



North West Upgrading Inc.

Application to Construct and Operate an Oil Sands
Upgrader in Sturgeon County

August 7, 2007

ALBERTA ENERGY AND UTILITIES BOARD

Decision 2007-058: North West Upgrading Inc, Application to Construct and Operate an Oil Sands Upgrader in Sturgeon County

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CONTENTS

1	Decision	1
2	Introduction.....	1
	2.1 Application	1
	2.2 Background.....	1
	2.3 Interventions	2
	2.4 Hearing	3
3	Standing and Adjournment Requests.....	3
4	Issues.....	4
5	Public Consultation.....	5
	5.1 Views of North West	5
	5.2 Views of NESICL/CFRD	6
	5.3 Views of the Smiths.....	6
	5.4 Views of the AFN.....	7
	5.5 Views of Edmonton	7
	5.6 Views of the Board.....	7
6	Socioeconomic Effects.....	9
	6.1 Project Benefits	9
	6.1.1 Views of North West	9
	6.1.2 Views of Edmonton	9
	6.1.3 Views of the Board.....	9
	6.2 Regional Planning	9
	6.2.1 Views of North West	9
	6.2.2 Views of Mr. Smulski.....	10
	6.2.3 Views of Edmonton	10
	6.2.4 Views of the Board.....	11
	6.3 Voluntary Property Purchase Program.....	12
	6.3.1 Views of North West	12
	6.3.2 Views of NESICL/CFRD	13
	6.3.3 Views of the Smiths.....	13
	6.3.4 Views of the Board.....	13
	6.4 Transportation.....	14
	6.4.1 Views of North West	14
	6.4.2 Views of NESICL/CFRD	14
	6.4.3 Views of the Board.....	15
7	Site Selection	15
	7.1 Views of North West	15
	7.2 Views of NESICL/CFRD	15
	7.3 Views of the Board.....	16
8	Setbacks	16
	8.1 Views of North West	16
	8.2 Views of NESICL/CFRD	16
	8.3 Views of Mr. Smulski.....	16
	8.4 Views of the Board.....	17

9	Emergency Response Planning.....	17
9.1	Views of North West.....	17
9.2	Views of NESCIL/CFRD.....	18
9.3	Views of the Smiths.....	18
9.4	Views of Mr. Smulski.....	19
9.5	Views of the Board.....	19
10	Air Quality.....	19
10.1	Dispersion Modelling.....	19
10.1.1	Views of North West.....	19
10.1.2	Views of NESCIL/CFRD.....	20
10.1.3	Views of the Board.....	20
10.2	Air Emissions and Ozone Formation.....	21
10.2.1	Views of North West.....	21
10.2.2	Views of NESCIL/CFRD.....	22
10.2.3	Views of the Smiths.....	22
10.2.4	Views of Mr. Smulski.....	22
10.2.5	Views of EC.....	22
10.2.6	Views of the Board.....	23
10.3	Air Monitoring.....	24
10.3.1	Views of North West.....	24
10.3.2	Views of NESCIL/CFRD.....	24
10.3.3	Views of the Board.....	25
10.4	Flaring.....	26
10.4.1	Views of North West.....	26
10.4.2	Views of NESCIL/CFRD.....	26
10.4.3	Views of the Board.....	26
11	Health.....	26
11.1	Views of North West.....	26
11.2	Views of NESCIL/CFRD.....	27
11.3	Views of the Board.....	27
12	Water.....	28
12.1	Water Consumption.....	28
12.1.1	Views of North West.....	28
12.1.2	Views of NESCIL/CFRD.....	29
12.1.3	Views of Edmonton.....	29
12.1.4	Views of the Board.....	29
12.2	Surface Water Drainage.....	30
12.2.1	Views of North West.....	30
12.2.2	Views of Mr. Smulski.....	31
12.2.3	Views of the Board.....	31
12.3	Groundwater.....	31
12.3.1	Views of North West.....	31
12.3.2	Views of Mr. Smulski.....	32
12.3.3	Views of the Board.....	32
13	Technology.....	32
13.1	Sulphur Recovery.....	32

13.1.1	Views of North West	32
13.1.2	Views of NESCIL/CFRD	33
13.1.3	Views of the Smiths.....	34
13.1.4	Views of Mr. Smulski.....	34
13.1.5	Views of Shell	34
13.1.6	Views of the Board.....	34
13.2	Sulphur Blocking.....	35
13.2.1	Views of North West	35
13.2.2	Views of Mr. Smulski.....	35
13.2.3	Views of the Board.....	35
13.3	Gasification.....	36
13.3.1	Views of North West	36
13.3.2	Views of NESCIL/CFRD	36
13.3.3	Views of the Board.....	37
14	Noise	37
14.1	Views of North West	37
14.2	Views of NESCIL/CFRD	38
14.3	Views of Mr. Smulski.....	38
14.4	Views of the Board.....	38
Appendices		
1	Hearing Participants.....	40
2	Summary of Commitments	43
3	Approval Conditions.....	48

ALBERTA ENERGY AND UTILITIES BOARD

Calgary Alberta

NORTH WEST UPGRADING INC. APPLICATION TO CONSTRUCT AND OPERATE AN OIL SANDS UPGRADER IN STURGEON COUNTY

Decision 2007-058
Application No. 1444141

1 DECISION

Having carefully considered all of the evidence, the Alberta Energy and Utilities Board (EUB/Board) finds the project to be in the public interest. Accordingly, the Board is prepared, with the approval of the Lieutenant Governor, to approve Application 1444141, subject to the commitments made by North West Upgrading Inc. (North West) listed in Appendix 2 and subject to the conditions listed in Appendix 3.

2 INTRODUCTION

2.1 Application

On February 1, 2006, North West filed Application No. 1444141 with the EUB and Alberta Environment (AENV) for approval to construct, operate, and reclaim a 23 850 cubic metres per day (m³/d) oil sands bitumen upgrader (North West upgrader project). An environmental impact assessment (EIA) report formed part of Application No. 1444141.

The proposed North West upgrader project would be located in Sturgeon County, about 45 kilometres (km) northeast of Edmonton. The project would be developed in three phases, each processing 12 250 m³/d of bitumen blend containing 7950 m³/d of crude bitumen and producing synthetic crude oil, diluent, and other light hydrocarbon products.

North West also filed a water licence application with AENV, pursuant to the *Water Act*, to authorize

- diversion of water from the North Saskatchewan River,
- site water management plans,
- diversion of an existing water course around the plant site, and
- construction of an intake in the North Saskatchewan River.

2.2 Background

In February 2005, prior to filing its application, North West filed a public disclosure document and proposed terms of reference (TOR) for its EIA. On June 3, 2005, AENV advertised and issued the final EIA TOR for the North West upgrader project.

Following a review of the application, the Board issued a Notice of Hearing on February 27, 2007.

On March 6, 2007, AENV declared that the documents submitted by North West addressed the information requirements set out in Section 49 of the *Environmental Protection and Enhancement Act (EPEA)*. AENV declared that the EIA report was complete, pursuant to Section 53 of the *EPEA*.

2.3 Interventions

Interventions were filed by the Northeast Sturgeon County Industrial Landowners and the Citizens for Responsible Development (NESCIL/CFRD). The members of NESCIL/CFRD consisted of residents within 5 to 10 km of the project site and one former resident who spoke to issues relating to the Voluntary Property Purchase Plan (VPPP). A list of the membership of NESCIL/CFRD is provided in Appendix 1. NESCIL/CFRD cited concerns regarding airshed loading, deficiencies in the EIA, regional air monitoring, health risks to humans and livestock, acidification of soils, noise and light impacts, greenhouse gas emissions, groundwater contamination, water withdrawal from the North Saskatchewan River and the ability of the river to sustain itself, emergency response planning, lack of infrastructure planning, and the rapid pace of industrial development in the region. NESCIL/CFRD opposed the application.

Lyn Smith and Rhonda Smith (the Smiths), whose residence is about 5 km from the project site, filed an intervention citing concerns regarding health risks, the use of best available pollution control technology, the cumulative effects of development in the region, the emission of greenhouse gases, noise, land-use conflicts, impacts on water supplies, traffic and other socioeconomic impacts, by-product and waste disposal, lack of adequate consultation, lack of adequate emergency response plans, and failure to demonstrate that the hazards and risks associated with the project were acceptable. The Smiths opposed the application.

Ken Smulski filed an intervention on behalf of SV Half Diamond Ranch and SV Farms Ltd., citing concerns regarding deficiencies in emergency response planning, restrictions on accessing his lands, surface water drainage, impacts on groundwater and groundwater quality, air emissions, safety, traffic, and noise. Mr. Smulski opposed the application.

The City of Edmonton (Edmonton) filed an intervention citing concerns regarding the socioeconomic impacts of the project and other upgraders proposed for the Edmonton region, the management of water resources, environmental impacts, lack of consultation and planning, and the need for adequate planning to proactively manage the cumulative effects of development in the region. Edmonton supported the application and asked that certain conditions be imposed.

Environment Canada (EC) filed an intervention citing concerns regarding the environmental capacity of the region to handle the cumulative impacts of current and planned upgrader developments, in particular as they related to the formation of ground-level ozone. EC took no position with respect to the application.

The Onoway River Valley Conservation Association (ORVCA) filed an intervention regarding public lands and municipal responsibilities.

Lyn Gorman, on behalf of the Council of Canadians (COC), filed a statement of concern with AENV in April 2006. Ms. Gorman did not file a submission to the hearing but requested, and was granted, an opportunity to address the Board during the proceedings.

The Alexander First Nations (AFN) filed an intervention citing concerns regarding the environmental impacts of the project, as well as concerns regarding consultation. The AFN said that its community and traditional lands were within a 50 km radius of the project site.

The Saddle Lake Cree Nation (SLCN) did not file a submission to the hearing but requested an adjournment of the proceedings in order to be provided with a fair opportunity to present its position.

Five Star Poultry Inc., represented by the Moerman family, and Vermeer Dairies Ltd., represented by the Vermeer family, filed interventions, but withdrew their objections to the application prior to the start of the hearing.

Shell Canada Limited (Shell) filed an intervention and took no position with respect to the application. Shell presented argument relating to sulphur recovery requirements.

Fort Hills Energy L.P. (Fort Hills), Canadian Natural Resources Limited, Agrium Inc. (Agrium), Synenco Energy Inc. (Synenco), and Total E&P Canada Ltd. filed interventions. They took no position with respect to the application but reserved their right to cross-examine and present argument at the hearing.

The Town of Morinville, the Town of Redwater, the Town of Legal, the Town of Gibbons, the Town of Bon Accord, the Sturgeon Economic Development Board, the Legal & District Chamber of Commerce, Sturgeon County, and the Alberta Industrial Heartland Association (AIHA) filed letters in support of the application.

2.4 Hearing

The Board held a public hearing in Redwater, Alberta, which commenced on May 1, 2007, and concluded on May 10, 2007, before Board Member J. D. Dilay, P.Eng. (Presiding Member) and Acting Board Members W. A. Warren, P.Eng., and D. K. Boyler, P.Eng. The Board considers that the record was completed on May 10, 2007.

Those who appeared at the hearing are listed in Appendix 1.

3 STANDING AND ADJOURNMENT REQUESTS

In identifying who may participate at a public hearing, the Board is governed by Section 26 of the *Energy Resources Conservation Act*, which provides that those persons whose rights may be directly and adversely affected by the Board's decision on any energy development are entitled to an opportunity to lead evidence, cross-examine, and give argument—in short, full participation at a hearing, or “standing.” Others who may not be able to meet the “standing” test are not afforded those participation rights by the statute. It has long been a practice of the Board to allow those persons who would otherwise not have standing to participate to some extent at a public hearing provided they offer relevant information. However, funding to cover costs is not available to persons who may participate but do not have standing.

At the hearing, the Board made a number of procedural rulings regarding the issues of standing and hearing adjournment requests, as described in the paragraphs below.

On the basis of correspondence filed after the submission deadline, the AFN and the SLCN made preliminary motions requesting that the Board grant them intervener status and an adjournment prior to the completion of the public hearing to allow them the opportunity to analyze the application material before presenting to the Board.

The AFN stated that it was not raising any constitutional issues in its submission. Although the SLCN indicated that it intended to raise constitutional issues, it acknowledged that it had not provided the notice required under Section 12 of the *Administrative Procedures and Jurisdiction Act*. Justice Canada and Alberta Justice submitted that without appropriate notice, the Board should not consider constitutional issues. Given SLCN's acknowledgement, the Board determined that it did not have jurisdiction to make a decision on questions of constitutional law raised by the SLCN. Further, the Board determined that the AFN and the SLCN had not provided facts to demonstrate that they might be directly and adversely affected by the Board's decision on the North West application. Accordingly, the Board denied standing to the AFN and the SLCN and their adjournment requests.

