APPENDIX 14

Summary of Issues Raised by Authority Stakeholders

Appendix 14 – Summary of Issues Raised By Authority Stakeholders

Authority Stakeholder	Issues Raised
EPA Service Unit	Noise, both individual facility and cumulative Risk – need to meet EPA risk criteria Flora Odour Air emissions Community consultation in accordance with DoE's Interim Industry Guide to Community Consultation
Department of Environment	Noise Requirement for best practice in relation to conveyor design and operation Risk Dust – baghouse filters required Assessment of vegetation is required under a works approval if no formal assessment has been undertaken by the EPA Address pollution control for fertiliser load-in and load-out Controlling grain spillage to manage pigeons Bunding and containment to Australian Standards
City of Rockingham	Noise Odour Dust Hazard/risk Groundwater contamination Traffic Must address Rockingham Industrial Planning Policy
Town of Kwinana	Odour Waste Hazard/risk Noise Site is zoned for port related industry Must address Kwinana Town Planning Scheme 2 Traffic Cockburn Sound Groundwater Contamination Community benefits Pigeons
Department of Consumer and Employment Protection	Hazard/Risk – plant risk and cumulative risk
Department of Health	Effluent treatment Air quality

Authority Stakeholder	Issues Raised
Department of Indigenous Affairs	Heritage survey required as a part of the Aboriginal heritage component of the report
Department of Industry and Resources	Noise Hazard Flora and fauna Vermin and pigeons

Our Ref: TP-3-67

Your Ref: CRN 220410

Enquiries to: Mr Ron Goodwin

10th October 2006

Ms L Reilly
Environmental Impact Assessment Division
Department of Environment and Conservation
Locked Bag 104
BENTLEY DELIVERY CENTRE WA 6983

Dear Ms Reilly

Re: Proposed Kwinana Ethanol Bio-Refinery

I refer to your letter received on the 25th September 2006 seeking comment on the proposed Kwinana Ethanol Bio-Refinery.

Your letter indicates that the proponent, Primary Energy, has requested that an Environmental Protection Statement (EPS) be set as the level of assessment for the Proposal, and seeks input from stakeholders as part of the initial assessment process. In this regard, a Report prepared by Primary Energy, dated September 2006, is to be considered as a final draft EPS document.

An EPS is the second lowest of five levels of assessment described within the EPA Act Administrative Procedures 2002. The City considers that the requested level of assessment is not acceptable, given the significant scale and potential impacts of the locality. In this regard, the City recommends that the level of assessment be set at Environmental Review and Management Programme.

Background

The City places great emphasis and importance on a vibrant and active Rockingham beachfront area with an aquatic based recreation and tourism lifestyle and, as such, will not support any industrial development that will negatively impact on the quality of this lifestyle.

The proposed Bio-Refinery is located to the north of the CBH Grain Terminal, bounded by Rockingham Beach Road to the west, Kwinana Beach Road to the north and the railway reserve to the east. The site is approximately 24 hectares in area.

The southern boundary of the site is 675 metres from Cee and See Caravan Park.

Detail

The Report outlines several chemical processes involved in the proposed Bio-Refinery:-

1. Grinding and fermentation of 400,000 tonnes of wheat per annum (plus starch, enzymes and yeast,) to produced a 14% ethyl alcohol solution.

2. Distillation of this solution to produce a 95% ethyl alcohol, 5% water solution, known as industrial ethanol. Dehydration agents are then used to produce 99.5% ethyl alcohol, possibly with a denaturant (poison) added to prevent use as a beverage. The Ethanol Plant will also use aqueous ammonia, sulphuric acid, caustic and urea.

3. Anaerobic digestion of waste sludge, (called stillage) to produce methane for use in power plant. (Generation of electricity and steam)

4. Gas fired engine generators to produce 28MW of power, only 5MW to be consumed on site.

5. Further treatment of sludge (drying) and combination with rock phosphate to produce fertiliser.

Comment

The City has reviewed the Report and provides a summary of the key components below in support of its conclusion:-

Air Quality

The Report contains worst-case scenario cumulative air emissions based on Ausplume dispersion modelling and shows significant increases in PM_{10} (particles less than 10 microns) to 48.5ug/m3, an increase of almost 40%, and close to the NEPM maximum for cumulative air emissions of 50ug/m3. Whilst the model results show that the dust concentration is raised dangerously close to this standard, no mitigation measures are stated. Further, no mention is made of total dust concentrations and compared to the maximum permissible within areas A, B, and C of the Kwinana Industrial Area (KIA).

