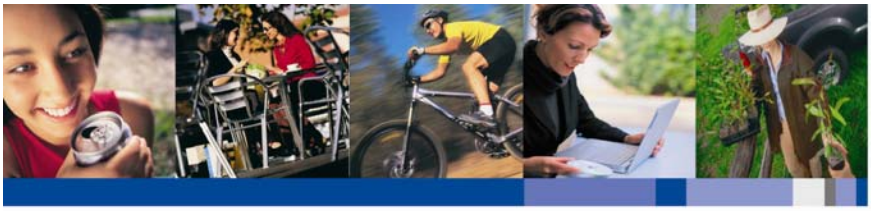


Update number 1
Kwinana Emissions Reduction Project – Liquor Burner – 1 April 2004.

The community consultation and regulatory approval process for Alcoa's Emissions Reduction Project – Liquor Burner started on Thursday, 1 April 2004, with the first meeting of the Stakeholder Reference Group (SRG) for the Project.

The SRG's role is to participate in the community consultation process for the application that Alcoa will submit for the environmental approval of this project. Their task is to assist Alcoa in identifying the community issues to be managed as part of the project.

The group represents Alcoa's main stakeholders and will provide feedback on the planned emission reduction technology to be used to enable the re-commissioning of the Kwinana refinery's liquor burner, which was voluntarily taken offline by the company in May 2002.

Community endorsement is being sought for the technology which is the same as that being installed by Worsley Alumina. The equipment has demonstrated it has the capacity to reduce Kwinana's previous very low liquor burner emission levels significantly.

The overall cost of the project will be A$31 million

SRG members
Emissions Reduction Project – Liquor Burner Project

Fabian Styants	Department of Environment
Steve Hesse	Alcoa Kwinana Community Consultative Network (CCN)
Ray Lees	Alcoa Kwinana Community Consultative Network
Ross Tuckey	Naval Base HolidayVillage
Andy Hacking	Australian Workers Union members at Alcoa Kwinana
Paul Saxton	Australian Metal Workers Union members at Alcoa Kwinana
Ron Kimber	Alcoa Kwinana Community Consultative Network
Rod Pattinson	Councillor, Town of Kwinana
Peter McKenzie	Manager, Environmental Health Services, Town of Kwinana
John Hardy	Principal Environmental Officer, City of Cockburn
Martin Reeves-Fowkes	Councillor, City of Cockburn
Linda Garner	Community Relations Officer, Alcoa Kwinana
Lance Whitewood	Project Team Director Environmental Health and Safety Manager, Alcoa Kwinana
Ron Kemp	Facilitator

The Upgraded Emission Reduction Technology

At the first meeting Lance presented the plans for the new emissions reduction equipment which involves the installation of three new elements to dramatically improve the previous process. He told the group the planned emission reduction system, was the most secure, reliable and the most appropriate available to destroy emissions. It included:

(1) A new six-cell Fine Particulate Filter (known as a 'baghouse' dust collector);
(2) An improved three-stage Scrubber that removes soluble compounds by washing with water sprays from the plant's recycled water circuit, and;
(3) A new Regenerative Thermal Oxidiser (RTO) that destroys volatile organic compounds (VOCs) and odorous compounds, by converting them into carbon dioxide and water through high temperature combustion.

Kwinana Workforce Support

Employee representatives at the meeting said most refinery workers wanted this project to go ahead and were relieved that the refinery had begun working towards bringing the liquor burner back on line. However, employees want the union heavily involved in the monitoring of emissions and they will only accept a safe facility.

Emissions Monitoring and Health Risk Assessment

After the presentation, SRG members raised a series of issues about monitoring of emissions and health risk assessment. Lance suggested that expert consultants could begin to work on these issues and bring preliminary results to the group.

In discussion, group members requested that permanent monitoring be put in place to provide the facts about emissions and to demonstrate improvements.

The Group called for a clarification of issues experienced at Wagerup and suggested a tour of that facility and or Worsley.

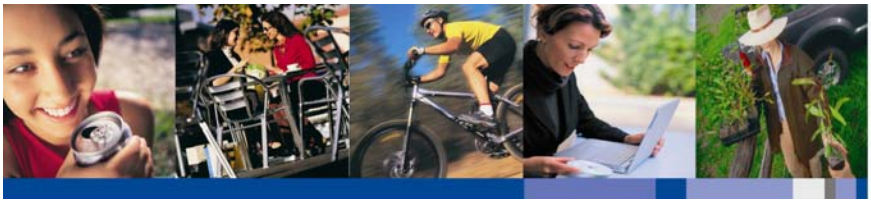
Experts from Alcoa's Project team will be available to the SRG and will be called in when necessary, to provide details on the project.

Expert Review Panel

The SRG will select an independent Expert Review Panel to evaluate emissions modelling and the Health Risk Assessment. Lance will provide a list of potential members for the panel at the next meeting, scheduled for Thursday 15 April 2004.

Further Information

The meeting agreed that Linda Garner – 9410 3171 – 0404 800 403 – should be the point of contact for information about SRG meetings.



Update number 2
Kwinana Emissions Reduction Project – Liquor Burner
15 April 2004.

The second meeting of the Stakeholder Reference Group (SRG) held on the 15th April involved a presentation from Alcoa Environmental Lead Team Leader, Gordon Baird. Gordon explained the benefits of air dispersion modelling, and how this modelling can be used to provide essential information for a Health Risk Assessment (HRA).

Gordon explained, that while air dispersion modelling is effective, it is essential to validate the model with actual test monitoring. This can be difficult as many of the compounds are present in concentrations which are too small to be measured accurately.

Data from the modelling process is then used as the basis for a Health Risk Assessment (HRA). A toxicologist assesses at all the compounds of interest (those known to be harmful to human health), and the average and maximum exposure rates are used to determine the acute and chronic impacts on health.

For this particular HRA, the 'enHealth2002 Risk Assessment Model (enHealth2002) will be used. This document can be found on the web: <http://enhealth.nphp.gov.au/council/pubs/pdf/envhazards.pdf>

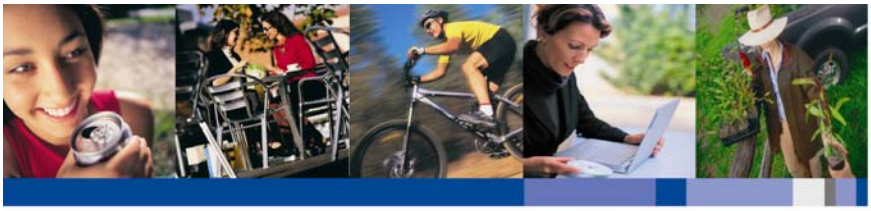
- The HRA:
  - will assess selected high risk locations, not all locations
  - will be delivered in two sections.
    - acute health effects: - which are caused by short term exposure to compounds (uses 1 hour data), and
    - chronic health effects: - which are caused by long term exposure (uses annual data) - in the case of cancer risk evaluation a lifetime of 75 years is used.

