

Therefore, using a screening methodology approach the total amount of additional fuel combusted by ships less than 1 kilometre from the location of the tanks and approximately 1 km from sensitive receptors is between 24 and 130 tonnes per year and the maximum fuel consumption over a day is 5.8 tonnes per day. Combustion emissions from ships include the following air pollutants:

- OXIDES OF NITROGEN
- NITRIC OXIDE
- NITROGEN DIOXIDE
- AMMONIA (TOTAL)
- SULFUR DIOXIDE
- TOTAL SUSPENDED PARTICULATES (TSP)
- PARTICULATE MATTER 10µm
- PARTICULATE MATTER 2.5µm
- TOTAL VOCS (AND INDIVIDUAL ORGANIC TOXICS (PRODUCTS OF INCOMPLETE COMBUSTION))
- CARBON MONOXIDE
- POLYCYCLIC AROMATIC HYDROCARBONS
- POLYCHLORINATED DIOXINS AND FURANS
- LEAD & COMPOUNDS
- CADMIUM & COMPOUNDS
- MERCURY & COMPOUNDS
- ARSENIC & COMPOUNDS
- CHROMIUM (III) COMPOUNDS

- CHROMIUM (VI) COMPOUNDS
- COPPER & COMPOUNDS
- NICKEL & COMPOUNDS
- SELENIUM & COMPOUNDS
- ZINC & COMPOUNDS
- VANADIUM & COMPOUNDS

Additional combustion emissions in the area will add to an already constrained airshed and an assessment has not been made on the impact this proposed facility will have on the air environment of these pollutants.

The EPA recommends that the impact of combustion from ships using the proposed facility is included in the revised air quality assessment. The air quality assessment should include an assessment of cumulative impacts for relevant pollutants.

1.2.2 Combustion from Trucks distributing Fuel from the Facility

The air quality assessment also does not include combustion emissions from trucks loading fuel from the facility. This is an additional air emission source in the area, due to the proposed facility. Air pollutants released from diesel combustion in trucks are similar to the combustion emissions from ships.

ATASU recommend that the revised air quality assessment includes the additional combustion emissions from trucks using the facility.

2. NOISE AND VIBRATION ASSESSMENT

The EPA has reviewed the '*Marstel Bulk Fuel Facility - Noise and Vibration Impact Assessment*' (NVIA) prepared by AECOM dated 5 August 2011 that forms part of the EA. The EPA has the following comments on the NVIA and EA.

- The ambient noise monitoring results in Section 2.2 of the NVIA are taken from a report prepared by Spectrum Acoustics in 2008, which in turn refers to noise monitoring results from a report prepared by Heggies Australia in 2006. A brief summary of the results is presented in Table 2 of the NVIA, however no noise logger charts or attended noise monitoring results are included. The results of the Spectrum Acoustics report should have been reproduced in the NVIA as they form the basis for the assessment. In order to support and increase confidence in the results presented in Table 2 , they should have been supplemented by other noise monitoring data from other studies undertaken in the locality, and/or from fresh monitoring undertaken by AECOM for this project. In the context of the changing land uses in the locality over time, this would help to establish whether the measured noise levels in Table 2 are still representative of the ambient noise environment in 2011, and the character and contributions of ambient noise sources in the area.

- Table 4 of the NVIA states that the daytime noise management levels are Rating Background Level (RBL) +15 dB. The EPA considers that this should have been the RBL+10 dB.

- NAU notes that construction and operational vibration levels from the site are not expected to raise any issues due to the large distance (900m) to the nearest sensitive receivers.

- The intrusive noise criteria in Table 6 of the NVIA should show an adjusted RBL of 46 dB(A) and intrusive criterion of 51 dB(A) for Mayfield during the evening period, as per the EPA's Industrial

Noise Policy (INP) application note relating to when RBLs for the evening and night are higher than for daytime.