It is also considered that Ausplume provides a relatively basic and outdated dispersion model and does not incorporate the local weather conditions or a sensitivity analysis. A more detailed assessment of air emissions should be undertaken which considers these factors, as well as the potential for compounds from existing industry to combine with emissions from the Bi-Refinery to form new compounds that may impact on the surrounding area.

It should also be noted that the NEPM is a 24-hour average value only. There is little information on the source of particulates, including elevation, on site location and initial particulate concentration or the impact minor process upsets may have on air quality over shorter time spans. These details should also be incorporated into more detailed assessment.

The Document also does not detail any bypass systems to cater for emergency situations that may arise (such as the use of a flare system or gas vents to atmosphere during upset conditions).

The City strongly recommends that a more detailed analysis of air emissions be undertaken, taking into account the various matters raised above.

Odours

The Report suggests the Refinery will generate significant odours but there is no information on the chemical composition of these odours and potential impact on the community.

The Report makes several comments on odours. In the plant description section, comment is made that a water scrubber is incorporated to minimise odour emissions, however, no mention is made of what these odours are and if this method is an affective method for odour removal. NSW EPA literature on odour, associated with fermentation processes, do not list scrubbers as an effective method in the removal of these types of odours. The recommended mitigation methods are: - tall chimneys, carbon absorption and odour masking agents. None of these methods are mentioned within the proposal.

The accepted unit of odour is the Odour Unit. One Odour Unit is defined as the concentration of the odour when 50% of the panel correctly detect the odour. The Report states that odour modelling was carried out using two scenarios, normal operating conditions, with an odour level emission of 250 OU/m^3, and upset conditions of 500 OU/m^3. Both scenarios have the potential to significantly affect the nearby residential land and public spaces.

There is also no indication in the Report of what the odour is and the impact such may have on some members of the community. Further there is no indication of the odour concentration and impact this may have on the adjacent public beaches and CBH workforce.

Concern is also raised that the modelling was carried out to predict 3-minute average events. There is no analysis on the accuracy of the model results or what peak concentrations may be encountered for short time spans of for example 30 seconds.

The Report also fails to provide detail in regard to the number of odour sites, emission height above ground, frequency and intensity of generation. There is also no information on the chemical composition of the odour and the impact on the area outside the plant boundary and on the community in general.

Accordingly, the City considers that odour emissions from the Bio-Refinery have the potential to adversely affect the nearby residential land and public spaces and that an alternative site should be sought that provides a more substantial buffer to these sensitive uses. Should the subject site be further considered, a more detailed analysis of odour emissions should be undertaken.

Noise

Substantial investigation has been carried out in regards to noise generated on site and the impact on North Rockingham using modelling techniques to compare predicted noise levels from existing CBH operations and the addition of the Ethanol Bio- Refinery.

The study concluded that an acoustic barrier is required to lower noise to current levels, however, noise emissions at North Rockingham are in excess of the $L_{10\ 15\ minute}$ Noise Criteria, WA Environmental Protection (Noise) Regulations 1997.

The Report provides no information on the accuracy of the modelling techniques and no comparison with measured noise levels at these sites. There is also no consideration of other existing industries in the study.

Further investigation and other mitigation methods are required to lower noise levels to below present regulation maxima.

Concern is also raised that predicted noise level emissions again leave no margin for error, as they exceed the standard or are at the maximum allowable in some locations. The proposal to install a noise barrier, to alleviate noise at one location, is simplistic and does not address the main concern that noise levels at the industrial boundary do not meet the EPP Noise Regulations. There is no consideration of future multi-level residential developments south of the Cee See Caravan Park for which the noise barrier will have no impact.

Other noise emissions in the area, although minor, are not included in the assessment apart from noise generated by the CBH site.

The noise report considers only L_{A10} levels, however, the assigned levels are stated as L_{A10}, L_{A1} and $L_{A\ max}$ within the regulations. All assigned levels should be discussed within the report. In addition, an important issue raised by residents previously has been low frequency noise that interrupts a person's sleep in the late evening, early morning. This needs to be discussed within the report, as although the plant may achieve compliance with a L_{10} level, it may still cause low frequency type noise that can be detected within the residential area.

The City considers that noise emissions from the Bio-Refinery have the potential to adversely affect the nearby residential land and public spaces and that an alternative site should be sought that provides a more substantial buffer to these sensitive uses. Should the subject site be further considered, a more detailed analysis of noise emissions should be undertaken.