Similarly, on the basis of interventions filed by the ORVCA and the COC, the Board found that these parties had not demonstrated that they may be directly and adversely affected by the Board's decision on this application. Accordingly, they were denied standing.

However, the Board granted the opportunity to all parties not granted standing to make a statement. These parties included the AFN, the COC, the ORVCA, and the SLCN. All of these parties, with the exception of the SLCN, chose to make a statement.

4 ISSUES

The Board notes that no concerns were expressed by any participants with respect to the need for the North West upgrader project. The Board acknowledges Alberta's strategy for value-added resource development in Alberta and the role that the project could play in that strategy. Therefore, the Board is satisfied that there is a need for the project.

The Board finds that it must make determinations with respect to the following issues that arose during the course of the proceeding:

- public consultation
- socioeconomic effects
 - project benefits
 - regional planning
 - VPPP
 - transportation
- site selection
- setbacks
- emergency response planning
- air quality

- dispersion modelling
- air emissions and ozone formation
- air monitoring
- flaring
- health
- water
 - water consumption
 - surface water drainage
 - groundwater
- technology
 - sulphur recovery
 - sulphur blocking
 - gasification
- noise

5 PUBLIC CONSULTATION

5.1 Views of North West

North West stated that it began its consultation program in February 2005, prior to finalizing the project design and the EIA, in order to gather stakeholder input, identify concerns, and provide the public with early notice of its proposed upgrader. North West stated that its approach was consistent with EUB *Directive 023: Guidelines Respecting an Application for a Commercial Crude Bitumen Recovery and Upgrading Project* and the EIA TOR.

North West stated that its public consultation program included industry groups, local cities, towns, and municipalities, one-on-one meetings with residents, mail-outs, telephone calls, and e-mails. North West's direct mail out-list consisted of over 250 residents and other contacts. North West held two public open houses to exchange information and understand public concerns. North West had direct contact with all residents within a 5 km radius of the proposed site and with those residents beyond that distance who requested direct communication. In addition, North West's application was available on its Web site and at local libraries. North West also opened an office in Redwater to be more available to the public and to provide information. North West distributed a health questionnaire to residents of Sturgeon and Strathcona Counties who lived in the vicinity of the proposed upgrader. The questionnaire included a form for residents to ask for additional information or request a meeting with the health assessment team.

North West noted that applications for upgrader projects were submitted in accordance with *Directive 023* and not *Directive 056: Energy Development Applications and Schedules*. Nonetheless, North West submitted that it had met or exceeded the requirements of *Directive 056*, as it had personally consulted with all residents within 1.6 km of the site and had notified all

residents and landowners within a 5 km radius of the site, which exceeded the project's emergency planning zone (EPZ) of 850 m.

North West noted that as some of the stakeholder concerns were not specific to its project, they were not within its ability to resolve. Issues were raised regarding government policy, the need for new regulatory requirements, municipal land-use planning, and road and other civil and social infrastructure requirements to support all the anticipated development. North West committed to participate with other stakeholders, residents, industry, and governments in the region to understand the issues and seek solutions.

With respect to NESICL/CFRD, North West believed that their members were fully engaged in the public consultation process through personal visits, mail-outs, questionnaires, and open houses.

With respect to the Smiths, North West noted that their residence was more than 5 km from the northeast fence line of the proposed project and that the Agrium facility and the proposed Synenco facility were between its project and the Smiths. North West further noted that the Smiths attended an open house and received mail updates on the project. North West believed that the Smiths had multiple opportunities to participate in the public consultation process. North West submitted that the Smiths had raised only general concerns related to development in the area, but had not raised any concerns about how the proposed project would specifically impact their interests.

North West submitted that it had initiated consultation with Edmonton and that it had committed to continue consultation with Edmonton and other stakeholders. As a result, North West believed that Edmonton's proposed condition that North West be required to initiate and participate in ongoing consultation with it and other stakeholders was unnecessary.

5.2 Views of NESICL/CFRD

A number of the NESICL/CFRD members attended North West's open houses and participated in personal consultation, but said that they were not satisfied with the answers North West provided to address their concerns. NESICL/CFRD believed that they had done everything they could to resolve their concerns prior to coming to the Board.

NESICL/CFRD expressed concerns about the amount of personal unpaid time they spent reading information and participating in stakeholder and synergy meetings to ensure their concerns were acknowledged and acted on. They stated that development was occurring so quickly that it was consuming their lives just to keep informed.

5.3 Views of the Smiths

The Smiths argued that because the North West upgrader was an energy development, North West should be required to meet *Directive 056* requirements. They noted that *Directive 056* applied to other less complex and less intrusive energy facilities in the province. They stated that it would be unreasonable for the Board to apply anything less than the public involvement requirements of *Directive 056* to this application.

The Smiths submitted that North West did not meet the intent of *Directive 056* in terms of consultation and providing project information in a format that allowed participants to clearly understand the details of the proposed development. They understood that the overarching purpose of *Directive 056* was to ensure that the public was made aware of the hazards and risks to their health and property and to allow them to bring their concerns to the applicant or to the EUB if they could not be resolved.

The Smiths stated that North West did not consult with them appropriately. The Smiths were frustrated with North West's lack of response to their questions regarding the proposed project. They also stated that they were unsure of the effects the project would have on their health, air quality, and water quality.

5.4 Views of the AFN

The AFN stated that North West did not properly consult with it. The AFN noted that according to North West, the proposed project would impact an area with a 50 km radius from the project site. The AFN stated that their community and its traditional lands fell within this impacted area.

The AFN argued that proper consultation by North West required it to first assess AFN traditional lands and traditional land uses in the impacted area and, secondly, to assess the project impacts on the lands and their uses. The AFN noted that such an assessment would require extensive research and mapping to determine specific project impacts.

The AFN stated that North West did not follow the AFN consultation policy and also that North West's consultation did not meet the EUB's requirements in *Directive 023*. It argued that the application did not address the potential direct and adverse effects of the proposed project on the AFN community or its lands.

The AFN requested that the Board condition North West's approval to require North West to fund a traditional land-use study and to fund experts to review and assess the application on its behalf.

5.5 Views of Edmonton

Edmonton acknowledged that it could have taken better advantage of North West's consultation process and indicated that it would be reviewing its own consultation procedures for subsequent applications. Edmonton stated that it had embarked on a communication plan with North West and others to discuss concerns and initiatives to bring about some orderly consideration of the impacts of the project and other regional developments.

Edmonton requested that the Board condition North West's approval to require North West to initiate and participate on a regular basis in ongoing consultation with the city and other municipalities in the Edmonton region with respect to issues relating to the project.

5.6 Views of the Board

The Board considers North West's participant involvement program to be extensive. North West was proactive in its approach to involve the public at the early stages of project development and included both those potentially affected by the proposed project and others who expressed an

interest in the project. The Board does not require consultation to result in the resolution of all concerns; rather it expects that legitimate and well-intentioned efforts are made to that end. Also, the Board does not require that the participant involvement program involve those who are a significant distance from the project and are not impacted by the project. The Board concludes that North West has met and exceeded the Board's public consultation requirements.

The Board notes that a number of the hearing participants are located more than 5 km from the proposed project. The Board notes that North West did engage these parties and provided them opportunities to ask questions and obtain information.

The Board also notes that North West has committed to continue to dialogue with all parties, including Edmonton; therefore, the Board does not believe that Edmonton's proposed approval condition is necessary.

As discussed in Section 3, the Board concludes that the AFN did not provide facts to demonstrate that it might be directly and adversely affected by the Board's decision on the North West application. As a result, the Board does not believe that the AFN's proposed approval conditions are necessary.

A number of parties questioned whether North West's public involvement process met the requirements of *Directive 056*. The Board notes that *Directive 056* applies directly to oil and gas energy projects and not oil sands upgraders. As previously noted in *Decision 2006-112*,¹ the Board considers the basic elements for public consultation in *Directive 056* to be the minimum public participation standards that mineable oil sand applicants must meet. The Board also considers *Directive 056* to be the minimum requirement for an oil sands upgrader; therefore, it expects an applicant for an oil sands upgrader to meet the consultation and notification requirements specified for category E facilities in *Directive 056*, Table 5.1. The Board is satisfied that North West has met these requirements. If other information, such as the EIA, indicates that parties outside the minimum distances required for category E facilities could be impacted, the Board expects that they would be part of the applicant's public consultation program as well.

The Board appreciates the concerns of some of the interveners that it can be an onerous task for stakeholders to review large and complex upgrader applications. The Board also recognizes that it can be a challenge for the applicant to present the application information and conclusions in an easy-to-understand format. The Board believes that future upgrader applicants, after filing of the application, should provide the public with additional opportunities to ask questions and obtain more information to better understand these projects. This could include further open houses where the application information is provided in a more user friendly format and where there is an opportunity for questions and feedback on how stakeholder concerns will be addressed.

¹ *Decision 2006-112: Application for Expansion of an Oil Sands Mine (North Steepbank Extension) and a Bitumen Upgrading Facility (Voyageur Upgrader) in the Fort McMurray Area*, November 14, 2006.

6 SOCIOECONOMIC EFFECTS

6.1 Project Benefits

6.1.1 Views of North West

North West submitted that its upgrader project represented a significant investment in Canada and Alberta. North West estimated the project's capital investment at \$4.5 billion. North West expected to pay almost \$4 billion in provincial taxes, \$11 billion in federal taxes, and \$600 million in property taxes to Sturgeon County over a 25-year period. North West stated that the project would employ up to 300 full-time operations and maintenance personnel and that wages, salaries, and expenditures on materials, supplies, and other services would inject tens of millions of dollars into the local economy on an annual basis.

North West stated that it would process bitumen and heavy oil on a fee-for-service basis. Its upgrading fee would be economically attractive and would facilitate participation by producers. It would provide producers with an option to participate in the value chain and allow them to move beyond only exporting low-value material via pipeline for value capture by others.

6.1.2 Views of Edmonton

Edmonton acknowledged the potential economic benefits that the growth in upgrading capacity in the Alberta Industrial Heartland (AIH) offered to both the region and the province. Edmonton indicated that the region could see an economic benefit of as much as \$40 billion if all the growth occurred. However, it also stated that North West's upgrader project would add to the cumulative negative socioeconomic impacts in the region because the infrastructure required to service growth could not be delivered in a sustainable way under the current system.

Edmonton indicated that there were clear economic risks if the region did not deliver on the infrastructure required, not only for North West, but also for other upgrading projects that could follow.

6.1.3 Views of the Board

The Board acknowledges the economic benefits associated with an investment in goods and services for the North West project. While the taxes generated by the project will be offset somewhat by the need for governments to invest in new infrastructure and expanded public services, the Board believes that the overall benefits derived from the project will be significant for the region, for Alberta, and for Canada.

6.2 Regional Planning

6.2.1 Views of North West

North West stated that by choosing a site within the Edmonton metropolitan area, the size and strength of the region's economy ensured that any population growth and resulting demands for housing, recreation, social services, police, education, and medical services could be easily absorbed.

North West believed that Edmonton's issues were primarily related to regional infrastructure sharing and fiscal imbalances among municipalities and the need for a regional growth management plan. North West argued that neither it nor the Board had the jurisdiction to implement a regional plan. North West also noted that a number of local municipalities and towns had submitted letters of support to the Board.

North West stated that it did not agree with Edmonton's request to condition its approval. North West argued that the application was appropriately supported by a socioeconomic impact assessment that included a cumulative effects assessment. North West noted that Edmonton had agreed that the socioeconomic impact assessment met the TOR for the EIA. North West also stated that it was already involved in regional cooperation mechanisms, including those led by the Alberta Industrial Heartland Association (AIHA)² and the Alberta Capital Regional Alliance (ACRA).³ In particular, North West noted that it participated on the AIHA common infrastructure initiative.

6.2.2 Views of Mr. Smulski

Mr. Smulski believed that there was very little coordination of activities in the region and suggested that, as a minimum, infrastructure related to all upgrader projects should be coordinated.

6.2.3 Views of Edmonton

Edmonton stated that it was not opposed to the North West upgrader project and supported its approval.

Edmonton believed that inadequate regional consultation, cooperation, and planning could limit development proposed for the region. Edmonton noted that managing the anticipated growth from the North West and other proposed upgraders would require a coordinated planning effort and substantial municipal infrastructure investments. Edmonton stated that it would like to see a regional growth management plan that addressed the cumulative impacts of all industry, including the proposed upgraders. The plan would allow the municipalities to evaluate projects in the context of the economic and social viability of Edmonton and the region as whole.

Edmonton's analysis indicated that over the next five to ten years, proposed industrial investment in the Edmonton region would range from \$30 billion to \$40 billion, with an estimated 500 000 person increase in the population of the Edmonton region by 2026. Edmonton noted that the city was currently facing growth issues, notwithstanding that none of the proposed upgraders had begun construction. Edmonton submitted that development of this magnitude required the

² The AIHA consists of four municipalities, Strathcona County, City of Fort Saskatchewan, Sturgeon County and Lamont County, whose mandate is to ensure that future growth in the region occurs in a coordinated and responsible manner. It is soliciting input from residents, industry, and business on the development of a Complementary Area Structure Plan.