Expert Review Panel

The air dispersion modelling report and HRA will be given to experts chosen by the SRG so they can review the documents and offer their professional assessments of the modelling and health risks.

At the SRG meet held on 15 April, those members present were given a list of four people who were deemed by government departments, to be sufficiently qualified and independent of the process to be considered suitable. Availability also reduced the list of names to some degree.

Due to the fact that the State Government is forming a State Government's Environmental Health Foundation to review projects, the group has undertaken to find out who is on the Foundation's review panel, to avoid a possible conflict of interest should this project be part of a government review by the Foundation. This resulted in the discussion and decision around the Independent Expert Review panel was deferred until next meeting, 22 April.



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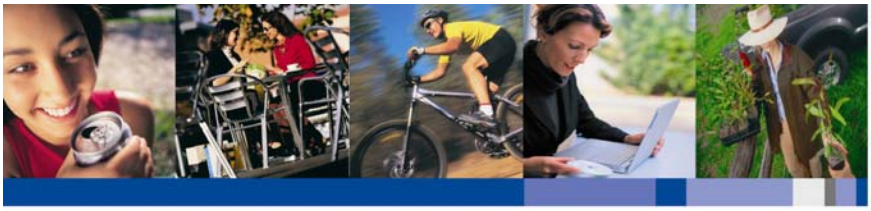
Visit to Worlsey and Wagerup Refineries

A trip to Alcoa's Wagerup Refinery and the Worsley Alumina refinery is being organised for the SRG Members in May to see the emissions reduction equipment in operation. Wagerup has a similar type of emissions control equipment as the Kwinana proposal, but Worsley's emissions reduction equipment is closer to that being proposed for Kwinana. This visit will allow the group to see the equipment in operation and talk to the Worsley people who are operating the plant.

Further Information

The meeting agreed that Linda Garner – 9410 3171 – 0404 800 403 – should be the point of contact for information about SRG meetings.



Update number 3
Kwinana Emissions Reduction Project – Liquor Burner
22 April 2004.

During the third meeting of Alcoa's Stakeholder Reference Group (SRG) looking into Kwinana refinery's emissions reduction equipment for the liquor burner, the group selected the first member of a panel of independent experts who will review the Air Dispersion Modeling work. It was reported to this meeting that the other expert chosen by the group to review the Health Risk Assessment may determine that he has a conflict in another of his roles. It is hoped to have a decision on this by the next meeting being held 29 April.

As part of the consultation process, the independent experts will report back to the SRG after reviewing technical research completed by consultants for Alcoa.

The group chose Dr. Bill Physick to review the Air Dispersion Modeling. Dr Physick is the leader of the Air Quality Modeling and Dispersion Team at CSIRO Atmospheric Research. He will review air dispersion modeling that Alcoa's consultant scientists have already done into the liquor burner, which will be re-commissioned, with upgraded technology.

Dr Physick has been Principal Investigator for eight major Air Quality Modeling studies for Australian government and industry and has participated in a number of others for the minerals and resources industry. His research interests include sea breezes and their role in pollutant dispersion, air quality modeling, and the application of modeling in collaborative work with health researchers.

"Dr Physick's role will be to review the expert research, already done into the expected liquor burner air dispersion, and confirm it is technically correct and make recommendations as appropriate.

As the technology, chosen for the re-commissioning of the Kwinana Liquor Burner, is the same as that used by the Worsley refinery the SRG has arranged to spend a full day visiting the Worsley and Wagerup refineries. This will provide them with the opportunity to view the proposed Kwinana equipment on line at Worsley, and visit Wagerup, which is running similar equipment. A visit has been arranged for the group on 13 May.

During this third meeting, Alcoa Project Leader and Kwinana Environmental Health and Safety manager, Lance Whitewood, gave a short presentation introducing the group members to air dispersion modelling techniques and processes preparing the group for next week's very detailed presentation on the Air Dispersion Model completed for this project.

The Stakeholder Reference Group (SRG) for Alcoa's Emissions Reduction Project – Liquor Burner is the main stakeholder and community consultation forum for discussion, and to get feedback on the Project, which is important for the long-term future of the Kwinana Refinery and its 1,200 employees and contractors.
The SRG's focus is the planned use of the best available emission reduction technology to enable the re-commissioning of the Kwinana refinery's liquor burner, voluntarily taken offline by Alcoa in May 2002. A guarantee was given then, that the liquor burner would not be re-commissioned until further emission reduction technology was installed.
Community endorsement is being sought for the installation of new emissions reduction technology. The equipment is similar to that installed by Worsley Alumina. The technology has already demonstrated it could further reduce Kwinana's previous low liquor burner emission levels by more than 90 per cent.

It is the Air Dispersion Modelling report produced by Dr. Owen Pitt, that will be sent to Dr. Bill Physick for his independent, and expert review. Once Dr Physick has completed review the SRG will be provided with his report and recommendations. It is expected that Dr Physick's report will be received towards the end of May.

The expert selected by the SRG to review the Health Risk Assessment, has been on leave for several weeks, so the engagement of this position has not been resolved but will be pursued, and hopefully resolved in the near future.

The Stakeholder Reference Group (SRG) for Alcoa's Emissions Reduction Project – Liquor Burner is the main stakeholder and community consultation forum for discussion, and to get feedback on the Project, which is important for the long-term future of the Kwinana Refinery and its 1,200 employees and contractors.
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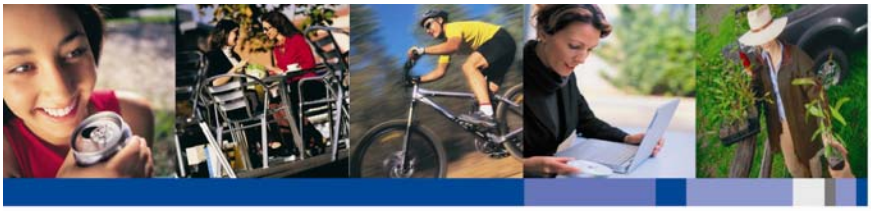

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Update 4
Kwinana Emissions Reduction Project – Liquor Burner
29 April 2004.
Stakeholder Reference Group

The fourth meeting of the Stakeholder Reference Group (SRG) for the Emissions Reduction Project – Liquor Burner began with discussions on the media attention that the Kwinana refinery had received during the day in the West Australian newspaper, and on talk back radio.