- Table 8 of the NVIA summarising operational noise criteria should also be adjusted as per the point above, and the controlling Project Specific Noise Levels clearly identified.

- Section 4.3.1 of the NVIA states that the 'existing ambient noise levels' in Table 2 (from all sources) exceed the road traffic noise criteria in Table 11. No information regarding the relative levels of road traffic noise versus other ambient noise are provided to support the implicit assumption that the ambient Leq in Table 2 is dominated by road traffic noise. Further information should have been provided to support this assumption prior to applying the 2 dB allowance criterion.

- The NVIA also states in Section 4.3.1 that the proposed access route will generate less than 40 vehicle movements per day from operational activities. This statement is at odds with the adopted vehicle movements of 56 per day in 2012 and 108 movements per day in 2016 quoted in Section 6.6 of the NVIA. The further statement in Section 4.3.1 that 'it is considered unlikely' the proposed <40 operational vehicle movements would exceed the applicable noise criteria on Industrial Drive is clouded by the next statement relating to construction traffic. The traffic noise mitigation and management measures discussed in Section 4.3.1, which purports to relate to criteria, would also have been better placed in Section 7.0. NAU considers that the construction and operational traffic noise criteria and assessment sections should have been reviewed and revised as necessary to clarify traffic criteria, volumes and predicted impacts.

- Section 5.1 of the NVIA states, in the paragraph preceding Table 12, that construction outside standard hours may be undertaken when 'a task is near completion close to 6.00pm...so that the overall construction works can be carried out in minimal time' with the intent to 'shorten the overall length of the noise exposure to nearby receiver locations'. The EPA considers that any out of hours construction works should be subject to the requirements of Section 2.3 of the Interim Construction Noise Guideline.

- Section 5.2.2 of the NVIA identifies two truck movements per hour (22 per day for a 7am – 6pm day) in the construction noise assessment. This figure needs to be reconciled with the <40 vehicles per day in Section 3.3.

- The construction criteria for standard hours in Table 14 of the NVIA should have been reviewed in the light of any revisions to Table 4. Predicted noise levels for any out-of-hours works should also be provided.

- Section 6.1 should have identified the presence or absence of any tonal noise characteristics, and associated INP penalties, for equipment operating at the site.

- Section 6.2.2 adopts a prevailing wind of 3m/s from the north-west as representing a worst case assessment for sensitive receivers at Carrington. No further assessment of prevailing winds is presented. The NVIA should have explained why a prevailing wind from the north-east had not also been adopted as representing a worst case assessment for the closer sensitive receivers at Mayfield.

- The modelled operational scenario for amenity in Section 6.2.3 states two truck movements per hour were included; this should perhaps have been revised to three movements per hour in line with Section 6.1.3.

- Table 19 shows predicted noise levels for a worst case north-west wind as being identical to those in the column for a Class F temperature inversion. The EPA considers this is possibly in error.

- Section 6.4 includes an assessment of a reversing beeper in regard to sleep disturbance impacts. Any penalty associated with tonality should also have been included in this assessment.

- It is unclear if in Table 20, the result for reversing alarms (column 5) also includes the contribution from equipment excluding reversing alarms (column 3). If it does, it is unclear why the reversing alarm result for receivers R9 and R10 are 5 dB and 9 dB lower than the equivalent results excluding reversing alarms.

- It is assumed that the traffic counts for Industrial Drive in Table 23 are AADTs and that the entry for 1998 of 2954 is in error.

- The traffic noise levels in the Spectrum Acoustics report should have been reproduced in the NVIA as part of Table 24 to show existing and predicted (with project) levels.

- The Statement of Commitments relating to noise on Table 44 of the EA contains a rather cryptic entry. The EPA recommends that statement be removed and replaced with a commitment that the noise and vibration mitigation and management strategies detailed in Section 7.0 of the NVIA, as well as the entries in the last paragraph of Section 4.3.1 will be adopted and implemented.

Environment Protection Authority
December 2011