³ The ACRA consists of 23 municipalities in the greater Edmonton area. Its mandate is to share information and network, advocate for the region, provide research on regional issues, provide a forum for stakeholder input on regional issues, and facilitate implementation of regional initiatives.

implementation of Recommendation 29 of the recently released Government of Alberta report *Investing in Our Future: Responding to the Rapid Growth of Oil Sands Development*.⁴

Edmonton stated that it had spoken with other municipalities and the Department of Municipal Affairs to try to bring forward a regional growth management plan that incorporated the 23 municipalities within the Edmonton region. Edmonton believed that Municipal Affairs should lead this collaborative approach and had outlined its proposed approach to the Minister's Council on Municipal Sustainability. Edmonton was hopeful that the council's report would move through the government approval process quickly and be acted on.

Edmonton argued that the North West application did not provide an analysis of how the socioeconomic impacts of North West's upgrader would be easily absorbed by the Edmonton region. It suggested that the cumulative effect of the proposed upgraders for this area would impact transportation, cause a growing infrastructure deficit, increase construction cost, create further labour shortages, and result in an uneven allocation of residential and nonresidential tax assessment growth in the region.

Edmonton understood that the Board was not in position to impose a growth management plan on the region, but it believed that the Board could impose conditions on North West's approval and future upgrader approvals that would help address Edmonton's concerns. Those conditions were as follows:

- North West be required to participate with municipalities in the region, including Edmonton, and with other upgrader proponents to more fully identify the cumulative impacts of upgrader projects with a view to developing and implementing a joint and proactive response to those cumulative impacts.
- North West be required to strengthen its analysis of the socioeconomic concerns identified by Edmonton with a view to providing the Board and the municipalities in the region the benefit of its additional analysis and recommendations for mitigation.

Edmonton recognized that it must rely on government bodies to address public infrastructure and public service impacts in a meaningful and timely manner. Edmonton requested that the Board consider recommending to the province that coordinated action be taken at all levels of government to ensure that the Edmonton region had the ability to service the anticipated level of sustained growth in the region. Edmonton stated that there was a need for a regional growth management plan and a regional planning initiative.

6.2.4 Views of the Board

The Board agrees with Edmonton that the region would benefit from a regional management plan; it also believes that this is the opportune time to develop such a plan. The Board believes that having the necessary infrastructure in place to accommodate growth will minimize the impacts on the region, further enhance the region as a place for industry and workers to locate, and allow the region to continue to attract and sustain industrial investment. However, the Board

⁴ "Recommendation 29: Alberta Infrastructure and Transportation should immediately join with the respective municipalities and industry to develop a comprehensive transportation and utility plan for the Industrial Heartland including identification of any needed funding. This needs to be done on an urgent basis." Final report prepared by the Oil Sands Ministerial Strategy Committee, December 29, 2006, page 143.

does not believe that it has the mandate to direct that a regional management plan be developed. It believes this responsibility rests with the appropriate government bodies.

The Board notes that efforts to coordinate development are already evident in this region. The AIHA is a good example of four municipalities working closely together and across municipal boundaries. The ACRA is another collaborative mechanism active in the area that is working towards reducing industrial impacts across the region. In the Board's view, a broader regional planning approach is necessary. The Board understands that Municipal Affairs has already identified the need for a regional growth management plan in this area in a report that was submitted to government.

Given the anticipated level of growth, the Board believes that the municipalities in the region should not have to rely on the filing of an application to obtain the information on cumulative effects that they need for regional planning purposes. The Board recognizes that for regional planning to take place, there must be sharing of information between industry and stakeholders, research on regional issues, and communication among stakeholders. The Board encourages industries that are active in the area to collaborate on providing a common source of information on the cumulative socioeconomic effects of development in the region. The information should be updated on a regular basis and made available to the planning authorities in the region. The Board does not take a position on how this information would be best collected and made public.

The Board is satisfied that the socioeconomic impact assessment provided in the application is complete for the purposes of evaluating North West's application and does not believe Edmonton's requested conditions are necessary.

6.3 Voluntary Property Purchase Program

6.3.1 Views of North West

North West stated that it was a founding member and a committed financial supporter of the AIHA. North West noted that the AIHA was the catalyst for the VPPP. It explained that the VPPP was structured and run purposely at arm's length from industry to ensure that any property purchases were considered in the interests of the general public and distance them from specific industry interests.

North West committed to continue to participate in and provide financial support to the VPPP. North West viewed the VPPP as an important means of addressing the concerns of landowners who were significantly impacted by industrial expansion. North West believed that the VPPP would continue to evolve as more projects were approved and more funding became available.

North West noted that it had relocated the residents closest to and most impacted by its project and that it did not have any current plans to buy out any more residents in the area. Rather, North West intended to construct the upgrader on land currently zoned for heavy industrial use in accordance with all setback requirements and current regulations.

6.3.2 Views of NESCIL/CFRD

NESCIL/CFRD believed that the VPPP was not effectively addressing the land-use conflict in the area. They expressed concerns that the rules of the VPPP seemed to continuously change and that it was not a transparent program. Their concerns with the VPPP included the following:

- It did not apply to landowners outside the AIH boundary; therefore many landowners did not qualify, even though they may be impacted by the project.
- There was insufficient funding. NESCIL/CFRD noted that the VPPP had not received any provincial funding, and they were uncertain whether the government supported the program. They also noted that industry was not required to provide funding to the VPPP until its project had been approved.
- Landowner's applications were put on hold if they filed a statement of concern or intervened in a project application.
- There were no assurances as to the timelines for buyout or even if a buyout would occur, so landowners were living in a continual state of uncertainty.
- It did not protect landowners whose properties were losing market value due to industrial development.
- There was a lack of communication from the VPPP executive to the landowners.

NESCIL/CFRD stated that in 2006 three out of twenty-four applicants were accepted in the VPPP. Not all NESCIL/CFRD members qualified for the VPPP, because they lived outside the AIH boundary. NESCIL/CFRD requested that no further development be approved until the VPPP limitations were resolved.

6.3.3 Views of the Smiths

The Smiths believed that given the industrial development around their home, they had no choice but to move. They stated that their land value had decreased as a result of all the announcements for industrial development. The Smiths explained that they could not afford to move in the current market because to find an equivalent property where they could maintain their current quality of life in close proximity to Edmonton would require them to go into debt.

The Smiths stated that their land was located within the AIH boundary, but they had not investigated the VPPP option and did not know if they were eligible.

6.3.4 Views of the Board

The Board notes that on the north side of the North Saskatchewan River where North West proposes to locate its facility there is a contiguous block of land that is now owned by industry, with one exception. Therefore, the Board believes that there has been significant success with respect to the purchase of land for industrial purposes, whether by direct purchase or through the VPPP. It further notes NESCIL/CFRD testimony that some residents have used the VPPP, thereby reducing land-use conflicts. The Board believes that the VPPP represents one alternative mechanism for dealing with resident concerns and it strongly encourages residents to fully investigate the VPPP and its application to their individual circumstances.

With regard to the Smiths, the Board notes they have not investigated the VPPP option, but their property is within the AIH. Therefore, the Board believes that the Smiths should investigate the VPPP as one of the options to address their stated view they that must move.

The Board takes no position on how the VPPP is managed. It notes that such a program may not fully address all landowners' concerns. Given the number of upgraders proposed in the region, the Board encourages the VPPP managers to explore administrative flexibility where individual circumstances warrant.

6.4 Transportation

6.4.1 Views of North West

North West concluded that adequate capacity existed in the existing road infrastructure to accommodate traffic associated with its project. It noted that construction of the upgrader in three phases between 2007 and 2015 would reduce the impact on road traffic. North West stated that it would cover the cost for the redesign and installation of any improvements to Highway 643 that would be required at its gate entry points to accommodate safe movement of traffic on and off its site. It committed to planning deliveries of materials for off-peak hours and operating a bus service for construction workers to reduce construction traffic.

North West retained a traffic consultant to work with Alberta Infrastructure and Transportation (AIT) and the County to review the road development permit that would be applied for in the next several months. North West noted that Sturgeon County had reviewed its application to close a portion of Range Road 220 and the County had passed first reading, received Ministerial approval, and was awaiting second and third reading.

North West noted that it was working with other developers, Sturgeon County, and AIT to define the road infrastructure needs to accommodate additional upgrader projects. For example, North West understood that for Opal Road there were two phases of upgrades contemplated. Phase 1, the northbound upgrade, was approved for construction this year and phase 2 was to be completed in 2008.

North West noted that Sturgeon County would soon be releasing a Transportation Master Plan for the Sturgeon region that would, looking forward two decades, consider the cumulative effects of all expected growth and identify transportation upgrades that may be required. North West was confident that the respective governments would fulfill their responsibilities with regard to any necessary road/transportation infrastructure upgrades.

6.4.2 Views of NESICL/CFRD

NESICL/CFRD believed that the roads in the area were already too small and could not handle the existing traffic. They were concerned about increased traffic accidents, spills from trucks hauling dangerous chemicals, and the deterioration of the roads from heavy loads.

NESICL/CFRD believed that a transportation plan was necessary to determine how to handle the increased traffic. They did not believe that concurrent construction of the North West project and the road upgrades was appropriate.

6.4.3 Views of the Board

The Board acknowledges that construction of the North West upgrader will result in increased traffic in the area. The Board believes that this impact is manageable through appropriate planning. The Board acknowledges North West's commitment to pay for the costs of redesign and upgrades of Highway 643 at North West's gate.

The Board recognizes that North West has committed to work with other industrial developers, Sturgeon County, and AIT to help define the transportation needs for the area. The Board understands that Sturgeon County is releasing a Transportation Master Plan for the Sturgeon region and believes this will help address the regional transportation issues prior to further industrial development.

7 SITE SELECTION

7.1 Views of North West

North West stated that it had examined two possible locations for its project, the Regional Municipality of Wood Buffalo and the AIH. It ultimately decided on the AIH as the best location.

North West stated that the project was on lands that had been zoned for heavy industrial use since 1981. The project lands were surrounded by similarly zoned lands. North West noted that the AIH was home to one of Canada's largest concentrations of petroleum, refining, petrochemical, and chemical processors. Proximity to existing industrial development offered opportunities for joint and synergistic development, such as rail transport, product sales, maintenance, and construction services optimization.

North West noted that the location of its proposed upgrader was consistent with Alberta's strategic direction to concentrate heavy industrial development in the AIH so as to support the efficient and economic development of the province's resources.

7.2 Views of NESICL/CFRD

NESICL/CFRD provided Dr. Nkemdirim to speak to a number of issues, including site selection. Dr. Nkemdirim stated that the upgrader would be located in the worst possible location and questioned whether there was no other place to locate the industry. Dr. Nkemdirim noted that the project would be located in the river valley and stated that he had never found a good reason why close to the river was a good place to locate an industry that had the potential of creating problems, even when remedial plans were in place.

NESICL/CFRD member Mr. Groot submitted that the location of the upgrader was not appropriate. Mr. Groot stated that the agricultural land in the area was of very high quality and the combination of a localized microclimate, soil, rainfall, access to markets and availability of trucking allowed the growing of very high-quality seed potatoes. Mr. Groot stated that all these resources were limited to a stretch of soils that bordered the northwest side of the North Saskatchewan River between Edmonton and the Redwater sand hills. NESICL/CFRD argued

that the location of the upgrader was inappropriate given its potential impacts and the proximity of residential properties.

7.3 Views of the Board

The Board notes that North West evaluated two locations for its project, the Regional Municipality of Wood Buffalo and the AIH. The Board understands that the AIH location provides some benefits in its proximity to Edmonton, other industries, and infrastructure. The Board further notes that the site is zoned for heavy industrial use, the regional municipalities have established the area to accommodate and encourage heavy industrial use, and heavy industry is already well established in the area. The Board notes that a number of municipalities filed letters of support for the application. The Board concludes that the location of the proposed project is appropriate and fully compatible with the intended land use of the project site.

The Board notes that Dr, Nkemdirim did not visit the proposed site and did not provide any corroborating evidence to support his opinion that the proposed site for the upgrader was the worst possible location. As a result, the Board did not find Dr. Nkemdirim's views relevant or useful and has given his views no weight in reaching its decision.

8 SETBACKS

8.1 Views of North West

North West submitted that the existing setbacks imposed by the county were appropriate. North West noted that Sturgeon County established and administered the setbacks and that any proposed changes to setback distances should arise through the County's planning process. It also noted that the NESICL/CFRD members were well beyond the current County setbacks.