Shadow Effect

The concentration isopleths for odour, particulates and sound are relying upon the shape and size of the CBH Building to lessen the impact upon residents of North Rockingham, a building the proponents have no influence or control over the current or future configuration.

Licensing and Buffer Distances

The Department of Environment and Conservation (DEC) has advised that the proposed Bio-Refinery will, as per Schedule 1 of the Environmental Protection Regulations 1987, fall under Category 31: Chemical Manufacturing, and Category 52: Electric Power Generation.

The Guidance for the Assessment of Environmental Factors – Separation Distances between Industrial and Sensitive Land Uses state: -

1. Electric Power Station, 20MW or more for natural gas a buffer distance of 3000 to 5000 metres is required.

2. Chemical Manufacturing, Organic, and Industrial a buffer distance of 500 to 1500m is required.

The City is concerned that an inappropriate buffer distance is provided from the proposed site to north Rockingham. In addition to the concerns raised earlier, buffer distances are also an important consideration as part of the Risk Assessment of storing large quantities of flammable substances within 675 metres of a residential area.

The City strongly recommends that an alternative site be sought which satisfies the EPA's buffer requirements. Should the subject site be further considered, the City contends that the substantial variation to the EPA's buffer necessitates a high level public assessment through an Environmental Review and Management Plan.

Health Impact Assessment

A Health Impact Assessment should be undertaken which considered the impact the plant, including noise, odour and air emissions, will have on the surrounding residential areas.

Conclusion

In light of the above comments, the City considers that the Report prepared by Primary Energy does not address the buffer requirements as stipulated within EPA Guidelines for power generation plants and organic chemical manufacturing processes and that the construction of this plant is likely to have a significant impact from noise, dust and odour on the North Rockingham community. The size, complexity and intensity of heavy organic industry associated with this project would also indicate a higher level of assessment is required other than that of EPS to accommodate a greater level of scrutiny by interested parties and the public.

Accordingly, the City recommends that serious consideration be given to pursuing an alternative site that provides for a substantial buffer from existing sensitive land uses. Alternatively, a more detailed report should be prepared addressing the matters raised above and the proposal be the subject of an Environmental Review and Management Programme.

Please note, this submission is based on an Officer assessment only, as there has been insufficient time to present this matter to a Council meeting. The matter is being presented to the next meeting of Council to be held on 24th October 2006 and further comments may be submitted after that date, based on the results of the Council's consideration. As such, this submission must be considered as interim only.

Should you have any enquiries with respect to the above advice, please do not hesitate to contact Mr Ron Goodwin on 9528 0448.

Yours faithfully

GARY G HOLLAND
CHIEF EXECUTIVE OFFICER

Umwelt (Australia) Pty Limited
2/20 The Boulevarde
PO Box 838
Toronto NSW 2283

Umwelt
Environmental Consultants

Ph. 02 4950 5322
Fax. 02 4950 5737

ABN 18 059 519 041

18 December 2006

Gary Holland
Chief Executive Officer
City of Rockingham
PO Box 2142
Rockingham DC WA 6967

Dear Gary,

Re: Proposed Kwinana Bio-Refinery - Response to Rockingham City Council Submission

In its submission dated 10 October 2006 to WA EPA Service Unit, Department of Environment and Conservation, Rockingham City Council raised a number of issues in regard to the proposed Ethanol Bio-Refinery as was described in Proposed Kwinana Ethanol Bio-Refinery" (Umwelt September 2006). Since September 2006, further detailed air quality and noise modelling has been undertaken using site specific meteorological data and revised air quality and noise emission levels. A summary of the findings of the revised air quality and noise modelling is provided as **Attachment 1**.

A response to the issues raised in Rockingham City Council's submissions to EPA Service Unit is provided below:

Level of Assessment

Rockingham City Council states in its submission that the proposed level of assessment (Environment Protection Statement (EPS)) is the second lowest of five levels of assessment described in the EPA Act Administrative Procedures 2002 and is not acceptable given the significant scale and potential impacts on the locality. In its submission Council requests that the level of assessment be set at Environmental Review and Management Programme (ERMP).

In regard to the appropriate level of assessment, Section 5.3.1 of Environmental Impact Assessment (Part IV Division 1) Administrative Procedures 2002 states with respect to the EPS level of assessment that:

> This level of assessment will typically be applied to proposals of local interest that raise a number of significant environmental factors that can be readily managed, where it is considered that environmental conditions under Part IV of the Act are required to ensure that the proposal is implemented and managed in an environmentally acceptable manner, and where in the judgement of the Authority, a formal public review period may be unnecessary because the proponent has adequately consulted with stakeholders.