The SRG members were given background information on the Healthwise study, a letter from Dr Malcolm Sims, (Chief Investigator for Healthwise, and Head - Unit of Occupational and Environmental Health Department of Epidemiology and Preventative Medicine Monash University) clarifiying what he described as, "some misleading comments," in Dr Harper's report, and a copy of the Alcoa media statement released during the day regarding the report. SRG members asked to be given a briefing on the Healthwise study, requesting that one of the researchers come and speak to them at their next meeting. As the next SRG meeting scheduled for 13 May, is a site visit to Worsley and Wagerup, the Healthwise presentation will be arranged for Thursday 20 May, the first possible meeting date.

Issues Register.
As the group has gained a better understanding of this project over the last four meetings, the Issues Register created at the first SRG meeting was reviewed to see if there were any issues that needed to be expanded upon, or added to the register.

As some of the preliminary work is still to be done, no additional items were added to the register, however, in response to a request, an expected date of completion will be added to each item, to give the issues some priority and order.

Air Dispersion Model.
Alcoa Environmental Engineer, Patrick Coffey presented the major areas of study, carried out in the Air Dispersion Model completed by Dr.Owen Pitts of Sinclair Knights Merz (SKM) as Dr Pitts unavailble to present the report.

Patrick explained that the Air Disperion Model selected for the liquor burner project was called, "Calpuff," but the modeller had also used two other models, AUSPLUME and TAPM to test the modelling, confirm the selection of Calpuff as the most suitable model overall, and verify the models accuracy.

Patrick also explained that modelling is not applicable within the refinery as it is much more difficult to predict local conditions. Monitoring is the preferred method used to determine emission levels close to a source.

Expert Review Panel.
At the last SRG meeting the members selected Dr Bill Physick as the independent expert to review the Air Dispersion Model. Since that meeting Dr Physick has accepted the appointment to undertake this review.

It is the Air Dispersion Modelling report produced by Dr. Owen Pitt, that will be sent to Dr. Bill Physick for his independent, and expert review. Once Dr Physick has completed review the SRG will be provided with his report and recommendations. It is expected that Dr Physick's report will be received towards the end of May.

The expert selected by the SRG to review the Health Risk Assessment, has been on leave for several weeks, so the engagement of this position has not been resolved but will be pursued, and hopefully resolved in the near future.

The Stakeholder Reference Group (SRG) for Alcoa's Emissions Reduction Project – Liquor Burner is the main stakeholder and community consultation forum for discussion, and to get feedback on the Project, which is important for the long-term future of the Kwinana Refinery and its 1,200 employees and contractors.
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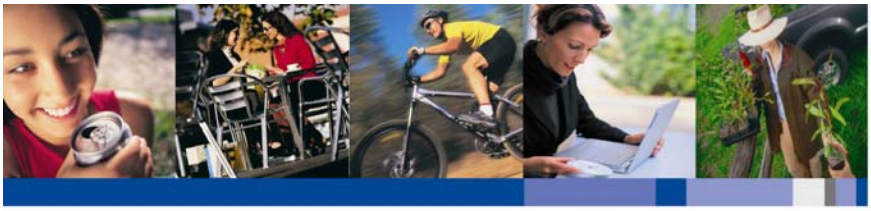
Community endorsement is being sought for the installation of new emissions reduction technology. The equipment is similar to that installed by Worsley Alumina. The technology has already demonstrated it could further reduce Kwinana's previous low liquor burner emission levels by more than 90 per cent.



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Update Number 5
Kwinana Emissions Reduction Project – Liquor Burner
27 May 2004
Stakeholder Reference Group

The fifth meeting of the Stakeholder Reference Group (SRG) for the Emissions Reduction Project – Liquor Burner began with discussions on the recent media attention to a report by Dr. Harper, the He*al*thwise study and the letter from Dr. Malcolm Sim (Chief Investigator for He*al*thwise, and Head-Unit of Occupational and Environmental Health Department of Epidemiology and Prevantative Medicine, Monash University).

It was confirmed that Dr. Harper's report had not used standardised statistical measures, unlike the data contained in the He*al*thwise report, prepared by Dr. Sim. The reason for this was because Dr. Harper did not have the appropriate data, and he has acknowledged this in his report. The He*al*thwise Study data will be updated to 2002 and Dr Sim has confirmed they will continue to standardised measures.

Air Dispersion Model Report
A copy of Dr Bill Physick's review of the air dispersion model report will be provided at the next meeting on 10 June.

Health Risk Assessment
The SRG members are concerned about potential conflict of interest issues in relation to the appointment of members to the expert review panel, and will ensure there are no conflicts of interest on the panel. The SRG will review CV's of candidates before the next meeting.

A copy of Roger Drew's preliminary report on the screening health risk assessment for the liquor burner is planned to be provided to the SRG before the meeting of 10 June.

Environmental Referral
Fabian Styants confirmed the level of assessment for the project had been set by the DoE as informal review, with public advice given. The project also requires a works approval and/or licence. An advertisement has been placed in the West Australian and there is a 10 day appeals process, with a deadline of 8 June.

Issues Register
The SRG acknowledged there may be community interest in broader issues of cumulative health risks from Kwinana industry chemical emmissions and this issue has been added to the Issues Register. The SRG confirmed this broader issue is beyond the scope of the current project.

Works Approval Application
A copy of the draft application will be distributed to the SRG before the meeting of 10 June.

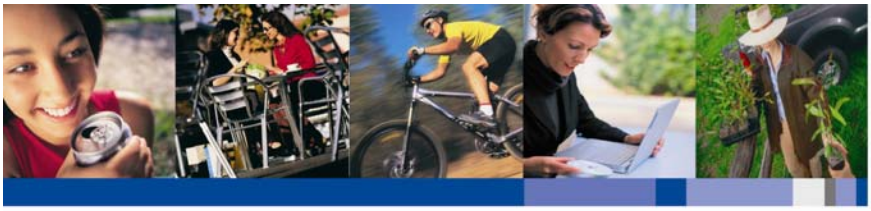
He*al*thwise study
The SRG will invite a He*al*thwise representative along with Alcoa's Occupational Physician, Dr Michael Donoghue, to its next meeting on 10 June, to discuss the He*al*thwise study.

Petition
The SRG was informed that a petition is currently circulating in the Kwinana/Rockingham community, opposing the liquor burner coming back on-line. The petition is being coordinated by the Alumina Widows and Workers Action Group, the Kwinana Progress Association, the Hope Valley Progress Association, the Kwinana Air Buffer Zone Group and the Conservation of Rockingham/Kwinana Environment.