It was North West's opinion that Mr. Smulski's mobile home was not a residence under Sturgeon County's definition. North West contended that since Mr. Smulski's mobile home was less than 1000 square feet and did not have a permanent foundation, it was not a residence as defined by the County. Therefore, the 457 m setback distance did not apply and there was no conflict arising from the site of the proposed project and Sturgeon County bylaws.

8.2 Views of NESICL/CFRD

NESICL/CFRD noted that Sturgeon County had defined the setback between a single residential dwelling and industry as 457 m. NESICL/CFRD believed that some of their concerns could be addressed through an increased setback distance between industry and residents. As a minimum, increased setbacks would reduce nuisance issues, such as noise and light. They stated that a 7 to 10 km separation distance between an upgrader location and residents would be appropriate.

8.3 Views of Mr. Smulski

Mr. Smulski noted that prior to bylaw amendments the County had defined the separation distance as the distance measured between the nearest residential lot line and the nearest fence line of the heavy industrial users. The bylaw amendment reduced the setback distance by

allowing the setback distances to be measured from the residence to the nearest fence line of the heavy industrial users.

Mr. Smulski stated that he owned a mobile home in the southwest quarter of Section 19, Township 56, Range 21, West of the 4th Meridian, and that the mobile home had water and power and contained three bedrooms to accommodate himself and his employees during farming operations. Mr. Smulski stated that the County bylaw defined an agricultural dwelling as a single detached dwelling or mobile home on a nonpermanent foundation that is to be occupied by a person who is employed full time for at least six months each year in an agricultural or intensive agricultural operation and is located on the farmstead site. Mr. Smulski argued that his mobile home was an agricultural dwelling by this definition and that a 457 m setback distance should apply.

8.4 Views of the Board

The Board notes that land-use planning is the responsibility of the municipalities under the *Municipal Government Act*. The Board believes that the decision as to whether or not Mr. Smulski's mobile home is a residence, requiring a 457 m setback distance pursuant to the bylaw, is the jurisdiction of the County. The Board expects that this project will meet all municipal requirements, including setbacks.

9 EMERGENCY RESPONSE PLANNING

9.1 Views of North West

North West stated that its corporate-level emergency response plan (ERP) was compliant with the requirements in *Directive 071: Emergency Preparedness and Response Requirements for the Upstream Petroleum Industry*. North West explained that it undertook a broad and inclusive consultation program during the preparation of its corporate-level ERP, including personal consultation extending out to a 5 km radius from the centre of the plant site, despite the fact that the project's calculated EPZ was only 850 m.

North West explained that it had taken into account a range of associated hazards, which included explosive-type situations, in determining the EPZ size of 850 m. The results of this hazard analysis indicated that hydrogen sulphide (H₂S) was the predominant hazard that could extend beyond its property boundaries during an incident at its site. North West believed that its corporate-level ERP and associated EPZ were based on an appropriate assessment of the hazards and risks, but stated that it would continue to review and modify its ERP during detailed design if additional risks suggested that changes were warranted.

North West noted that an expert retained on behalf of NESICL/CFRD had reviewed its corporate-level ERP and had raised no material concerns.. North West committed to invite interested members of the community to participate in and observe emergency training exercises.

North West also commented on its membership in Northeast Region Community Awareness and Emergency Response (NRCAER) and stated that it was working with other NRCAER members in the area to integrate its ERP to allow for a cohesive response strategy. North West understood

that its ERP was in accordance with the NRCAER requirements and followed similar ERPs already established in the area.

North West stated that it had engaged a security specialist to review the requirements concerning critical infrastructure and terrorism-type issues, as well as to review the fundamentals of security, such as fencing and cameras. North West stated that it would build a perimeter fence around the entire site at the commencement of construction.

North West noted that it was developing a comprehensive site-specific ERP to support its development permit application to Sturgeon County. North West noted that Sturgeon County land-use bylaws required that the development site comply with all relevant federal and provincial legislation, standards, and guidelines.

9.2 Views of NESCIL/CFRD

NESCIL/CFRD noted that North West had made the following commitments related to emergency response planning:

- prepare a more detailed blast risk assessment and modify its EPZ size if required by the assessment findings,
- consult with landowners to develop and test a detailed site-specific ERP,
- complete a detailed hazard assessment,
- have in place the appropriate number of emergency response operations personnel, and
- ensure that resident communication links with North West's management are maintained.

NESCIL/CFRD requested that these commitments be conditions of North West's approval.

NESCIL/CFRD noted that it had retained an expert to review North West's corporate ERP and that North West had agreed to accommodate many of the issues raised by its expert.

NESCIL/CFRD noted the importance of initiating immediate public notification of any incidents that may affect landowners, including those impacts that may be harmless but could be seen, smelled, or heard by residents off site, as those could be a significant source of anxiety.

NESCIL/CFRD expressed concerns about the existing NRCAER system and that the information line was not being updated appropriately.

NESCIL/CFRD stressed the importance of a call-out system that worked and included a method for notifying landowners who were not by their phones when an emergency occurred.

NESCIL/CFRD members were concerned that they would not be notified in the event of an emergency because their lifestyle placed them outdoors a significant amount of time. They suggested that there were a number of methods North West could adopt to notify landowners away from the phone during an emergency, such as lights or sirens.

9.3 Views of the Smiths

The Smiths did not believe that an 850 m EPZ was appropriate; they believed an explosion would have impacts outside this EPZ. The Smiths argued that there was insufficient information

for the Board to evaluate the safety of the public because North West was still evaluating the hazards and risks associated with the project.

9.4 Views of Mr. Smulski

Mr. Smulski expressed a concern that he or his employees might not be notified during an emergency since they would be working outside. Mr. Smulski believed that his workers' safety was put in further jeopardy with the closure of Range Road 220, an egress route adjacent to North West's property.

9.5 Views of the Board

The Board notes that North West has filed a corporate-level ERP consistent with the emergency response requirements in *Directive 071*. The Board expects that the site-specific ERP that North West has committed to develop prior to start-up will address residents' concerns with regard to notification of people working outside during an emergency. The Board is confident that solutions can be found to ensure that people are notified and notes that NESCIL/CFRD have provided suggestions for notification to those individuals outside of their residences at the time of a potential incident. The Board expects that North West will meet its commitments with respect to its ERP and does not believe these commitments need to be a condition of approval. The Board is satisfied that North West will develop an integrated, effective ERP that will be protective of the public, its employees, and its facility.

The Board notes that North West is a member of NRCAER and that NRCAER provides for the sharing and implementation of best practices for coordinated response to industrial emergencies and natural disasters, focusing on joint emergency response and sharing of resources. The Board believes that participation in NRCAER is an important component of North West's emergency response planning.

The Board acknowledges the concerns expressed by the interveners about the types of incident reported by NRCAER, whether these incidents are harmless or of material consequence. The Board expects that North West will raise the concerns expressed by the interveners with NRCAER and will keep residents apprised of its progress to have their concerns addressed.

10 AIR QUALITY

10.1 Dispersion Modelling

10.1.1 Views of North West

North West stated that the air quality assessment completed for its application followed all the requirements of the AENV Air Quality Model Guideline and the EIA TOR. North West submitted that the emissions inventory, study area size, and modelling approach were sufficient to determine the effects of emissions from the project and other existing, approved, and announced projects on humans and environmental receptors that could be adversely impacted by the project. North West noted that the air quality study predicted no material incremental negative changes to air quality as a result of its upgrader project. North West believed that the inclusion of background air concentrations in the modelling predictions would take into account

emission sources outside the modelling study area. North West submitted that any exceedances of the Alberta Ambient Air Quality Objectives (AAAQO) predicted by modelling were not an indication of North West's contribution to the airshed, as the predicted exceedances were entirely due to existing facilities.

10.1.2 Views of NESCIL/CFRD

NESCIL/CFRD believed that the air modelling completed for the project was not appropriate and that it had numerous deficiencies. NESCIL/CFRD's consultant, Ms. Goodwin, identified a number of issues concerning the modelling and air inventory, including

- the exclusion of a number of regional emissions sources,
- the exclusion of many potential emissions sources and pollutants from the emissions inventory for the project, and
- the non-conformity of the modelling domain with the requirements of the Air Quality Model Guideline.

As a result, NESCIL/CFRD believed that the predicted impacts and health risks to local landowners were underestimated.

NESCIL/CFRD's consultant Dr. Nkemdirim also expressed concerns about the air modeling, identifying apparent deficiencies in the meteorological data, receptor resolution, and background concentrations.

10.1.3 Views of the Board

The Board notes that predictive dispersion modelling is an air quality management tool used to show the potential air quality impacts of a project. The Board finds that North West's modelling approach was appropriate. The Board believes that the air quality assessment was completed in accordance with the AENV Air Quality Model Guideline. The Board notes that AENV declared the EIA complete, indicating that the TOR were satisfied and that the Air Quality Model Guideline was followed.

The Board does not agree with Ms. Goodwin's view that the modelling approach was inappropriate. The Board believes that

- a comprehensive emissions inventory was completed for the air modelling study area and emission sources outside of this area were accounted for by the inclusion of background concentrations in the air modelling predictions;
- North West completed a comprehensive emission inventory for its project, which comprised all emission sources and applicable pollutants, and hence the assessment provided a good understanding of the predicted impacts of the project, along with other projects in the area;
- North West provided evidence that demonstrated that the modelling study area was selected in accordance with the AENV Air Quality Model Guideline; and
- the opinions with regard to air modelling deficiencies given by Ms. Goodwin were refuted by North West.

As a result, the Board did not find Ms. Goodwin's views relevant or useful in this proceeding.

The Board notes that Dr. Nkemdirim did not file any dispersion modelling evidence to support his assertions. Therefore, the Board did not find Dr. Nkemdirim's evidence to be useful or relevant and gave it no weight.

The Board acknowledges that exceedances of the AAAQO were predicted in all air modeling scenarios. However, the Board also notes that the predicted exceedances occur very infrequently at localized non-residential receptors and are not indicative of long-term regional air quality problems at residential locations. The Board understands that the main contributors to the exceedances are existing facilities and the modelling evidence shows that the proposed project does not contribute significantly to the predicted exceedances.

10.2 Air Emissions and Ozone Formation

10.2.1 Views of North West

North West indicated that its objective for the project was to have an integrated suite of technologies that achieved economic, environmental, and operational reliability. North West maintained that it analyzed potential alternatives for all of its major technology choices, having regard for such factors as operating and capital costs, economics, reliability, operability and maintenance, integration with other technologies, regulatory requirements, environmental performance, and safety. By considering all of these factors, North West submitted that it had chosen a combination of technologies that struck the right balance and resulted in a project as a whole that incorporated best-available technology that was economically achievable (BATEA).

With respect to nitrogen oxide (NO_x) emissions, North West stated that the EIA concluded that there would be no adverse impacts associated with the project at the proposed level of NO_x emission control using low-NO_x burners.

North West submitted that it completed a thorough estimate of fugitive emissions from all applicable areas of the proposed facility as part of its air quality assessment. North West disputed the claims of NESCIL/CFRD that a number of process areas and pollutants were not considered in the fugitive emissions assessment. Nevertheless, North West committed to developing a leak detection and repair (LDAR) program consistent with the more stringent of the Canadian Council of the Ministers of the Environment Environmental Code of Practice for the Measurement and Control of Fugitive VOC Emissions from Equipment Leaks (CCME Code of Practice) and the Canadian Association of Petroleum Producers Best Management Practices for the Management of Fugitive Emissions at Upstream Oil and Gas Facilities (CAPP BMP).

North West submitted that there was a potential for short-term off-lease odours to occur from the facility but it did not expect off-lease odours to occur under normal operating conditions.

North West stated that the project's contribution to regional ozone precursor emissions would be insignificant and the potential incremental ozone formation due to the project would be minimal. North West committed to operate within the requirements of any air quality management plan developed for the Edmonton Census Metropolitan Area in accordance with the Clean Air Strategic Alliance Particulate Matter and Ozone (CASA PM/03) Management Framework.

10.2.2 Views of NESICL/CFRD

NESICL/CFRD believed that the Board should require the use of best available demonstrated technology in the design phase of a project, as North West stated that retrofitting at a later date would be difficult. NESICL/CFRD stated that the use of ultra low-NO_x burners for control of NO_x emissions was consistent with BATEA.

NESICL/CFRD's consultant Ms. Goodwin argued that North West had not assessed the fugitive emissions from the project's hydroprocessor, residue hydrocracker, amine recovery unit, gasification unit, sour water stripper, sulphur recovery unit, or cooling towers. Furthermore, Ms. Goodwin argued that many of the fugitive emissions that North West did not account for could lead to a variety of degradation by-products.

NESICL/CFRD stated that there were instances in the field when estimates of fugitive emissions were lower than actual measured values. NESICL/CFRD believed that the LDAR program committed to by North West was not comprehensive enough to manage fugitive emissions and they recommended an annual Spectrasyne⁵ survey.