As set out in the "Proposed Kwinana Ethanol Bio-Refinery" (Umwelt September 2006) and the revised air quality and noise assessments summarised in **Attachment 1**, the potential impacts of the proposed Bio-Refinery have been assessed in detail and the potential impacts of the proposed development can be readily managed. These assessments demonstrate that the proposed Bio-Refinery will have a negligible impact on the surrounding area. The findings of the additional air quality and noise modelling will be included in the final of the EPS document. In addition, Primary Energy has made a series of commitments that will form part of the final EPS documentation.

As set out in Section 6.0 of "Proposed Kwinana Ethanol Bio-Refinery" (Umwelt September 2006), extensive consultation has been undertaken with stakeholders and matters raised have been included in the supporting EPS documentation and incorporated into environmental control measures that are to be implemented as part of the proposed Bio-Refinery. Consultation has included several

presentations to and meetings with Rockingham City Council, Town of Kwinana Council, relevant DMAs, North Rockingham residents, Kwinana Industries and Community Forum and local interest groups. In addition a website describing the proposed development has been operational for in excess of 6 months. This website includes a feedback form that provides a mechanism for stakeholders to provide comments and seek clarification in regard to the proposal.

Detailed assessment and consultation with stakeholders has been undertaken for the proposed development. Increasing the level of assessment from EPS to ERMP as suggested by Rockingham City Council, will not require any greater detailed environmental assessment than has already been undertaken as part of the EPS.

Impact on Quality of Beach Lifestyle – The proposed development is set back from the beach with Rockingham Road and a vegetated Recreation Reserve located between the site and the beach and will not impact on the amenity of the beach or the lifestyle of users of the beach. Primary Energy has committed to working with the local community and Rockingham Council to remove rubbish from the reserve and rehabilitate degraded areas of the reserve.

The proposed development is located wholly on industrially zoned land and will generate minimal impacts in regard to visual amenity, air quality, odour or noise.

Air Quality and Odour – Detailed assessment using 24 months of meteorological data representative of the site has been undertaken. This assessment has been third party peer reviewed by Dr Owen Pitts of Air Assessments. The assessment demonstrates that the proposed development will not have any detrimental health impacts on surrounding areas. Predictions indicate that at maximum worst case emission levels there will be no increase at North Rockingham in PM_{10}, SO_2, negligible increase in average annual NOx, CO and VOC concentrations. In terms of odour, worst case scenario modelling indicates that the Bio-Refinery will generate less than 0.1 Odour Units at the 99.9 percentile level at North Rockingham and less than 0.6 Odour Units and at CBH and at the Recreation Reserve adjacent to the site. As set out above, predicted concentrations for all air quality parameters are well below acceptable human health levels.

Noise – Significant noise attenuation measures have been incorporated into all aspects of the proposed Bio-Refinery design. These are discussed further in **Attachment 1**. Detailed noise modelling indicates that the proposed Bio-Refinery will comply with the requirements of the WA Environmental Protection (Noise) Regulation 1997 under worst case meteorological conditions and will not result in a cumulative increase in noise at North Rockingham or any other surrounding residential areas. Construction of an acoustic wall along the southern boundary of CBH, as proposed, will result in an overall reduction in noise levels at North Rockingham with the Bio-Refinery operating when compared to those current noise levels generated by operations at CBH. Noise emissions from train movements on the rail loop will also be reduced though augmentation of the existing noise wall adjacent to the rail loop.

In regard to future multi-level residential developments in North Rockingham, the level of noise control that will be incorporated into the proposed Bio-Refinery is such that the proposed acoustic wall only reduces noise emissions from the Bio-Refinery by 1 to 2 dB(A). As a result the proposed acoustic wall is not relied upon to any great extent to reduce noise impacts from the proposed Bio-Refinery. As a consequence residential development above the height of the acoustic wall will not be exposed to significantly greater noise levels from the Bio-Refinery than at ground level.

Shadow Effect – In terms of shadow effects, the Ausplume model that has been developed to assess air quality impacts does not include the structure of the CBH buildings and effectively assumes that the buildings and structures do not exist. As a result, no reliance is placed on these buildings and structures remaining in place over time or the configuration of these buildings remaining as it currently is. As a consequence any shadowing or masking effects that the buildings may have on air quality and odour have not been taken into consideration in the modelling done for the proposed Bio-Refinery.