Worsley/Wagerup Visit
On Thursday 3 June, the SRG will make a site visit to Worsley and Wagerup. The next meeting will be on Thursday 10 June.

The Stakeholder Reference Group (SRG) for Alcoa's Emissions Reduction Project – Liquor Burner is the main stakeholder and community consultation forum for discussion, and to get feedback on the Project, which is important for the long-term future of the Kwinana Refinery and its 1,200 employees and contractors.
The SRG's focus is the planned use of the best available emission reduction technology to enable the re-commissioning of the Kwinana refinery's liquor burner, voluntarily taken offline by Alcoa in May 2002. A guarantee was given then, that the liquor burner would not be re-commissioned until further emission reduction technology was installed.

Community endorsement is being sought for the installation of new emissions reduction technology. The equipment is similar to that installed by Worsley Alumina. The technology has already demonstrated it could further reduce Kwinana's previous low liquor burner emission levels by more than 90 per cent.



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Update Number 6
Kwinana Emissions Reduction Project – Liquor Burner
10 June 2004
Stakeholder Reference Group

The sixth meeting of the Stakeholder Reference Group (SRG) for the Emissions Reduction Project – Liquor Burner was held following the group's tour of the Alcoa Wagerup refinery last week.

The group made the following comments regarding the tour:

- The group agreed the tour was of significant benefit and useful to them in their role as SRG members and gave them a better understanding of the project, the liquor burner processes and design and technology issues.
- Information provided was frank and given openly and the SRG took the opportunity to ask questions of the design and operations team.
- It was regrettable that the plant was offline on the day of the visit, however, the plant will be online during a future visit to Worsley's plant, to be arranged in the near future.

Standard Expert Review Contract

A copy of a standard expert review contract was presented to the SRG for their comment. Lance Whitewood confirmed expert reviews are typically desktop reviews of the processes Alcoa undertakes, where experts inform Alcoa if the final report is adequate for its intended purpose. Issues reviewed by experts include, but are not limited to:

- Assumptions and what underpins those assumptions
- How data is collected and analysed, eg for noise, odour etc
- Techniques and evaluation methods used
- Use of appropriate models and their application for the task

The SRG will continue to have the opportunity to scrutinise Alcoa's technical reports and reports from the expert review panels.

Air Dispersion Model – Expert Feedback

The Air Dispersion Model report received expert feedback from Bill Physick at CSIRO Atmospheric Research dated June 2004. The SRG has a number of questions regarding the expert review report and will seek clarification from Mr Physick, who is expected to be present at the next SRG meeting. Questions and queries to Alcoa at the meeting included:

Q. Regarding Alcoa Kwinana's emissions data, is that data for normal operating levels, or are they related to periods when operations are ramped up?
A. Lance Whitewood confirmed there is no opportunity to ramp up operations with the proposed liquor burner technology, and therefore no increase in capability is possible with this project. The range of emissions data is narrow, due to the fact that every time a measure is taken it is not exactly the same as the one taken before it.

CALPUFF is considered by experts to be the best model to use and it appears Bill Physick is saying that if the Health Risk outcomes are too close to health limits, the model should be revalidated. This point will be clarified with Bill Physick.

Health Risk Assessment

- Lance Whitewood confirmed that Roger Drew is now not available to undertake his role for the health risk assessment, as he will be overseas. However, Alcoa intends to use Environ for the work, then to present their report to the expert review panel.
- Dr Peter Di Marco's CV was circulated to the group and Dr Di Marco's position as expert reviewer was ratified by the SRG. His CV was considered suitable and the group would have easy access to Dr Di Marco in the event they wish to discuss his reports in future.

Works Approval Application

The Environmental Referral and Draft Works Approval Application documents were circulated to the SRG, who will read through the draft works approval application, which will continually be updated as work progresses. The SRG will spend considerable time at the next meeting discussing the document and asking any questions.

Lance Whitewood confirmed the Works Approval Application is a critical document for the SRG and Alcoa, which will be submitted to the DoE. It will summarise the modelling and health risk assessment work, provide specifics on management targets, details on equipment and accreditation issues, detail any community issues, present the issues register and Alcoa's response to those issues, and should basically include everything involved in the project.

Issues Register

The issues register will be included in the Works Approval Application and record issues from the perspective of the SRG and Alcoa. The group reviewed the issues listed and made the following additions:

- Calibration of equipment for noise, odour etc and accreditation details
- Evaluation and validation of the model regarding emissions

Next meeting

The next meeting will be held on Thursday 17 June at the Kwinana Recquatic Centre.

The Stakeholder Reference Group (SRG) for Alcoa's Emissions Reduction Project – Liquor Burner is the main stakeholder and community consultation forum for discussion, and to get feedback on the Project, which is important for the long-term future of the Kwinana Refinery and its 1,200 employees and contractors.
The SRG's focus is the planned use of the best available emission reduction technology to enable the re-commissioning of the Kwinana refinery's liquor burner, voluntarily taken offline by Alcoa in May 2002. A guarantee was given then, that the liquor burner would not be re-commissioned until further emission reduction technology was installed.

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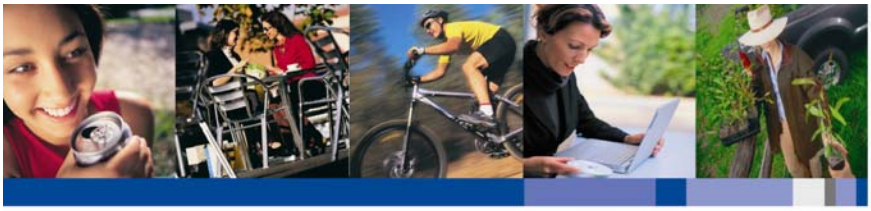

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Update 7
Kwinana Emissions Reduction Project – Liquor Burner
17 June 2004
Stakeholder Reference Group

The focus of the seventh meeting of the Stakeholder Reference Group (SRG) for the Emissions Reduction Project – Liquor Burner was the Air Dispersion Model report and the draft Works Approval Application.