NESICL/CFRD believed that the impacts of the proposed upgrader's emissions on ozone formation were not assessed and noted that ozone modelling was not required as part of the EIA. NESICL/CFRD put forward a number of recommendations to reduce ozone precursor emissions and for ambient ozone monitoring.

10.2.3 Views of the Smiths

The Smiths' counsel argued that while North West had proposed some state-of-the-art technology in hydrogen production, hydrocracking, and gasification, the areas where best available technology was not being used was in pollution control.

10.2.4 Views of Mr. Smulski

Mr. Smulski stated that although he was a proponent of economic growth, North West's project would not be using the best available technology.

10.2.5 Views of EC

EC noted that AENV was currently preparing the document *Emission Guidelines for Oxides of Nitrogen (NO_x) for New Boilers, Heaters and Turbines Using Gaseous Fuels for the Regional Municipality of Wood Buffalo* based on a review of BATEA. Therefore EC recommended that the results of the AENV NO_x BATEA review be considered in determining NO_x control requirements for North West. EC expressed concern about increased NO_x emissions in the region and their contribution to ozone formation.

EC noted that emissions of some fugitive volatile organic compounds (VOC) could contribute to the formation of ground-level ozone. EC recommended that the Board take into account the recent progress in the United States in improving the performance of leak detection and repair when determining leak detection, repair, inspection, and correction requirements for North West.

⁵ Spectrasyne is a company based in the United Kingdom that operates environmental surveying vehicles that use differential absorption light detection and ranging to estimate emissions from entire facilities or individual sources.

Further, EC recommended that the Board examine the appropriateness of new methodologies for effective leak detection, such as directed inspection and maintenance practice, for North West and other upgraders located in or near urban areas. EC submitted that North West should develop a LDAR program that included the best of both the prescriptive (CCME Code of Practice) and the more holistic (CAPP BMP) approaches to fugitive emissions management.

EC expressed concern about the environmental capacity of the region to handle the cumulative impacts of current and planned upgrader developments in the AIH with respect to ozone formation. EC was also concerned about the speed with which the management plans for addressing ground-level ozone were progressing. EC acknowledged that the Government of Alberta was committed to meeting the Canada-wide standards for ozone in all areas of the province and that ultimately AENV would have the responsibility to ensure that ozone management plans were in place. EC's position was that development and implementation of the ozone management plan be considered in making decisions on the North West application.

10.2.6 Views of the Board

The Board considers that proponents in Alberta need to be aware of reasonably foreseeable changes to current emission standards and guidelines and to recommended pollution control technology. The Board believes that operators need to incorporate flexibility in the design of the plants to facilitate retrofitting of improved controls, should these become necessary or desirable.

With respect to NO_x emissions, the Board acknowledges that North West's proposed technology to control NO_x emissions would meet the current CCME National Emission Guidelines for Commercial/Industrial Boilers and Heaters. The Board understands that AENV is the responsible authority to determine whether North West is using the appropriate technology to control NO_x emissions. The Board expects that AENV will consider the results of its NO_x BATEA studies when determining North West's *EPEA* approval conditions.

The Board believes that fugitive emission assessments are useful to determine potential environmental and health risks. Emissions from proposed point sources for criteria pollutants can be quantified with certainty using emission factors, manufacturer specifications, and mass balances; however, there is far less certainty in the estimation of fugitive emissions. The Board believes that good operational procedures and good fundamental design are the best way to manage fugitive emissions. The Board acknowledges North West's commitment to its LDAR program to meet the more stringent of the CCME Code of Practice and CAPP BMP and expects North West to implement a LDAR program that incorporates the best of both, as suggested by EC. The Board understands that AENV is the responsible authority for establishing the requirements of a LDAR program through its *EPEA* approval and recommends that AENV consider the EC recommendations for an appropriate LDAR program.

The Board acknowledges that off-lease odours could potentially occur from a facility of this nature. North West has committed that off-lease odours should not occur during normal operation. If off-lease odours occur, the Board will require North West to make physical or operational changes to prevent recurrences.

The Board notes that although North West will be a source of NO_x and VOC emissions, its relative contribution to regional ozone precursors is minimal. Although stakeholders involved in the local airsheds are developing an air quality management plan for the Edmonton region in

accordance with the CASA PM/O₃ Management Framework, it is the Board's view that AENV is the responsible authority to ensure that the management plan is developed in a timely manner. The Board notes that North West has committed to operate within the requirements of the air quality management plans and it believes that this is an appropriate regional way of addressing ozone formation.

The Board understands that Ms. Goodwin brought forward similar concerns and issues as evidence in a previous Board hearing in 2006. The Board did not find Ms. Goodwin's views relevant or useful in this proceeding.

The Board notes that neither the Smiths nor Mr. Smulski provided evidence to support their view that North West would not be using BATEA.

10.3 Air Monitoring

10.3.1 Views of North West

North West submitted that it would conduct air quality and in-stack monitoring in accordance with its *EPEA* approval and would support regional air quality monitoring through its participation in the Northeast Capital Industrial Association (NCIA) and its participation in the Fort Air Partnership (FAP). North West believed that input on appropriate regional airshed monitoring should be undertaken through FAP. North West committed to bring the concerns of local area residents about air quality and monitoring to FAP.

North West agreed to EC's recommendation to purchase an ozone monitor for incorporation into the FAP regional air monitoring network. North West stated that it would monitor wind speed and direction at the plant site and committed to provide the data to FAP to incorporate into the regional air monitoring network if the data collected were of a quality that FAP would require.

Through its involvement with the FAP, North West committed to participate in monitoring programs to assess the effects of regional emissions on terrestrial ecosystems and potential soil acidification. North West also committed to respond to any adverse findings and to incorporate appropriate mitigation strategies into its operational practices.

10.3.2 Views of NESCIL/CFRD

NESCIL/CFRD performed air sampling in the region by collecting samples of air over a one-minute duration at a number of locations. After analyzing the air samples, they concluded that the concentrations for some pollutants were comparable to some of the most industrialized areas of the world. They indicated that the analysis of the air samples was done at one the most reputable labs in the world.

NESCIL/CFRD believed that regional monitoring through FAP was ineffective and inadequate. They questioned whether FAP's monitoring was accurate in terms of the calibration of the equipment or the analysis of the results. Therefore, NESCIL/CFRD argued that a more rigorous air monitoring sampling program was needed, as well as additional air sampling sites in the area using analytical techniques proven to be reliable in order to more accurately assess industrial impact on air quality.

NESCIL/CFRD argued that it was not enough for North West to say that its monitoring would comply with AENV's guidelines or the FAP program. NESCIL/CFRD requested that air monitors be installed on their members' properties. The monitors should continuously monitor sulfur dioxide (SO₂), benzene, H₂S, and other carcinogens. They considered these monitors to be important in order to ensure that North West was in compliance with its emission limits, thereby providing residents with peace of mind that their physical health was not in jeopardy. NESCIL/CFRD noted that it was important for pollutants to be tracked to a source so that they could be controlled. NESCIL/CFRD recommended regular sampling of air quality through monitors in a one-mile grid pattern and in a five-mile zone around North West's site.

NESCIL/CFRD expressed concern that the measured exceedances of the 1-hour AAAQO for SO₂ at the Redwater station were an indication of poor air quality in the local area and, since the North West project would be adjacent to this monitor, that local and regional air quality would deteriorate.

10.3.3 Views of the Board

The Board acknowledges that FAP is responsible for monitoring the air quality in the region and is endorsed by CASA. The Board recognizes that the interveners had concerns about the FAP sampling program and analytical techniques. The Board believes that it is in the public interest to ensure that there is confidence in the program that monitors the air quality in the region. As such, the Board expects North West to meet its commitment to bring the interveners' concerns with respect to monitoring to FAP and discuss whether there are any limitations in the current monitoring being undertaken and whether there are ways to improve the current regional monitoring network and increase public confidence.

Review of the application indicates that there is no comprehensive regional monitoring program assessing the affects of regional emissions on terrestrial ecosystems and potential soil acidification. The Board notes the level of industrial activity proposed for the area and recommends that AENV consider implementing such programs, possibly through FAP.

The Board understands that AENV, as the responsible authority, has the expertise to determine the appropriate ambient air quality and stack monitoring requirements for this project, and that these requirements will be part of the *EPEA* approval.

The Board accepts North West's commitment to purchase a continuous ozone monitor and agrees that the placement, operation, and maintenance of this monitor would be the responsibility of FAP. The Board understands that EC will offer advice to FAP on the location of the monitor.

The Board notes that there are currently measured exceedances of the AAAQO at the FAP Redwater air monitoring station, which is adjacent to the proposed North West upgrader. The Board understands that these measured exceedances are due to an existing facility and occur infrequently. Nevertheless, the Board believes that recurring exceedances of the AAAQO can erode public confidence in the regional monitoring network. Therefore, the Board recommends that AENV examine the causes of the measured exceedances and work with stakeholders to address the issue.

10.4 Flaring

10.4.1 Views of North West

North West indicated that under normal circumstances there would be no continuous flaring at the proposed upgrader; however, flaring could occur during nonroutine situations, and it submitted that exceedances of AAAQO could occur during these situations if a flare management plan were not implemented. To address nonroutine situations, North West committed to submit to the Board and AENV an air quality assessment of nonroutine flaring events and a flare management plan to deal with these events. It committed to design its flare systems to be consistent with the requirements of *Directive 060: Upstream Petroleum Industry Flaring, Incinerating, and Venting*.

10.4.2 Views of NESICL/CFRD

NESICL/CFRD had concerns about flaring at the proposed upgrader, but acknowledged that North West's commitment to follow *Directive 060* addressed most of their concerns. NESICL/CFRD submitted that North West should still examine the feasibility of using enclosed burners instead of flares.

10.4.3 Views of the Board

The Board believes that flare systems are an integral and necessary part of the process and safety systems of an upgrader. The Board acknowledges that flaring at the upgrader will occur but believes that it will be infrequent and under nonroutine situations. The Board notes that North West has committed to ensure that all applicable regulations are met during nonroutine flaring. The Board accepts North West's commitment to design its flare systems to be consistent with *Directive 060* and expects North West to minimize flaring under all circumstances.

11 HEALTH

11.1 Views of North West

In its human health risk assessment, North West concluded that the contribution of its project to acute and chronic health risks in the region would be low and that the project's impact on lifetime cancer risks in the health study area would be insignificant.

In response to NESICL/CFRD's assertion that baseline health risks were underestimated, North West stated that the facilities NESICL/CFRD identified as having been excluded from the assessment, such as PetroCanada's Edmonton refinery and Imperial Oil's Strathcona refinery, were outside the defined air modelling study area. North West noted that these facilities were included in the baseline air modelling case by the addition of measured background concentrations to model predictions.

With respect to carcinogens, North West explained that background air concentrations were excluded in order to allow the comparison of incremental (project) cancer risks with the allowable incremental risk level of 1 in 100 000 established by Alberta Health and Wellness (AHW) and Health Canada. North West explained that the contribution of the project to cancer

risks in the health study area would be masked by the much larger contribution of background exposures if background air concentrations were included. North West noted that background cancer exposure risks were affected by background air concentrations and individual lifestyle factors. North West argued that the approach of assessing incremental risk was consistent with Health Canada guidelines, which had been accepted by AHW and AENV.

North West's health risk assessment indicated that the acute and chronic inhalation health risks for certain chemicals (e.g., acrolein, benzene, SO₂, and respiratory irritants) and receptors exceeded the target risk level (a concentration ratio of 1.0) in the baseline, application, and cumulative effects cases. However, differences between the baseline and application risks were minor, indicating a low overall contribution of the project to health risk.

In response to NESICL/CFRD's assertion that a number of respiratory irritants were not assessed, North West noted that the compounds of concern were in fact either included in the baseline assessment or were not present at levels of consequence to human health. North West stated that all relevant respiratory irritants emitted from the proposed project were assessed in addition to those currently being monitored in the health study area.

North West stated that exposure limits were derived so as to be conservative in order to be protective of sensitive individuals, such as those with pre-existing medical conditions, including asthma.

11.2 Views of NESICL/CFRD

NESICL/CFRD suggested that human health risks were underestimated. First, they believed that baseline health risks were underestimated by the exclusion of various emission sources from the baseline emissions assessment. Second, they believed that health risks associated with carcinogens were underestimated by failing to take into account baseline or background levels of carcinogenic exposure. In the latter regard, NESICL/CFRD expressed concern that the project would increase exposure to carcinogens in the study area, where they believed the background cancer risk to be high.

NESICL/CFRD stated that numerous respiratory irritants, including some atmospheric transformation by-products of VOCs, were not identified or assessed. This was a concern, given a reported higher incidence of respiratory complaints in the Fort Saskatchewan region. Other interveners also expressed concern with respect to the effect of the project on residents with asthma and other breathing conditions.