Licensing and Buffer Distances – Guidance No. 3 **"**Guidance for the Assessment of Environmental Factors – Separation Distances between Industrial and Sensitive Land Uses (EPA June 2005)" sets out in Appendix 1 generic separation distances between industrial and sensitive land uses.

The generic buffer distance for Chemical Manufacturing industries set out in Appendix 1 of Guidance No. 3 is of 500 metres to 1500 metres from the nearest sensitive receiver. The proposed Bio-Refinery is in excess of 670 metres from North Rockingham Caravan Park and 840 metres from North Rockingham and is therefore consistent with the stated generic buffer distance range. Council in its submission raised concern in regard to the storage of large quantities of flammable substances within 675 metres of a residential area. A site specific risk assessment was undertaken for the proposed Bio-Refinery. As stated in Section 5.7 of "Proposed Kwinana Ethanol Bio-Refinery" (Umwelt September 2006):

> In terms of risk from fire, analysis indicates that the impact on the adjoining recreational reserve or North Rockingham residential area of a fire on site in an ethanol storage tank or a bund fire would be negligible with thermal radiation impacts being restricted to a distance of 80 metres from the fire centre.

The generic buffer distance for an Electric Power Station generating 20 MW or more for natural gas is 3000 metres to 5000 metres. The proposed Bio-Refinery will have the capacity to produce approximately 23 MW of green electricity from the bio-gas that will be produced on the site. Unlike other power stations, the exhaust gases and heat generated from the engines used to generate electricity will be utilised to dry fertiliser. The residual gases from this process will then be subsequently directed to a condenser/knockdown drum/bio-filter system that will remove in excess of 95% of the air pollutants that would have otherwise been vented to the atmosphere. As a result, air emissions from the proposed Bio-Refinery will be very low compared to those from a gas fired power station without similar air quality control measures.

In regard to generic buffer distances, Section 3 of Guidance No. 3 states:

> The distances outlined in Appendix 1 are not intended to be absolute separation distances, rather they are a default distance for the purposes of:
>
> - Identifying the need for specific separation distance or buffer definition studies; and
> - Providing general guidance on separation distances in the **absence** of site specific technical studies.

In regard to buffer definition studies as identified in the first bullet point referred to in the excerpt from Section 3.0, the proposed site has been zoned for general industrial purposes. In regard to the second bullet point, detailed site specific air quality, odour, noise and risk assessments of the proposed Bio-Refinery have been undertaken and demonstrate that the development can be undertaken without having adverse or unacceptable impacts on surrounding sensitive land uses.

Section 4.1 of Guidance No. 3 states:

> Generally, protection of sensitive land uses from industrial emissions is assisted by identification of suitable buffers at the strategic and structural planning stages of the land use planning process, and in the early project formulation stages in the case of individual projects.
>
> A sound site-specific technical analysis will provide the most appropriate guide to the separation distance that should be maintained between a particular industry and sensitive land uses, or between industrial precincts and sensitive land uses, to avoid or minimise conflicts.

Section 4.4.1 of Guidance No. 3 which states:

> Where the separation distance is **less** than the generic distance, a scientific study based on site and industry specific information must be presented to demonstrate that a lesser distance will not result in unacceptable impacts.

Detailed analysis demonstrates that the proposed Bio-Refinery can be constructed on the identified industrially zoned site and operated in a manner that will not adversely impact on surrounding sensitive land uses or the amenity of the surrounding area.

Health Impact – Detailed noise, air quality and odour assessments that have been undertaken for the proposed Bio-Refinery, demonstrate that it can be operated in accordance with relevant health based noise and air quality guidelines. In addition, modelling indicates that the proposed noise control measures will reduce noise levels at North Rockingham from those that are currently experienced and will assist in reducing train noise impacts which was one of the major existing disturbances identified during community consultation with North Rockingham residents.

Conclusion – Detailed analysis of the proposed development using recorded meteorological data that is representative of the site has demonstrated that the proposed Bio-Refinery can be constructed and operated in a manner that has negligible noise, dust and odour impacts on the North Rockingham community and will in fact result in a reduction in noise levels from those currently experienced in the area.

Additional and more detailed air quality and noise modelling that has now been undertaken, has demonstrated that noise, odour and air quality impacts will be significantly less than the very conservative 'worst case' predictions set out in "Proposed Kwinana Ethanol Bio-Refinery" (Umwelt September 2006).

Changing the level of assessment from EPS to ERMP as suggested by Council, will not change the detail of assessment that has been undertaken or the outcomes of the assessment work that has been undertaken.