Air Dispersion Model – Expert Feedback

- The SRG have presented their questions and queries to Bill Physick, expert reviewer for the air dispersion model report and a response is expected at next week's meeting.
- Copies of the list of the locations of 13 receptor sites for emissions monitoring in the community was distributed to the SRG. Alcoa has used locations which give a typical representation to allow for assessment of people living and working in the area.
- Alcoa confirmed the Health Risk Assessment will contain information on stack emissions. Questions raised on this point were:
    - Q. Did the previous liquor burner work to the World Health Organisation standards?
    - A. Yes.
    - Q: Does Alcoa have confidence in the new liquor burner technology reducing emissions as compared to the emissions from the previous liquor burner?
    - A: Yes it does. The information we have from Worsley shows over 95% reduction in emissions will be achieved with the new liquor burner technology (RTO).
    - Q: Wouldn't you expect the fallout (of emissions from the stack) for employees to be lower than for residents due to the height of the stack?
    - A: The model can predict fallout and we will be able to look at the data when it comes to hand. We do expect the new technology to reduce emissions by over 95%, which means a significant reduction from the stack, resulting in a significant reduction to employees, and to the community. Alcoa expects the SRG will give its recommendation on a suitable stack height, based on the data.
    - Q: If we want more receptor sites located in the community – can we do that?
    - A: We can still progress with the modelling work as planned, plus we can also add a few more and then run the model again after that if the group believes that is necessary.
        - A member of the group commented that if the current 13 receptor sites adequately represents community exposure, then adding more will not be necessary.
- A comment was made that it appears Alcoa places a lot of faith and confidence in the new liquor burner technology working, and if the modelling - which is very conservative - comes out well, we should be satisfied with that. But if the levels fall short of expectations, then it puts the continuation of the project in question. Alcoa confirmed it is placing its trust in the new technology, based on the information and results achieved by Worsley, who have the new technology in place at their refinery.
- Feedback on a number of clauses in the report was given, which are detailed in the meeting notes.
- Alcoa was asked if it knows what the background levels are for other industry so it can demonstrate the level of any improvement. Alcoa stated that other industry emissions measurement is beyond the scope of this project, which is more specifically concerned with the pre and post emissions data on the liquor burner and achieving a successful outcome. The monitoring will have direct relevance to the Alcoa site, but not to

other Kwinana industry. The Air Toxic 2004 project was mentioned by the SRG, which will give the community and others some base to build on in the future.

SRG Communication and Profiles

- Alcoa acknowledged the role of the SRG and encouraged members to communicate with their stakeholders on the project, and seek feedback and input from interested members of the community.
- A Profile on the SRG members is currently in progress and other communication channels are being reviewed eg website and press. Future distribution of Updates will also be increased.

Health Risk Assessment

- Alcoa confirmed the Worsley report and information has gone to the consultants and work is now in progress and will then be peer reviewed in the US, before going to Dr Peter Di Marco for expert review. A presentation to the SRG would be made as soon as possible.

Draft Works Approval Application - Feedback

- A comment was made that the document may all sound very good, but the community may not believe there will be no problems. Alcoa hope the community will support industry's emission reduction work, as it was a good thing for the community.
- The SRG wish to direct questions on health issues to the Health Department. Alcoa confirmed a meeting with the Health Department tomorrow to give them an update on the project and seek their involvement. At the very minimum Alcoa would like the Health Department to present to the SRG after the Health Risk Assessment is ready and provide answers to any SRG queries on health issues.
- The group endorsed a suggestion to ensure the DoE were represented at each meeting. Alcoa will contact the DoE and seek their ongoing commitment of resources to the project.
- Extensive feedback on the following clauses of the document was provided:
    - Trigger levels for upset or emergency conditions and failsafe measures, currently being analysed
    - PM2.5 dust emissions, currently in progress
    - Standards and appropriate use of data plus specific mention of noise regulations details
    - Use of odour emission reduction data, rather than odour complaints data
- The group would like it noted that the EPA had set the level of assessment for the project, not Alcoa.

Other Discussion

The group agreed that health was the next major issue for the SRG to focus on and they would rely on the Health Dept to provide answers to queries such as the difference between illness and health levels. A comment was made that they need to have faith in the Health Department and the SRG expects them to be helpful to them with this project.

Next meeting

The next meeting will be held on Thursday 17 June at the Kwinana Recquatic Centre.

The Stakeholder Reference Group (SRG) for Alcoa's Emissions Reduction Project – Liquor Burner is the main stakeholder and community consultation forum for discussion, and to get feedback on the Project, which is important for the long-term future of the Kwinana Refinery and its 1,200 employees and contractors.
The SRG's focus is the planned use of the best available emission reduction technology to enable the re-commissioning of the Kwinana refinery's liquor burner, voluntarily taken offline by Alcoa in May 2002. A guarantee was given then, that the liquor burner would not be re-commissioned until further emission reduction technology was installed.

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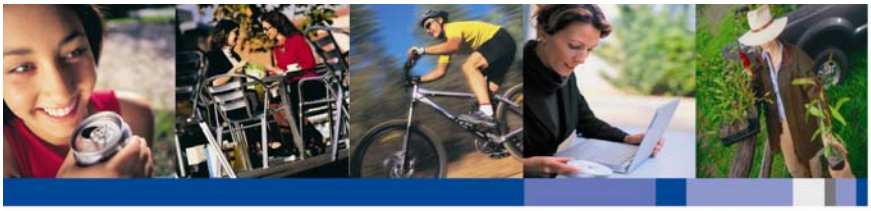

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Update 8
Kwinana Emissions Reductions Project – Liquor Burner
Stakeholder Reference Group - 24 June 2004

The focus of the eighth meeting of the Stakeholder Reference Group (SRG) for the Emissions Reduction Project – Liquor Burner was the Air Dispersion Model report and the Health Risk Assessment.

Health Risk Assessment Experts' Findings to the Stakeholder Reference Group

Environ Australia presented to the SRG on the atmospheric emissions screening assessment, which included details on the screening approach, emissions information, key receptor locations, health protective guidelines, health risk assessment, and findings. Environ Australia's findings for Non-Carcinogenic and Carcinogenic Effects are detailed in the table below:

Non-Carcinogenic Effects (any adverse response to a chemical that does not cause cancer)

Type of Health Risk	What's the Acceptable Range?	Previous Liquor Burner Result	Upgraded Liquor Burner Result	Location Measured	What does this result mean?
Acute Effects = short term exposure to air emissions typically 24 hours or less	Less than 1.0	0.100	0.016	Sayer Rd Hope Valley	**No cause for concern**
	Less than 1.0	0.353	0.066	Rockingham Road, Naval Base	**No cause for concern**
Chronic Effects = long term exposure to air emissions: 24 hrs/day, 365 days/yr over 70yrs, individual standing on doorstep	Less than 1.0	0.152	0.002	Rockingham Road, Naval Base	**No cause for concern**
	Less than 1.0	0.763	0.008	Lionel Street Naval Base	**No cause for concern**

Carcinogenic Effects = exposure to a human carcinogen may increase risk of cancer

Type of Health Risk	What's the Acceptable Range?	Previous Liquor Burner Result	Upgraded Liquor Burner Result	Location Measured	What does this result mean?
Incremental Carcinogenic Risk • Calculated to assess the potential for carcinogenic health effects • Gives an indication of the incremental probability that an individual will develop cancer over a lifetime as a direct result of exposure to potential carcinogens	1 in 1,000,000 to 1 in 10,000	1 in 1,000,000 to 1 in 10,000,000	1 in 100,000,000	Lionel Street, Naval Base	**The potential to cause carcinogenic health effects is very low**
	1 in 1,000,000 to 1 in 10,000	1 in 10,000,000	1 in 100,000,000	Sayer Road, Hope Valley	**The potential to cause carcinogenic health effects is very low**

(Table above prepared by Alcoa Kwinana Refinery using data and information provided by Environ Australia in order to communicate the terms and technical aspects of the report, and what the results mean).