11.3 Views of the Board

The Board recognizes that there is confusion as to how emission sources outside the health study area, such as the Edmonton refineries, were included in the baseline health assessment. The Board finds that the baseline health risks for non-carcinogens were not underestimated because measured background air concentrations in the study area were added to the model to account for other emission sources beyond the study area boundaries. The Board notes that there is conservatism built into the modelling, since the emissions from the facilities in the health study area are included through modelling and again through the addition of measured background air emissions.

With respect to carcinogens, the Board is satisfied that North West's cancer risk assessment approach is consistent with the requirements of Health Canada, AHW, and AENV. The Board accepts North West's evaluation of cancer risk and agrees that project risk should be assessed on an incremental basis. The Board recognizes that background levels of carcinogenic exposure are not relevant, since they are unrelated to the project and would have the effect of masking incremental project risks if they were included.

The Board acknowledges that the predicted background and/or baseline health risks associated with certain chemicals exceed target levels at some receptor locations. The Board understands that these exceedances occur in localized areas under maximum predicted air concentrations. The Board notes that the health risks, expressed in terms of concentrations ratios, do not change significantly for these chemicals between the baseline, application, and cumulative effects cases. Therefore, the Board concludes that the project's contribution to health risks associated with these chemicals is insignificant.

With respect to respiratory irritants, the Board notes that North West has considered in its assessment the chemicals known to be present in the airshed, as well as all those anticipated to be emitted by the project. Other compounds listed by NESICL/CFRD, such as atmospheric transformation by-products, have not been demonstrated by NESICL/CFRD to be present at concentrations that may be of concern. The Board finds that North West's air assessment, on which the health risk assessment was based, is acceptable, and the Board is satisfied that North West has addressed the contaminants of potential concern in the health risk assessment. The Board concludes that the predicted health risks as a result of the proposed project are insignificant.

12 WATER

12.1 Water Consumption

12.1.1 Views of North West

During the hearing, North West testified that it had reduced its water withdrawal from the North Saskatchewan River by 25 per cent, its discharge back to the river by 65 per cent, and its deep well disposal volumes by 86 per cent relative to its original application. North West confirmed that its *Water Act* application would reflect its reduced water withdrawal requirements.

North West explained that about 95 per cent of its project cooling requirements would be met through the use of air coolers rather than water cooling. North West noted that it was conducting an ongoing evaluation of deep-well disposal options and feasibility. The Nisku and Leduc Formations were identified as possible injection formations.

North West stated that it did not examine the use of brackish water as a replacement for river water withdrawals, as the volume of brackish water available in the region was insufficient to meet project needs.

North West stated that it was aware of several private sector and municipal government initiatives within the AIH to develop alternative water supplies, including accessing grey water effluent from regional wastewater treatment plants. Subject to timing and the results of these

initiatives, North West indicated that it was prepared to consider the technical and economic viability of using grey water effluent as an alternative to its own standalone water intake.

12.1.2 Views of NESICL/CFRD

NESICL/CFRD's consultant Dr. Nkemdirim presented an overview of water-related issues. Dr. Nkemdirim noted that North West's water consumption could serve the daily needs of 28 000 Albertans, or the needs of one Albertan for 118 years. Dr. Nkemdirim expressed concern about the possibility that water in the North Saskatchewan River basin was overallocated.

NESICL/CFRD also expressed concern about the amount of water that North West was proposing to withdraw from the North Saskatchewan River and the impacts this would have on groundwater and the ability of the river to sustain itself, given the cumulative impact of such withdrawals.

12.1.3 Views of Edmonton

Edmonton submitted that North West did not adequately address the cumulative impact of water withdrawal from the North Saskatchewan River or the use of recycled water to lessen the cumulative impact.

Edmonton requested that the Board condition North West's approval to require North West to use recycled water to the greatest extent possible and that the Board require North West to evaluate the effectiveness of using recycled water.

Edmonton noted that at the present time there was sufficient water in the river; however, it cited a recent study commissioned by the North Saskatchewan Watershed Alliance that indicated that future water demand from the North Saskatchewan River was expected to increase over the next 20 years. Edmonton stated that the assimilative capacity of the North Saskatchewan River was required to assist in the breakdown of the waste streams that currently exited from the Gold Bar and the Capital Region wastewater treatment plants. Edmonton argued that the collective demand from North West and other upgraders planned for the region and future developments within Edmonton, as well as in downstream communities, raised the risk of reducing the assimilative capacity of the river and restricting future growth.

Edmonton believed that use of wastewater from the wastewater treatment plants represented a tremendous opportunity to address a growing problem. Edmonton noted, however, that success required cooperation from all of the industries, Edmonton, and the Capital Region Wastewater Treatment Plant. Edmonton did not believe that the *Water Act* application process was the appropriate forum to encourage such cooperation.

Edmonton acknowledged that the infrastructure to enable the use of treated effluent did not exist at the present time. Edmonton also acknowledged that it was not a participant in the existing industry groups that were examining options for the use of recycled water.

12.1.4 Views of the Board

The Board acknowledges the efforts of North West to decrease its proposed water withdrawal from the North Saskatchewan River and reduce water discharge and disposal volumes. The Board further acknowledges North West's commitment to consider the various alternatives being

developed within the region as a means for further managing regional water resources, including the use of grey water effluent from Edmonton. As noted in Section 6.2, the Board believes the region would benefit from a regional management plan and that having the necessary infrastructure in place to accommodate growth will minimize the impacts on the region. In the Board's view, the use of effluent wastewater from Edmonton's wastewater treatment plants is a regional issue that could be managed through a regional planning initiative.

The Board notes that the North West upgrader requires a fixed amount of water to operate, and whether it gets this water from the North Saskatchewan River (downstream of the wastewater plant) or from the wastewater plant prior to release into the river will not impact the overall volume of water in the river. Use of grey water effluent in the upgrader could improve river water quality, as the effluent would not be returned to the river. The possible improvement in water quality has not been quantified.

The Board notes that under the *Water Act*, AENV is the responsible authority for managing the water resources of the North Saskatchewan River. The Board is confident that as part of AENV's approval process, it will ensure that the water resources in the North Saskatchewan River are managed effectively and that it will not allow overallocation of the resource.

The Board notes that while Dr. Nkemdirim stated that his calculations showed that the North Saskatchewan river was overallocated, the Board does not accept Dr. Nkemdirim's methodology as credible. With respect to Dr. Nkemdirim's remaining testimony, the Board did not find it material and has given it little weight.

The Board understands that North West is presently evaluating options for deep well disposal and that this will be the subject of an EUB application.

12.2 Surface Water Drainage

12.2.1 Views of North West

North West stated that its surface drainage management plan was twofold: first, controlling surface drainage within its project footprint and, second, controlling surface drainage from adjacent lands.

North West stated that the project site would be graded and ditched and containment structures would be built to ensure that precipitation and surface drainage were managed appropriately. Process-affected water would be routed to storage ponds on site, and non-process-affected water would be routed to separate storage facilities on site. In both cases the water would be used within the project, thereby reducing water withdrawal from the North Saskatchewan River.

North West stated that to control surface drainage from adjacent lands it would install diversion ditches around its site to ensure that this water was redirected around the site and allowed to resume its natural course. North West stated that its diversion system would be designed to maintain the natural drainage of adjacent lands such that there would be no risk or at least no increased risk of flooding or backup onto adjacent properties. North West stated that detailed engineering was scheduled to commence in a few months and that the final design would incorporate the above objectives for both on-site and off-site drainage.

North West committed to consult with Mr. Smulski as part of its detailed engineering design phase for its surface water diversion plans. North West further committed to abide by any setback provisions of Sturgeon County for the placement of drainage ditches and roads.

12.2.2 Views of Mr. Smulski

Mr. Smulski presented recent aerial photos of his property, North West's proposed project site, and the surrounding lands to illustrate surface drainage in the region. During the presentation and discussion of the photos, Mr. Smulski expressed concern about the lack of information in North West's application concerning the flow of surface water and how North West's proposed development would impact adjacent lands. Mr. Smulski argued that the surrounding landowners should not be expected to bear the liability of a disruption in the natural surface drainage patterns because North West had not, to date, undertaken the appropriate studies to determine the surface flow and to mitigate the impacts of its project.

12.2.3 Views of the Board

The aerial photos provided by Mr. Smulski illustrated the need to properly design surface drainage around North West's site. The Board understands that North West is presently designing its diversion system. The Board does not believe the design of a diversion system to meet North West's objectives will be a significant technical challenge. The Board expects North West will meet its commitment and involve Mr. Smulski in the design of its surface water diversion plans.

The Board notes that AENV is the responsible authority for surface drainage issues raised during the proceedings.

12.3 Groundwater

12.3.1 Views of North West

North West stated that it intended to locate groundwater monitoring wells within its plant footprint at locations it determined to be "high risk." These were areas where there was a potential risk of future groundwater contamination in the event of a spill or areas where there was a potential for spill containment measures to fail to catch all spills. North West would also be installing groundwater monitoring wells around the perimeter of its facility. North West argued that its groundwater monitoring and mitigation plan minimized the risk of its operations contaminating groundwater and would protect the groundwater of domestic users.

North West stated that the final location and number of groundwater monitoring wells, the frequency of monitoring, and the components to be monitored would be subject to further discussions with AENV.

Based on the data collected from its site, North West stated that groundwater flow was south and southeast towards the North Saskatchewan River. Groundwater flow in the area had a vertically downward component between the till and the bedrock and eventually to the North Saskatchewan River.

North West argued that elevated levels of calcium sulphate and uranium and the wide variance in total dissolved solids in the groundwater were natural occurrences.

12.3.2 Views of Mr. Smulski

Mr. Smulski stated that there were extensive piezometer installations on his lands and that he had been actively monitoring groundwater flow since 1992. Mr. Smulski argued that based on his monitoring and the work of his consultants, there was significant “mounding” occurring and there was also upgradient travel of contaminants into the aquifers. Mr. Smulski specifically noted that in various aquifers adjacent to Agrium’s gypsum pond, the contamination had migrated upgradient by as much as half a mile.

Mr. Smulski argued that without proper mitigation measures, it was foreseeable that mounding would occur in Section 19, next to North West’s site. While Mr. Smulski acknowledged that contaminant release from North West might not travel upgradient into Section 19, he argued that the cumulative effect of North West and Agrium’s phosphogypsum stockpile would be mounding and a redirection of groundwater flow. Mr. Smulski did not accept North West’s argument that existing consolidation due to glacial action would mitigate further consolidation due the construction of the North West upgrader.

Mr. Smulski suggested that because of the potential impact on groundwater flow from the construction of the upgrader, North West should undertake a more comprehensive testing and monitoring program to identify problems and implement mitigation strategies should they be needed.

12.3.3 Views of the Board

The Board understands that North West will be installing groundwater monitoring wells on its plant site and around the perimeter of the facility. The Board notes that the final location and number of wells will be the decision of AENV, which is the responsible authority for groundwater issues.

The Board notes that Mr. Smulski did not provide any evidence to support his position that the North West upgrader would impact groundwater flow and quality.

The Board expects North West to meet its commitment to consult with Mr. Smulski when developing its groundwater monitoring program.

13 TECHNOLOGY

13.1 Sulphur Recovery

13.1.1 Views of North West

In its application, North West stated that it would utilize SuperclausTM as its sulphur recovery technology, that it would achieve a minimum sulphur recovery for the first phase of its proposed project starting at 98.8 per cent, and that it would increase recovery to 99.1 per cent over three

years. The remaining two phases of its proposed project would operate at 99.1 per cent at the outset.

At the hearing, North West stated that upon further review, and in consideration of stakeholders' concerns, it had elected to use a EuroclausTM catalyst in its sulphur recovery process and that it now committed to achieve a 99.2 per cent sulphur recovery under the same conditions as above. North West confirmed that its sulphur recovery would not be impacted in the event its gasifier was not in operation.

North West noted that its proposed level of sulphur recovery exceeded EUB *Interim Directive (ID) 2001-03: Sulphur Recovery Guidelines for the Province of Alberta* requirements. North West stated that under *ID 2001-03* it would only be required to achieve a sulphur recovery of 98.8 per cent based on a sulphur inlet rate of approximately 1100 tonnes per day.

North West stated that it had selected its sulphur recovery technology having regard for process safety, process reliability, capital and operating costs, and EUB and AENV regulatory requirements. North West argued that its sulphur recovery technology was the BATEA for its project and that it represented a significant step up from the minimum requirements for a facility of its size.

North West submitted that increasing sulphur recovery beyond what it had proposed would require the use of a different technology. North West stated that, based on published data, adding tail gas cleanup to its sulphur recovery plant could increase the capital cost of sulphur recovery by a factor of two. North West also stated that there would be additional operating and maintenance costs, as well as the impacts of a technology change on the rest of the project. North West argued that, based on its air modelling of emissions, increasing its sulphur recovery to 99.8 per cent would not materially change the quality of the airshed in the region. If it were required to achieve a higher level of sulphur recovery, North West stated that the project would have to be redesigned and the ripple effect of that requirement with respect to economic impacts on the project would be a consideration for the company.