Please contact either myself or Catherine Pepper on 02 4950 5322 to discuss this matter further and if desired to arrange a suitable time for Primary Energy and Umwelt to meet with Council.

Yours faithfully

Peter Jamieson
Director

Cc: Mayor Barry Sammels

Attachment 1 - Summary of Updated Noise and Air Quality Assessments

Air Quality and Odours

Air quality and odour assessments detailed in "Proposed Kwinana Ethanol Bio-Refinery" (Umwelt September 2006) were based on worst case assessments using very conservative upper limit estimates of air quality and odour emissions.

On 7 December 2006 a revised air quality impact assessment for the proposed Kwinana Bio-Refinery that was prepared by Heggies Australia was forwarded to Lisa Reilly of EPA Service Unit. The assessment used recorded 2004 meteorological data for Woodman Point which is considered to be representative of the proposed Bio-Refinery site. The revised air quality assessment has been subject to a detailed third party peer review that was undertaken by Dr Owen Pitts of Air Assessments.

The revised air quality modelling indicates that at the Caravan Park at North Rockingham, which is the closest 'residential area' to the proposed Bio-Refinery:

- Predicted 99.5th percentile and 99.9th percentile odour concentrations under worst case conditions will be 0.033 Odour Units (OU) and 0.088 OU respectively. As a result odours from the operation of the proposed Bio-Refinery will not be detectable at the Caravan Park or residences in North Rockingham. Guidelines set out in EPA Guidance Statement No 55 state as part of the 'green light' test that if 3 minute average odour concentrations are below 2 OU for the 99.5th percentile and below 4 OU for the 99.9th percentile that no further odour assessment is required. It is apparent that the proposed Bio-Refinery readily complies with these guidelines.

- Predicted maximum 24 hour average PM_{10} contribution from the Bio-Refinery at the Caravan Park and therefore North Rockingham residences is 0 $\mu g/m^3$. Predicted maximum 24 hour average $PM_{2.5}$ contribution from the Bio-Refinery is 0.9 $\mu g/m^3$. The 6th highest 24 hour average PM_{10} concentration at North Rockingham is 34.5 $\mu g/m^3$ with 0 $\mu g/m^3$ contribution from the proposed Bio-Refinery. NEPM air quality goal is 50 $\mu g/m^3$ which is greater than the 6th highest 24 hour average PM_{10} concentration and predicted concentration with the Bio-Refinery plant operating.

- Predicted maximum hourly NOx concentration is 124 $\mu g/m^3$ compared to the NEPM goal of 226 $\mu g/m^3$. The predicted maximum hourly NOx contribution from the proposed Bio-Refinery is 42 $\mu g/m^3$. Predicted annual average NOx concentration at the Caravan Park is 12.9 $\mu g/m^3$ compared to the NEPM goal of 56 $\mu g/m^3$. The predicted annual average NOx contribution from the proposed Bio-Refinery is 0.8 $\mu g/m^3$.

- Predicted maximum hourly SO_2 concentration is 100.9 $\mu g/m^3$ compared to the NEPM goal of 520 $\mu g/m^3$. The predicted maximum hourly SO_2 contribution from the proposed Bio-Refinery is 0 $\mu g/m^3$. Predicted maximum 24 hour average SO_2 concentration at the Caravan Park is 15.3 $\mu g/m^3$ compared to the NEPM goal of 210 $\mu g/m^3$. The predicted maximum 24 hour average SO_2 contribution from the proposed Bio-Refinery is 0.02 $\mu g/m^3$. Predicted annual average SO_2 concentration at the Caravan Park is 1.73 $\mu g/m^3$ compared to the NEPM goal of 52 $\mu g/m^3$. The predicted annual average SO_2 contribution from the proposed Bio-Refinery is 0 $\mu g/m^3$.

- Predicted maximum 8 hour average CO concentration at the Caravan Park is 4.1 mg/m^3 compared to a project goal of 10 mg/m^3. The maximum predicted 8 hour average contribution from the Bio-Refinery is 0.075 mg/m^3.

- Predicted 99.9th percentile 1 hour average VOC (ethanol) concentration at the Caravan Park is 0.06 mg/m^3 compared to a project goal of less than 2.1 mg/m^3. The maximum predicted 8 hour average contribution from the Bio-Refinery is 0.06 mg/m^3.

In conclusion, air quality modelling demonstrates that development and operation of the proposed Bio-Refinery will not have a detrimental health impact upon surrounding sensitive receivers.