Environ Australia Summary Comment: Health Risk Assessment Findings

- ***"The upgrade to the liquor burner's air pollution control equipment is expected to achieve significant reduction in the hazard indices and incremental carcinogenic risk relative to the original liquor burner's operation."***
- ***"The potential for the upgraded liquor burner emissions to cause acute or chronic non-carcinogenic health effects is very low."***
- ***"The potential for the upgraded liquor burner emissions to contribute significantly to the incidence of cancer is very low."***

Expert Review of Health Risk Assessment Report

A Toxicologist elected by the SRG will undertake an expert review of the Health Risk Assessment report prepared by Environ Australia. The Toxicologist's views will be provided in the next available Update. HRA discussion included:

- The Environ Australia Health Risk Assessment will be subject to peer and expert review.
- Aside from the modelling, some manual monitoring will be performed to verify the air dispersion modelling predictions.
- Regarding validity of the model, Environ confirmed the standard approach used is ultra-conservative and the assumptions around exposure include: exposure is calculated as someone standing at their door breathing in emissions 24 hours per day, 365 days of the year for 70 years.
- Environ stated the model validation is key and that there has been a great deal of modelling work done in Kwinana to demonstrate that the model that has been used is valid, which should give a high level of confidence in the predictions. Environ confirmed the receptor sites are theoretical for the benefit of the modelling work and allow for the prediction of emissions data, as manual monitoring has its limitations in this case.
- Regarding transformation of stack emissions, Environ confirmed the compounds are dispersed very quickly. Temperature is a key factor in energising compounds so it would most likely occur in the RTO.
- Alcoa confirmed that a 12 month maintenance cycle would be in place for the new RTO and its HAZOP study for the project would identify and problem solve any potential hazards.
- Alcoa confirmed the new RTO would reduce by >99% odour, VOC's and carbon monoxide emissions, as achieved at the Worsley refinery, which uses the new RTO technology.
- Alcoa confirmed a noise consultant would be involved in the project once equipment has been identified.

Air Dispersion Model – Expert Feedback

- Alcoa sought and provided all CSIRO responses regarding SRG questions of the expert review report.
- With all queries responded to, Environ Australia presented its Health Risk Assessment report to the SRG.

General

- Alcoa reported back on its meeting with the Health Department, which was given a detailed briefing on the project and agreed to be involved in the review process and provide support to the SRG. Health Department representatives will be visiting the Kwinana refinery next week before attending the next SRG meeting, following their review of the Health Risk Assessment
- On behalf of the SRG, Alcoa successfully sought the ongoing commitment of resources to the project from the Department of Environment.
- The SRG profile and communications are in progress.

Next meeting

Thursday 8 July focussing on the Health Risk Assessment.

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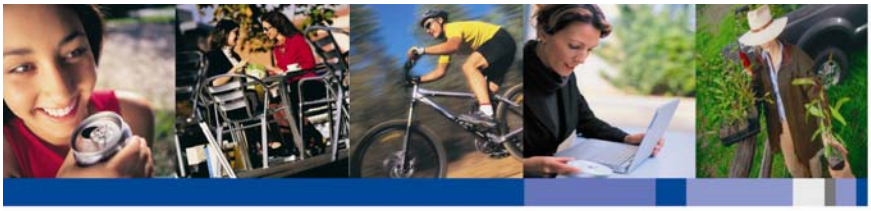

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Update 9
Kwinana Emissions Reduction Project – Liquor Burner
8 July 2004
Stakeholder Reference Group

The meeting focused on Environ Australia's Health Risk Assessment and included a presentation on Alcoa's He*al*thwise study by its Occupational Physician, and information on the Department of Health's future involvement in the project.

Wagerup Liquor Burner Tour

An SRG member was given a tour of Wagerup's liquor burner and noted the following:

- The liquor burner was on line and was not a major noise source at the time, with significant silencing undertaken to reduce low frequency noise
- Could not smell any odour from the liquor burner at the time; surprised how little odour was present at the refinery; winds were not conducive to odour analysis
- Impressed with the site and the tour provided a good insight into the liquor burner emissions reduction project

He*al*thwise Presentation, Michael Donoghue, Alcoa Physician

A presentation on the Alcoa He*al*thwise Study for WA and Victoria operations was provided, focusing on WA. The detailed He*al*thwise report is posted on the Alcoa website for public access. Summary points included:

- The study has independent involvement of Monash University and UWA, eminent international researchers, a scientific advisory board, and the inclusion of AWU, AMWU and Alcoa representatives.
- ***WA /VIC Operations findings:***
  - Alcoa employees have a lower overall risk of death compared to the general population
  - Alcoa employees have a lower overall mortality rate from all causes compared to the general population
  - Alcoa employees have a lower total cancer incidence rate compared to the general population
- ***WA Operations findings:***
  - Alcoa employees have a lower overall risk of death
  - Alcoa employees have a lower mortality rate (circulatory and respiratory disease)
  - Mesothelioma cancer was higher (5 compared to an expected 2), which was expected, based on data and knowledge gained from the previous He*al*thwise study. Data was provided from the WA Mesothelioma cancer registry and in all cases, mesothelioma cancer deaths were related to asbestos exposure prior to work with Alcoa
  - For all other causes of death, the data was the same or lower than the general population
  - Total cancer rates were the same as general population rates
  - Melanoma was increased in all workers compared to the general population rates, which is known to be due to UV sun exposure. The study may simply be detecting the state based increase in melanoma (QLD has highest incidence, followed by WA). Identification of timing of exposure in employees is being investigated, ie childhood, work-related or recreation exposure
  - Increase in thyroid/endocrine gland cancer in office workers only (4 compared to an expected 1), which is being followed up and may or may not be an anomaly.