North West requested approval to ramp up its sulphur recovery for the first phase of its project over a three-year period to accommodate changes in feedstocks, performance deficiencies, and unexpected process upsets. North West stated, however, that it would nonetheless operate its sulphur recovery plant at whatever performance level it was capable of.

13.1.2 Views of NESCIL/CFRD

NESCIL/CFRD noted that in a recent decision the Board stated that it was “encouraged by the benchmark of environmental performance that Shell has established with respect to sulphur recovery for its Scotford upgrader, particularly in light of the current and projected level of industrial development in Strathcona County and in the Alberta Industrial Heartland.”

NESCIL/CFRD argued that the North West upgrader should not be approved unless it was designed to achieve this benchmark set by Shell of a sulphur recovery of at least 99.8 per cent.

NESCIL/CFRD did not accept North West's argument that its contribution to the airshed was minimal and that further reductions in SO₂ emissions would not be beneficial to the airshed.

13.1.3 Views of the Smiths

The Smiths supported NESICL/CFRD statements and further noted that under Section 49 of the *Oil Sands Conservation Regulations*, “an operator shall carry out operations in a manner that, under normal operating conditions, will... (e) maximize the gathering of gaseous mixtures containing hydrogen sulphide for deliver to the sulphur recovery plant....” The Smiths argued that since these were the regulations under which the application was being made, the Board must apply them to the proposed project.

13.1.4 Views of Mr. Smulski

Mr. Smulski submitted that there were various technologies that could improve upon the level of sulphur recovery that North West was proposing.

13.1.5 Views of Shell

In closing argument, Shell acknowledged that there was no evidence to indicate there would be unacceptable effects associated with the proposed project, but it argued that industry and the regulators had a responsibility to ensure that the capacity of the AIH airshed could accommodate future development. Shell stated that one way to achieve this objective was for the Board to require that BATEA be implemented for all new facilities and for all expansions at existing facilities. Shell stated that in its opinion, applying BATEA for sulphur recovery would limit emissions to 0.2 per cent of inlet sulphur rates, or an equivalent sulphur recovery of 99.8 per cent.

13.1.6 Views of the Board

The Board notes that during the hearing North West volunteered to increase its sulphur recovery to 99.2 per cent from 99.1 per cent with the addition of the Euroclaus™ catalyst. North West made this commitment even though it claimed that for a facility of the size it is proposing the guidelines only require a minimum 98.8 per cent sulphur recovery, and air modelling at this level does not show a material effect on air quality in the region. The Board also notes that North West made this commitment, in part, to address the concerns of interveners. The Board notes that none of the interveners provided specific evidence to support their contention that North West should be required to increase its sulphur recovery.

In determining the appropriate level of sulphur recovery for North West’s project, the Board believes that it must consider the circumstances anticipated in the AIH region. *ID 2001-03* provides discretion in setting sulphur recovery requirements where unique circumstances exist. The Board believes that the existing concentration of industrial facilities and the planned or proposed future industrial development for this region represent unique circumstances not fully contemplated in the guidelines.

The Board notes that *ID 2001-03* is not intended to achieve specific air quality objectives but rather to establish minimum performance levels for the recovery of sulphur and for the reduction of SO₂ emissions. The Board also notes that the cumulative acid gas processing capacity in the region exceeds 2000 tonnes per day. Under *ID 2001-03*, a 2000-tonne-per-day sour gas plant would be expected to use a design sulphur recovery criteria of 99.8 per cent and would be required to achieve a minimum calendar quarter-year sulphur recovery of 99.5 per cent.

The Board acknowledges that under *ID 2001-03*, North West would only be required to achieve a minimum calendar quarter-year sulphur recovery of 98.4 per cent as a standalone facility. However, the Board does not believe that regional circumstances warrant such a narrow interpretation of *ID 2001-03*, and the Board believes that sulphur recovery within the AIH area should be regulated on a regional basis.

While the Board understands the technical, cost, and operational impacts of requiring North West to move to a higher sulphur recovery, the Board believes it is in the broad public interest to preserve airshed capacity in the region, and it will condition North West's approval to use a design sulphur recovery criteria of 99.8 per cent and to achieve a minimum calendar quarter-year sulphur recovery of 99.5 per cent.

While the Board accepts that upgraders are complex facilities to start up, it does not believe that a three-year ramp-up of sulphur recovery is necessary or appropriate. For phase one of the project, the Board will condition North West's approval to require it to achieve its approved sulphur recovery six months after start-up.

13.2 Sulphur Blocking

13.2.1 Views of North West

North West stated that blocking sulphur on site was not part of its current application, nor was it North West's intention to do so in the future. However, North West acknowledged that if it did intend to block sulphur on site, it would be the subject of a separate application.

13.2.2 Views of Mr. Smulski

On behalf of Mr. Smulski, the Friends of Lamont County (FOLC) presented an overview of the global sulphur market and argued that the projected increase in hydrocarbon development and the resulting increase in sulphur production would lead to a glut of sulphur in the market. It argued that the increase of sulphur production in the absence of markets would result in sulphur blocking in the province and in particular in the AIH.

FOLC cited a sulphur block proposed to be located between the towns of Bruderheim and Lamont. FOLC argued that the location of sulphur blocks should be under the jurisdiction of the EUB and that an EIA should be required. FOLC noted, however, that the proposed sulphur block was under the jurisdiction of the Natural Resources Conservation Board (NRCB), which had eventually required an EIA due to pressure from the community.

13.2.3 Views of the Board

The Board notes that North West has not included sulphur blocking as part of its application. Therefore, any plans to block sulphur at this site would be subject to an application and subsequent review at that time.

The Board acknowledges that the projected level of sulphur production in the province may lead to future issues of storage subject to the availability of markets. The Board believes that this is a matter that the Government of Alberta needs to be cognizant of in order to ensure that an

appropriate policy is in place. The Board notes that FOLC has already raised its issues with the Oil Sands Ministerial Strategy Committee of the Alberta Government.

The Board takes no position with respect to the sulphur blocking application cited by FOLC, which is before the NRCB. The Board reviews applications for sulphur blocking when they are associated with energy facilities.

13.3 Gasification

13.3.1 Views of North West

North West stated that it intended to use gasification technology to produce hydrogen for its project. The gasifier would convert vacuum resid into hydrogen and a dry, pure carbon dioxide (CO₂) stream, which would be ideally suited for commercial use, enhanced oil recovery, and other forms of carbon capture and storage. North West stated that through the use of gasification technology it would be able to capture up to 70 per cent of its total CO₂ emissions. It indicated that it was investigating options to capture and use the CO₂ stream.

North West submitted that gasification was a more effective way to produce hydrogen than conventional steam methane reforming. North West noted that it would have to consume an additional 120 million standard cubic feet per day of natural gas to produce the same amount of hydrogen through steam methane reforming. North West argued that while gasification had a higher greenhouse gas intensity, overall both approaches produced similar amounts of CO₂ when the life cycle of all products and by-products was taken into consideration.

North West noted that soot from the gasifier would be trucked to a metals recovery facility or an appropriate landfill subject to its specific characteristics. North West stated that it had not conducted a fugitive emissions assessment, as the soot was to be transported as a wet filter cake inside a container. North West understood that the landfill at Riley had sufficient capacity to handle the volume of soot if it were classified as a hazardous waste.

13.3.2 Views of NESICL/CFRD

NESICL/CFRD noted that the North West project would result in a significant amount of greenhouse gases and had a very high emissions intensity. They believed it was not in the public interest to approval a project with this level of greenhouse gas emissions.

NESICL/CFRD consultant Ms. Goodwin stated that she expected emissions of ammonia, hydrogen cyanide, mercury, metal carbonyls, toluene, phenols, cresols, polycyclic aromatic hydrocarbons, phenolic esters, and methanol from the gasifier. Ms. Goodwin noted that North West had not assessed these compounds.

Ms. Goodwin also noted that the hazards associated with the ultrafine waste soot had not been assessed and noted that the soot was expected to contain heavy metals. Ms. Goodwin had concerns respecting the number of trucks required to transport the soot, fugitive emissions during transport, and the ultimate disposition of the soot.

13.3.3 Views of the Board

The Board accepts that gasification is an appropriate technology for the production of hydrogen for North West's proposed upgrader. The Board recognizes that a significant benefit of the gasifier is that it will produce a pure CO₂ stream, which allows for easy capture and use of CO₂ in the future. The Board notes North West's commitment to continue to investigate options to use this CO₂.

The Board notes that Ms. Goodwin did not provide any evidence to support her position with respect to gasifier emissions. The Board understands the gasifier to be a closed system, with no emission points other than the venting of CO₂ and the potential for fugitive emissions. The Board is satisfied that an appropriate LDAR program will properly manage fugitive emissions from the gasifier.

The Board notes that North West has committed to transport the gasifier soot in closed containers, thereby minimizing emissions during transport. The Board understands that North West is considering opportunities to recover the heavy metals from the soot; otherwise it will be disposed of in an appropriately licensed landfill. As a result, the Board is satisfied that the production, handling, and transportation of the soot will be handled in a satisfactory manner.

The Board notes that AENV is the responsible regulatory authority for greenhouse gas emissions management through the *Climate Change and Emissions Management Act*.

14 NOISE

14.1 Views of North West

North West committed to meet the EUB's noise requirements in *Directive 038: Noise Control*. North West stated that it would use augered, cast-in-place piles in preference to driven piles, where practical, to reduce construction noise. It also committed to restrict hours of operation for higher noise level construction activities and to use noise mitigation technology on the construction equipment. North West stated that it would not deliberately schedule noisy activities for the evening hours, but if unavoidable, it would inform local residents in advance. North West stated that the operating facility would include low-decibel equipment designed to mitigate day-to-day operational noise, as well as other noise controls for major sources at the upgrader.

North West explained that it conducted a background noise level survey at three locations in the vicinity of its proposed site. It noted that the noise monitoring was done in accordance with *Directive 038*. Furthermore, North West noted that the EUB had conducted noise monitoring in the AIH in 2002, 2003, and 2004. Although not at the same locations as North West, North West's and the EUB's measurements were consistent. North West concluded that its noise impact assessment (NIA) was based on adequate information.

North West noted that an expert retained on behalf NESCIL/CFRD had reviewed the NIA and had raised no material concerns.

North West stated that it had attempted to conduct a noise survey at Mr. Smulski's mobile home, about 200 m north of the proposed project, but was unable to obtain permission to enter his land prior to completion of the noise survey.

North West determined that Mr. Smulski's mobile home was a non-residential site based on a number of factors. North West noted that the Sturgeon County resident location map did not include Mr. Smulski's site. In discussion with Mr. Smulski and his neighbours, it was never referred to as a residential site. North West also noted that during its time in the area it had never seen any signs that the building was occupied. As a result, North West did not identify Mr. Smulski's mobile home as a residence and it was not recognized as an impacted residence in the NIA.

14.2 Views of NESICL/CFRD

NESICL/CFRD was concerned about noise from the facility and impacts on lifestyle and animals. Mr. Meijer, a member of NESICL/CFRD, was specifically concerned about the health of his poultry because they were susceptible to changes in noise and light levels. Loud or sudden noise, such as truck air brakes or during construction of the facility, could frighten poultry. Mr. Meijer stated that a noise assessment was not conducted on his property. He believed that a noise monitor should be installed on his property to establish the baseline noise levels and record changes to noise levels.

14.3 Views of Mr. Smulski

Mr. Smulski stated that there was an agricultural dwelling or mobile home on his land next to North West's proposed project. The mobile home had water, power, heat, and three bedrooms to accommodate himself and his employees during farming operations. Mr. Smulski noted that the tires on the mobile home had been removed and it was suspended on blocks. He admitted that time spent in the mobile home could vary. He said that he had spent a couple weeks in the mobile home over the last year but in previous years his employee had spent almost half a year in the mobile home.

Mr. Smulski was concerned that a noise survey was not conducted at his site despite being the closest affected residence to the proposed project. Mr. Smulski indicated that he was prepared to allow North West access to his lands to conduct a noise survey but expected a nominal fee to cover the cost of one of his employees being present during the survey.

14.4 Views of the Board

The Board expects that North West will keep its commitments to mitigate noise during the construction and operation of its facility.

The Board finds that Mr. Smulski's mobile home on the southwest quarter of Section 19, Township 56, Range 21, West of the 4th Meridian, is a seasonally occupied dwelling under *Directive 038*. As a result, the Board will condition North West's approval to require North West to submit a revised NIA to the EUB for review and approval by March 3, 2008.

Dated in Calgary, Alberta, on August 7, 2007.