Noise

On 28 November 2006 a revised noise impact assessment for the proposed Kwinana Bio-Refinery that was prepared by Heggies Australia was forwarded to Lisa Reilly of EPA Service Unit. In accordance with the provisions of Section 5.5.2(B) of EPA Guidance No. 8, the assessment is based on meteorological data for Woodman Point for the latest available 12 month periods for the years 2003 and 2004. This data has been used to determine representative wind and temperature inversion conditions in accordance with WA Environmental Protection (Noise) Regulations 1997.

Best Practice noise control measures to be incorporated into the proposed development include:

1. A 5 metre high acoustic wall along southern boundary of the proposed Bio-Refinery (Scenario 1). This location provides the greatest noise attenuation at North Rockingham for the Bio-Refinery operations. An alternative to this is to construct a similar 5 metre high wall along the southern side of CBH plant connected to a continuous barrier adjacent to the rail loop (Scenario 2). This alternative location provides the greatest attenuation for the noise emissions at North Rockingham from the CBH plant/Bio-Refinery combined operations;

2. Two 2 metre high acoustic barriers adjacent to the air coolers situated on the roof of the Generator Building;

3. Generator Building and Hammer Mill Building constructed to provide a minimum transmission loss of 30 dB(A);

4. Agitators on digester tanks will be enclosed to provide minimum transmission loss of 10 dB(A);

5. All pumps in digester tank area to be enclosed on three sides.

Table 1 – Predicted Noise Levels - Bio-Refinery Operation Only
Comparing the Performance of Acoustic Wall Scenarios 1 and 2

Meteorological Conditions	Caravan Park			Governor Street			Weld Street		
	Scenario 1 (L_{A10} 15 Minute) (dB(A))	Scenario 2 (L_{A10} 15 Minute) (dB(A))	Criteria (L_{A10} 15 Minute) (dB(A))	Scenario 1 (L_{A10} 15 Minute) (dB(A))	Scenario 2 (L_{A10} 15 Minute) (dB(A))	Criteria (L_{A10} 15 Minute) (dB(A))	Scenario 1 (L_{A10} 15 Minute) (dB(A))	Scenario 2 (L_{A10} 15 Minute) (dB(A))	Criteria (L_{A10} 15 Minute)
Day Calm	20	21	45	28	29	44	25	26	41
Day Worst Case Wind	26	27	45	34	35	44	34	35	41
Night Calm	20	21	35	28	29	34	25	26	31
Night Temp Inversion	21	22	35	29	30	34	27	28	31
Night Worst Case Wind	21	22	35	30	31	34	28	29	31
Night Worst Case Wind and Temp Inversion	22	23	35	31	32	34	30	31	31

As can be seen from **Table 1**, with the proposed noise controls in place, noise emissions from the proposed Bio-Refinery will comply with the requirements of Environmental Protection (Noise) Regulations 1997 for both acoustic wall location scenarios. The analysis shows that Scenario 1 (i.e. acoustic wall at southern end of Bio-Refinery) results in noise levels at North Rockingham being 1 dB(A) lower than for Scenario 2 for all modelled noise conditions. Modelling indicates that both scenarios result in no net cumulative increase in noise levels at North Rockingham as a result of Bio-Refinery operations.

Construction of the acoustic wall on the southern side of CBH (Scenario 2) has the potential to reduce noise levels from CBH as well as from the Bio-Refinery. Modelling was undertaken to explore what

level of noise reductions for CBH operations would be achieved if the wall was constructed along the southern boundary of CBH. The results of this modelling are set out in **Table 2**.

Table 2 – Predicted Noise Levels – Night Time Inversion + North East Wind CBH and Bio-Refinery Operations with Acoustic Wall Scenario 2

Location	Existing CBH Noise Level with no Wall $L_{A10\ (15\ Minute)}$ (dB(A))	Predicted Noise Level $L_{A10\ (15\ Minute)}$ (dB(A))			Night Time Noise Criteria $L_{A10\ (15\ Minute)}$ (dB(A))
		CBH Operations With Wall (L_{A10} 15 Minute) (dB(A))	Bio-Refinery With Wall (L_{A10} 15 Minute) (dB(A))	CBH & Bio-Refinery With Wall (L_{A10} 15 Minute) (dB(A))	
Caravan Park	39	33	23	33	35
Governor Street	41	40	32	41	34
Weld Street	43	40	31	41	31

As can be seen from **Table 2,** modelling indicates that under worst case night time conditions (i.e. north easterly wind and temperature inversion) noise emissions from current CBH operations exceed night time noise criteria in North Rockingham by 4 dB(A) at the Caravan Park, 7 dB(A) at Governor Street and 12 dB(A) at Weld Street.