Discussion

- The SRG understands the study is for Alcoa employees, and was interested in having a study like this for the community. As it is the Department of Health's role to undertake work in community health it was suggested the Department be requested to answer queries about community health in the area.

- There were no significant elevations for the Kwinana refinery compared to others sites in Australia. As the study uses a confidence level of 95% for the data, it is therefore more likely to identify anything negative occurring in relation to employee health. The study also uses a very conservative and standard method.
- In relation to thyroid cancer, the following key points were made:
    - The data on these cancers was restricted to office workers only
    - It is relatively unlikely that the thyroid cancer incidence is related to a workplace exposure issue, otherwise workers other than those in offices would be expected to develop the cancer.
    - For several cancers, there are some causes which may help in follow up, but no causes known for thyroid cancer, other than significant levels of radiation directly to the neck
    - Considering these points together, the finding may not be significant, but Alcoa will investigate further via the He*al*thwise study.

Department of Health involvement in the liquor burner emissions reduction project

- The Department of Health has Environ's Health Risk Assessment report and Dr Di Marco's expert review report and will attend next week's meeting to discuss the report and answer queries.
- The Department of Health will also address the SRG in relation to community health issues, which the SRG are interested in, as well as the liquor burner emissions reduction project.
- The SRG was provided with a copy of the expert review report and will bring comments and questions to the next meeting.
- The SRG is keen to ensure the wellness of the community for those living in proximity to Alcoa operations and will query the Department of Health and Alcoa on those issues. Alcoa understood the group's concerns about community health and believed reviewing employee health data would provide an indication of community health and wellness, as employees have higher short term exposure to the workplace environment than the community.
- One member said he would like to see some consideration given to the positives of the new liquor burner technology regarding improvements in waste management and total refinery emissions including: reduction in caustic soda resulting in improvements to compound levels in residue, a reduction in total refinery emissions and improved control of emissions from the refinery.

Health Risk Assessment – SRG Feedback

The group progressed through each page of the Environ Australia Health Risk Assessment report, asking questions, providing comment and seeking clarification. Alcoa provided answers to most questions and has asked the SRG to refer all other queries to the Toxicologist they elected, Dr Peter Di Marco, at next week's meeting.

Issues Register

The issues list for the project was distributed to the group, to be read and discussed at the next meeting.

Next Meeting

Thursday, 15 July 2004 at the Kwinana Recquatic Centre

The Stakeholder Reference Group (SRG) for Alcoa's Emissions Reduction Project – Liquor Burner is the main stakeholder and community consultation forum for discussion, and to get feedback on the Project, which is important for the long-term future of the Kwinana Refinery and its 1200 employees and contractors.

The SRG's focus is the planned use of the best available emission reduction technology to enable the re-commissioning of the Kwinana refinery's liquor burner, voluntarily taken offline by Alcoa in May 2002. A guarantee was given then, that the liquor burner would not be re-commissioned until further emission reduction technology was installed.

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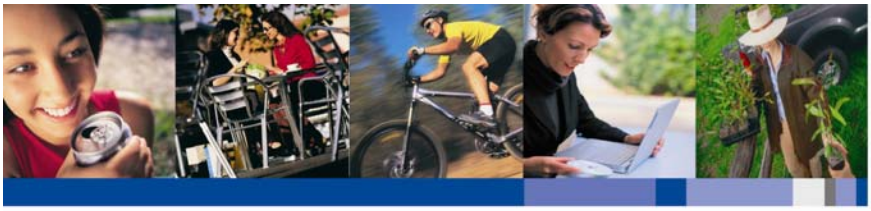

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Update 10
Kwinana Emissions Reduction Project – Liquor Burner
15 July 2004, Stakeholder Reference Group

The tenth meeting of the Stakeholder Reference Group (SRG) focused on the Expert Review of Environ Australia's Health Risk Assessment Report, with presentations from Dr Peter Di Marco of Benchmark Toxicology Services, and Dr Paul Van Buynder of the Department of Health.

Health Risk Assessment – Expert Review, Dr Peter Di Marco

Dr Peter Di Marco, Toxicologist and Principal Consultant of Benchmark Toxicology Services, completed an expert review of the health risk assessment for the upgraded liquor burner. The health risk assessment was undertaken to identify any potential health risks that may result from the upgraded liquor burner being brought back on line. Dr Di Marco made the following findings and comments:

Dr Peter Di Marco, Toxicologist

"The use of the liquor burner in future is highly unlikely to pose any risk of adverse health effects. Benchmark Toxicology Services considers that the outcomes provide sufficient and adequate protection of public health".

"The overall outcome of the health risk assessment is comforting, as the conservative approach results in an overestimation, rather than an underestimation of the potential health risks".

"The overall results indicate no adverse effects and that emission levels from the stack in the upgraded liquor burner scenario will be lower than they were in the past, which were already low and indicate no problem".

"Importantly, the potential impact of the total components of the air emissions is assessed, as well as assessing each component individually. This is consistent with the US Environmental Protection Authority approach – one of the few jurisdictions in the world that has developed guidelines for assessing risks of complex mixtures".

Alcoa welcomed Dr Di Marco's report, and will continue with the emissions work on the project, and implementing Dr Di Marco's emissions monitoring recommendations.

Emissions Monitoring Program

Alcoa has drafted an emissions monitoring program, which will be reviewed by the SRG, and will have input from government, Alcoa employees, the SRG and the community. The monitoring program is necessary in order to confirm the predicted low emissions and to monitor ongoing emission control performance. The monitoring will be conducted in the liquor burner stack, at the Kwinana refinery, and in the community. The program will commence before the liquor burner is commissioned and continue for 12 months.

Anyone interested in more information on the monitoring program can contact the SRG Project Team Leader, Lance Whitewood, on 9410 3564.