ALBERTA ENERGY AND UTILITIES BOARD

<Original signed by>

J. D. Dilay, P.Eng.
Presiding Member

<Original signed by>

W. A. Warren, P.Eng.
Acting Board Member

<Original signed by>

D. K. Boyler, P.Eng.
Acting Board Member

APPENDIX 1 HEARING PARTICIPANTS

Principals and Representatives (Abbreviations used in report)

Witnesses

North West Upgrading Inc. (North West)

B. S. Gilmour
S. M. Munro
D. A. Sheehan

T. Bachynski
D. Bertsch
B. Koppe, P.Biol.
J. Kupper, P.Eng.
T. MacDougall
N. Maybee
R. Pearce
J. Perrone, P.Eng.
J. Quinn, P.Eng.
R. Rudolph
B. Shelast, P. Biol.
R. Thomas, P.Eng.
A. Watson, P.Eng.
D. Wong, P.Eng.

Northeast Sturgeon County Industrial Landowners (NESCIL)¹

Citizens For Responsible Development (CFRD)²

R. C. Secord
K. Buss

D. Blake, Ph.D.
A. Brown
D. Chichak
M. Chichak
S. Cholewa
T. Cholewa
V. Goodwin
W. Groot
R. Kiriak
L. Martin
R. Meijer
L. Nkendirim, Ph.D.
K. Shaw

City of Edmonton (Edmonton)

M. Young

M. Brostrom
J. Riopel
P. Tsounis
D. Vanderwel, P.Eng.

Environment Canada (EC)

M. Vincent
L. Dunham

D. Fox
F. Letchford
R. Mintz
M. Norton
C. Watt

 Principals and Representatives
 (Abbreviations used in report)

Witnesses

 Lyn Smith and Rhonda Smith (Smith)
 D. Bishop
L. Smith
R. SmithSV Half Diamond Ranch, SV Farms Ltd., Ken
Smulski (Smulski)

K. Smulski

Friends of Lamont County (FOLC)

D. Maschmeyer
W. SchneiderAlexander First Nation (AFN)
C. O'DriscollJ. Arcand
A. Paul

Council of Canadians (COC)

L. Gorman

Onoway River Valley Conservation
Association (ORVCA)M. Northcott
I. SkinnerSaddle Lake Cree Nation (SLCN)
C. D. McCoy

D. Bretton

Government of Alberta (Alberta)
T. G. RothwellShell Canada Ltd. (Shell)
S. Denstedt
 Alberta Energy and Utilities Board staff
 T. Bews, Board Counsel
 M. Fierro
 R. Germain, P.Eng.
 K. A. Siriunas, P.Eng.
 D. R. Williams, P.Eng., Ph.D.

¹ Northeast Sturgeon County Industrial Landowners (NESCIL)

 Robert Swiderski and Sophie Swiderski
 Tim Cholewa and Sherril Cholewa
 Stuart Shaw and Karen Shaw
 Joan Sudayko and Mike Sudayko
 Doug Reed and Mary-Ann Reed
 Russ Kiriak
 Roelof Meijer
 Carey Reeves
 Ron Heuser and Anupma Heuser
 Florence Drabble and Rex Drabble

² Citizens for Responsible Development (CFRD)

Stuart Shaw and Karen Shaw

Wayne Groot and Luzmaria Groot

Axel Dzurny

Dennis Chichak and Maureen Chichak

Mike Brown and Anne Brown

Barb Collier

Toula Prins and Reg Prins

Patricia Callaghan

Tia Bartlett

Karen Berg

Charles D'Aoust and Sharon D'Aoust

APPENDIX 2 SUMMARY OF COMMITMENTS

The Board notes that North West has committed to conduct certain activities in connection with its operations that are not strictly required by EUB regulations or guidelines. It is the Board's view that when a company makes commitments of this nature, it has satisfied itself that these activities will benefit both the project and the public, and the Board takes these commitments into account when arriving at its decision.

The Board expects North West to carry out the commitments or to advise the Board if, for whatever reasons, it cannot fulfill a commitment. The Board would then assess whether the circumstances regarding the failed commitment warrant a review of the original approval. The Board notes that the affected parties also have the right to request a review of the original approval if commitments made by North West remain unfulfilled.

The Board expects that North West will document its progress on its commitments and that North West will file this information with the Board on request.

COMMITMENTS BY NORTH WEST UPGRADING INC.

The following commitments are taken from Exhibit 31, filed by North West during the course of the hearing.

Water

- North West will run a peripheral ditch on the north boundary of its property. Within the property limits, North West plans to conduct a site grading such that all of the water is contained within its property.
- North West has designed surface water diversion and protection measures to maintain control of surface water to accommodate the 1-in-100-year flood events. North West will also ensure that any surface water on its site is captured and used in its process to minimize reliance on river water and prevent release of such captured water to the natural environment.
- North West commits to consult with Mr. Smulski on the design of mitigation measures to control surface water diversion around the project area.
- North West commits to reduce its water withdrawal from the North Saskatchewan River, its discharge of treated water effluent to the North Saskatchewan River, and its deep well disposal water volumes by 25 per cent, 86 per cent, and 65 per cent respectively, relative to its original application.
- North West commits to reduce the project's effluent flow to about 78 m³/hour.
- North West will provide financial support and contribution of data to regional groundwater initiatives conducted by NCIA. North West will contribute all data it has gathered to the regional initiative.
- North West commits to install an impervious compacted clay liner over its secondary containment area, which includes product storage tanks, wastewater tanks, and sumps.

- North West commits to install a leak detection and collection system under each storage tank and diked area.
- North West commits to monthly inspections of its liners and to construct all process units on concrete pads.
- North West commits to install monitoring wells immediately downgradient of the process facilities.
- North West has placed a representative on the North Saskatchewan Watershed Alliance and will participate in a Regional Advisory Committee for the integrated water management plan.
- North West commits to continuing to work with Ducks Unlimited to develop a compensation mitigation plan to compensate for direct effects to isolated wetlands and will provide AENV with details of that compensation plan when it is finalized.
- North West commits to continue to evaluate its process and operating practices to determine if opportunities for reducing water use and maximizing water recycle are available.
- If it is determined that the water wells are affected by localized dewatering, North West will provide potable water to the affected party(s).

Air

- North West commits to no off-lease odours under normal operating conditions.
- North West commits to work within the rules and regulations of any air quality management plan developed in accordance with the CASA PM/O₃ Management Framework.
- North West agrees to fund the purchase of a continuous ozone monitor for FAP.
- Should NCIA, FAP, or another (possibly new) regional monitoring group establish a program for acid deposition terrestrial-effects monitoring in the region, North West would be willing to participate with both personnel and funding support.
- North West will participate in regional monitoring programs. North West will develop an emissions management strategy which incorporates the findings of these programs in order to minimize project impacts.
- North West will contribute personnel time to directional meetings, as well as data and modelling results, as considered beneficial to FAP initiatives. North West also has a membership role on an air quality subcommittee within NCIA currently reviewing air quality initiatives.
- North West is committed to implement the most stringent LDAR program elements from either the CCME or CAPP protocol for the management of fugitive emissions.
- North West will monitor wind speed and direction at the plant site and will provide the data to FAP to incorporate into the FAP air monitoring network.

- North West commits to bringing the concerns of the local area residents to FAP.
- North West commits to participating in the management of the regional airshed as a member of NCIA and FAP and will work with these associations, as well as with other regional group initiatives and neighbouring operators.
- North West commits to ensuring that the design and construction of all equipment are done to minimize the potential for leaks and fugitive emissions and ensuring that there is no continuous flaring except for pilot and purge gas.
- Tanks storing VOCs will be equipped with vapour recovery systems to minimize emissions from tanks.
- North West commits to an immediate on-site review if an odour complaint is received. North West would follow up with the party making the complaint to ensure closure.
- North West commits to file an air quality assessment of nonroutine flaring events and a flare management plan with the EUB and AENV six months prior to plant start-up to maintain SO₂ concentrations within AAAQO.
- North West will implement a monitoring program to assess air quality in the vicinity of the project and to assess the effectiveness of mitigation during the project development and operation. The monitoring program will involve source monitoring and ambient monitoring.
- North West will meet the CCME National Emission Guideline for Commercial/Industrial Boilers and Heaters.
- North West will consider NO_x emissions as a criterion in future facility upgrades.
- North West will implement a greenhouse gas monitoring and reporting program to measure greenhouse gas emissions and identify greenhouse gas reduction opportunities.

ERP

- North West will develop a detailed site-specific ERP in cooperation with Sturgeon County, NRCAER, neighbouring industries, and residents.
- North West's detailed site-specific ERP will include potential incidents and responses, such as involving rail, adjacent industry, road, third-party pipeline, security, and spills.
- Railroad and truck incidents will be included in the detailed hazard assessments as the project develops, and specific response plans will be included in the detailed site-specific ERP.
- A full mock emergency exercise will be conducted before commissioning and start-up and will include Sturgeon County and NRCAER.
- North West will work directly with landowners/residents, industry, and industry organizations in the development of the site-specific ERP, including risk communications.
- North West will continue to refine the ERP and EPZ.

- North West's on-site emergency response team will be trained in fire-fighting, spill control and cleanup, emergency rescue, and first aid. North West's on-site ERP facilities will include an emergency treatment centre, an emergency response vehicle, and other emergency response equipment.
- North West will participate in coordinated emergency response services coordinated through NRCAER and agreements in place in Sturgeon County and the AIH.
- North West and its contractors will have an established ERP during construction, maintenance, and operations that will be vetted with local emergency service providers, including local medical service providers.

Noise

- North West will drill and pour a large portion of its piles.
- North West will use natural barriers wherever practicable for noise mitigation.
- North West will bring equipment on site fitted with mufflers that are appropriate for the equipment being used.
- North West will reduce noise during planned events, such as start-up and shutdown, by use of silencers on steam venting systems and attempt to schedule noise events during daylight.
- North West's commissioning and start-up plans will be tailored to the sensitivity of the residents.
- North West will retain an industrial noise control expert on the project during the detailed engineering phase to provide ongoing noise model development and updating, assessment and mitigation recommendations for significant facility noise sources, and acoustical specifications and bid evaluation assistance.
- North West will actively participate in the NCIA Regional Noise Management Plan. As a participant, it will conduct ongoing assessments of its noise mitigation program and maintain best practices and continuous improvement programs in facility noise control.
- Vent source identification, evaluation, and mitigation will form part of the ongoing noise model development and updating process. Acoustical specifications issued for vent silencers will include performance testing to ensure that mitigation requirements are met.
- North West will endeavour to restrict construction activity to daytime shifts. If circumstances arise requiring night shifts, North West will endeavour to minimize such circumstances and in any event comply with *Directive 038*.

Sulphur

- Liquid sulphur will be temporarily stored on site in separate storage tanks provided with filters or vents prior to loading and trucking off site. Liquid sulphur loading facilities will include paved surfaces to facilitate cleanup and appropriate dust control measures.

Traffic

- North West will be responsible for the redesign of Highway 643 required at gate entry points to accommodate safe movement of traffic.
- North West will validate plans with Sturgeon County and Alberta Transportation and Infrastructure following a more detailed design of the two intersections with Highway 643.
- North West will stagger shift changes for its construction and operating labour forces.
- North West will schedule oversized loads around school bus schedules on local roads.
- North West commits to planning deliveries of material for off-peak hours and operating a bus service for construction workers to reduce construction traffic.

Liability

- North West commits to have general liability and environmental liability insurance in place during construction and subsequent operations periods.
- North West will provide a third-party analysis of the soot filter cake to potential waste receivers to ensure that it meets acceptable limits for landfill disposal.

Socioeconomic

- North West will continue to participate in and provide financial support to the success of the AIHA-led initiative regarding the VPPP.
- North West will continue to engage nearby residents in the consultative process through participation in the AIHA initiative “Industrial Heartland Collaboration to Address Resident Issue,” as well as through continued participation in Sturgeon County ad hoc groups for planning of land-use, quality-of-life, transportation, air quality, and water quality issues. North West will continue to participate in AIHA, FAP, NCIA, Sturgeon County Economic Development Committee, and North Saskatchewan Watershed Alliance. North West will continue with one-on-one meetings, project update newsletters, and Web site updates.

Light

- North West commits to install lighting instruments that reduce light trespass and glare, reducing floodlight angles as low as practical.
- North West will install shielded luminaries that reduce stray light emission.
- North West will identify areas where light levels could be reduced when not in use.
- North West will construct visual barriers, such as berms or vegetation, to reduce visual impact.

APPENDIX 3 APPROVAL CONDITIONS

This section is provided for the convenience of readers. In the event of any difference between the conditions in this section and those in the main body of the decision, the wording in the main body of the decision shall prevail.

CONDITIONS

- North West must use a design sulphur recovery criteria of 99.8 per cent and achieve a minimum calendar quarter-year sulphur recovery of 99.5 per cent.
- For the first phase of its project, North West must achieve its approved sulphur recovery beginning 6 months after start-up.
- North West must submit a revised NIA for review and approval by March 3, 2008.