Modelling indicates that construction of the Scenario 2 acoustic wall along the southern boundary of CBH would reduce noise levels in North Rockingham as a result of CBH operations by 6 dB(A) at the Caravan Park, 1 dB(A) at Governor Street and 3 dB(A) at Weld Street. As set out in **Table 2**, modelling also indicates that with the acoustic wall in place, operation of the proposed Bio-Refinery will result in noise levels that are at or below night time noise criteria. Modelling also indicates that combined noise emissions from the proposed Bio-Refinery and CBH will be less than (at the Caravan Park and Weld Street) or equal (Governor Street) to that of the existing CBH operation.

In summary, with the proposed noise control measures in place, operation of the proposed Bio-Refinery will in its own right not increase noise levels at North Rockingham. The adoption of the Scenario 2 acoustic wall, under worst case meteorological conditions has the potential to reduce existing noise levels at the Caravan Park by 6 dB(A) and at Weld Street by 2 dB(A).

Modelling using daytime default conditions of 20 degrees Celsius, 65 % Relative Humidity and a 3 m/s wind from north east also indicates that extension of the existing noise barrier around the rail loop as is proposed as part of the Scenario 2 acoustic wall, will reduce received noise emissions from trains by 10 dB(A) at the Caravan Park and 11 dB(A) at both Governor Street and Weld Street. Modelling indicates that extension of the existing noise barrier as proposed will be of significant benefit to residents of North Rockingham.

In conclusion, noise modelling indicates that the proposed Bio-Refinery can be constructed and operated without having and adverse or unacceptable impact on the noise amenity of North Rockingham and as such is an appropriate development for the proposed industrially zoned site.

Environmental Protection Authority

The Atrium,
Level 8, 168 St Georges Terrace,
Perth, Western Australia 6000
Telephone: (08) 6364 6500. Facsimile: (08) 6364 6522.

Postal Address: PO Box K822,
Perth, Western Australia 6842.
Website: www.epa.wa.gov.au

copy

Mr Matthew Kelly
Director
Primary Energy Ltd
PO Box 1734
TAMWORTH NSW 2340

Your Ref:
Our Ref: CRN: 220410
Enquiries: Mr Ray Claudius
Telephone: (08) 6467 5404
Email: ray.claudius@dec.wa.gov.au

Dear Mr Kelly

KWINANA ETHANOL BIO-REFINERY

The Environmental Protection Authority (EPA) Service Unit has been informed by the Department of Environment and Conservation (DEC) Air Quality Management Branch that the air quality modelling that has been undertaken for the above proposal is not acceptable for the following reasons:

- The proponent has not provided details of how 24 hour averages were calculated from the screening model;
- Annual concentrations have been provided but it is not clear how they have been calculated from the screening study;
- The proponent needs to provide further detail on how concentrations were calculated for the recreational reserve adjacent to the proposed plant. The report considers the north-west and south-west wind directions to determine impacts on the recreation reserve, but these directions would not impact on the reserve. The current modelling suggests that the maximum concentrations do not meet the green light odour criterion in the recreational reserve; and
- The proponent discusses 99.9th and 99.5th odour concentrations at sensitive receptors. These statistics do not have any meaning if they have been derived from an artificial meteorological data source. The only statistic that can be sensibly used from this screening study is the maximum. In this case if the maximum concentration was less than the 2 odour units (OU) green light criterion, then the impact would be considered to be acceptable. This has not been demonstrated.

In view of the above, the EPA requires that you carry out the air quality modelling again.

Please note that, should the new air quality modelling indicate that ground level concentrations are close to the National Environment Protection Measure standards (especially for PM_{10} particulate emissions), it would not be appropriate for the level of assessment (LOA) to be set at Environmental Protection Statement. In the above case, the EPA would most likely recommend that the LOA be set at public environmental review with a 4 week public review period.

The new air quality modelling would need to be undertaken and/or reviewed by an expert air quality modelling consultant in accordance with the DEC's Air Quality Modelling Guidance Notes and draft EPA Guidance Statement No. 47, particularly with respect to the provision of researched and demonstrated input data.

If you have any queries in regard to the above matter, please contact Ray Claudius on Ph - 6467 5404, in the first instance.

Yours sincerely

Warren Tacey
A/Director
Environmental Impact Assessment Division

16 October 2006

cc: Peter Jamieson, Umwelt (Australia) Pty Ltd