Health Risk Assessment - Comment, Dr Paul Van Buynder, Department of Health

Dr Paul Van Buynder is the Principal Medical Consultant, Office of Chief Medical Adviser in the Population Health Division at the Department of Health. Dr Van Buynder was requested by Alcoa to provide its view on the health implications of bring the liquor burner back on line. Comments were being provided to both the SRG and the Appeals Convenor. Dr Van Buynder discussed the liquor burner project and also made comments on community health at the meeting, as follows:

Liquor Burner

- *He had reviewed the air dispersion modeling, the Environ report and Dr Di Marco's review of these documents. He had also reviewed the available gap emissions work in Kwinana.*
- *Some uncertainty exists regarding the precise ground level concentrations and associated community health risks, as each report appropriately identified uncertainties with the techniques used, and Dr Van Buynder had only seen reported emission data in the Health Risk Assessment. Despite this, the modeling showed that there was a very large safety factor. Dr Van Buynder would give his endorsement for the liquor burner to be turned back on, as he did not believe the liquor burner posed a health threat, or that it would contribute significantly to the overall Kwinana airshed, based on the data he has reviewed on the project. If subsequent monitoring shows higher results than those predicted, it is still probably not a big issue in the context of Kwinana industry.*
- *Dr Van Buynder would give his endorsement for the liquor burner to be turned back on, as he did not believe the liquor burner posed a health threat, or that it would contribute significantly to the overall Kwinana airshed, based on data he reviewed on the project. If subsequent monitoring shows higher results than those predicted, it is still probably not a big issue in the context of Kwinana industry.*
- *Dr Van Buynder said that the total Kwinana airshed is the main sphere of influence and is a much more important issue to consider in relation to the amenity and wellness of the community. A reference group like this can't be used for these big issues, the problem is much broader than that."*

Community Health

- *"Industry will remain on the strip as it is a necessary part of the WA economy, however, the community, industry and government could influence the makeup of the airshed if the community believed it caused problems. It's important to make sure the community is okay."*
- *"The failure has been that there is not enough data or information collected to tell the community whether there are or are not any reasons for concern. It is confusing and complex. Ideally, we would have a strategic process in place to collect information, to consider the effects of the airshed, to identify those issues that cause problems, such as odour, noise, dust etc, and work with industry to reduce those particular concerns."*
- *"The Department of Environment is doing work on a gap emissions study and there is a report on cancer coming out soon from the Department of Health, which will be made public and appear on the website."*
- *"I would like to see continual improvement in the Kwinana airshed, as it may reduce some problems believed by the community to be caused by industry emissions. For a broader approach to this higher level issue, agreement is needed between the Department of Health, the Kwinana Industries Council and local government to view the issues together, with advice from the Department of Health.*

Dr Van Buynder was congratulated on his presentation, and for bringing clarity and simplicity to the complex issues being considered by the SRG. He closed by saying the Kwinana airshed issue needed to be looked at strategically, and that local government could start the drive.

Next Meeting

Thursday, 22 July 2004 focussing on the SRG's input to the draft emissions monitoring program and the environmental approval application.

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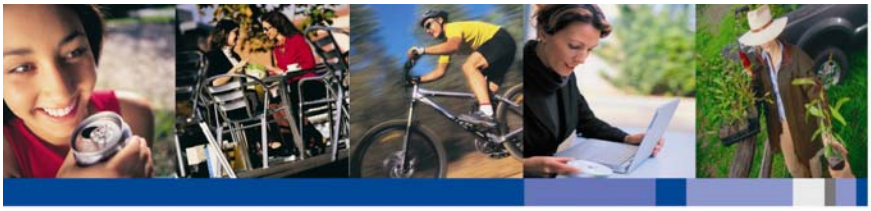

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Update 11
Kwinana Emissions Reduction Project – Liquor Burner
22 July 2004, Stakeholder Reference Group

SRG members discuss the liquor burner project

This week's SRG meeting focused on various aspects of the liquor burner equipment and the Draft Emissions Monitoring Program, presented by Alcoa. Last week's presentation on the findings of the Health Risk Assessment By Toxicologist Dr Peter Di Marco, together with comments made by Dr Paul Van Buynder of the Department of Health, provided the group with excellent background for this meeting.

Dr Di Marco and Dr Van Buynder both endorsed the liquor burner project, with Dr Di Marco stating in his report: *"The use of the liquor burner in future in highly unlikely to pose any risk of adverse health effects....the outcomes provide sufficient and adequate protection of public health"*.

Liquor Burner Equipment

The group was briefed on two key liquor burner equipment issues, being noise and the liquor burner stack height.

Noise

The maximum noise allowed for the liquor burner equipment is 78 decibels (dBA) one metre from the motor (Lance can we compare this with something so readers have a good perspective on what this actually means?). Alcoa must also avoid certain types of noise, in particular high pitched noise of a particular tone.

A noise consultant will conduct a full noise assessment of the liquor burner equipment, commencing in approximately three months. Noise modelling will also be performed off site by noise experts to ensure the liquor burner equipment meets requirements.

Stack Height

SKM consultants have completed an assessment of the potential liquor burner stack heights for the project, assessing heights between 46 and 70 metres. The current stack height and the basis of the Health Risk Assessment is 46 metres. SKM's assessment provided the following information:

- The higher the stack (to 70m), the greater the benefit to the community in terms of dispersion of emissions.
- The greatest benefits to the community are obtained when the stack height is increased from 65 to 70 metres.
- SKM advised the best height for the stack would be somewhere within the range of 46 to 70m.
- The highest emission concentrations were at the refinery, because the highest concentrations will occur when there is no wind.
- The assessment was completed in the geographical area of Sayer Rd in Hope Valley, to the refinery, then north of the Naval Base Holiday Village, and south of the existing liquor burner location.
- The assessment accounted for varying wind conditions at different stack heights.

- Taking the stack height from 46m to 70m, gives a four fold reduction in risk, based on data in the Health Risk Assessment.
- Stack heights higher than 100 metres would mean the need to consider fumigation effects. SKM had suggested a stack height of 70m would not likely present fumigation effects.

Alcoa requested the SRG to decide the height of the liquor burner stack, given SKM's data and comments.

SRG Recommendation

The SRG identified 70 metres as the recommended height of the liquor burner stack.

Kwinana Draft Emissions Monitoring Program

Alcoa presented the Draft Emissions Monitoring Program to the SRG, setting out the monitoring program for three locations: 1) the liquor burner stack; 2) the refinery; and 3) in the community. Alcoa would work with its employees and the community to finalise the program. Key features of the monitoring program include:

- The refinery will have two monitoring sites, to be selected in consultation with employees.
- There will be three monitoring sites in the community, to be identified by the SRG with expert advice from SKM consultants, and in liaison with the Department of Environment.
- Monitoring regimes include: continuous, quarterly, short term and long term sampling.
- Alcoa intends to do a correlation study, to demonstrate that carbon monoxide destruction rates are indicative of the destruction of VOCs, showing that the equipment is running correctly.
- Alcoa confirmed that if the stack monitoring is consistent with data Alcoa already has, they will be satisfied with one very detailed sampling and analysis run. If not, Alcoa will review it again.
- A member commented that there would be some community groups who would not support the project, which is really a way of not supporting industry to reduce its emissions in the Kwinana airshed.

The next meeting is scheduled for 29 July 2004 at the Kwinana Recquatic Centre. The SRG will focus on the Draft Emissions Monitoring Program, the Draft Environmental Approval and the Issues Register.

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