

MCFN Technical Review – Air Follow-up Meeting

June 18th, 2010

1:00 pm to 3:00 pm

Golder Associates Calgary Office

Attendees:

Bill Kovach, Shell

Brian Zelt (on behalf of MCFN)

Candace Bell, Golder Associates

Greg Unrau, Golder Associates

Kris Siriunas (on behalf of MCFN)

Michelle Barrett, Golder Associates

Wayne Speller, Golder Associates

Agenda:

1. Flaring Discussion

Question: How will flaring be minimized?

2. Odours Discussion

Question: How will Shell minimize the potential for off-lease odours?

Question: How can First Nations report an odour?

3. Developed Areas in Modelling Discussion

- The removal of receptors from the analysis of modelling results must consider the accessibility of the area to First Nations members.

4. Continuous improvement Discussion

- Shell should endeavor for increased energy efficiency and reduced emissions on an annual basis. Discuss what Shell is doing to achieve that.

5. Using Asphaltene as fuel Discussion

- Stack testing should be done for a full suite of pollutants including VOCs, PAHS, and metals.

Question: How will Shell ensure that Asphaltenes will not be used as fuel for longer than 15 minutes when any pollution control equipment fails?

1. DISCUSSION SUMMARY

The objective of this follow-up meeting was to allow MCFN an opportunity to raise any air issues and/or concerns that were not discussed at the MCFN Technical Review meeting, due to the absence of MCFN's Air technical lead. Brian Zelt and Kris Siriunas provided Shell with a set of questions to guide the discussion. The meeting commenced with Brian Zelt acknowledging that he is currently working on another Shell (Carmon Creek) project. It is understood that MCFN is aware of this work and has no issues with Brian meeting with Golder/Shell to discuss MCFN Air Issues on the Jackpine Mine Expansion and Pierre River Mine project.

Shell made no commitments at the meeting and acknowledged that talks about commitments specific to the JME will happen at a later date. However, Shell did state the one commitment they have made to the MCFN was to consult with them when designing any monitoring programs.

Flaring Discussion:

Shell explained that flaring will be limited to upset and emergency conditions, start-up and commissioning and that Shell will minimize flaring through preventive and regular plant maintenance. Shell suggested this complies with the initiative detailed in Directive 060, which includes requirements

for improved flare efficiencies, evaluation of alternatives to routine flaring and tighter reporting requirements.

MCFN asked if Shell's procedures would align with CAPP's "Best management practice for facility flaring" guide, noting that this guide provides operators a more stringent and direct management tool to eliminate and /or reduce routine and non-routine flare volumes and frequency. MCFN suggested it would like more transparent communication and proof of the activities Shell is doing. This would give MCFN more comfort that Shell is continually improving and meeting/exceeding industry standards.

ACTION: Shell to determine if CAPP's "Best Management Practices for Facility Flare Reduction" is being incorporated into its operations and inform MCFN of findings.

Shell has incorporated CAPP's "Best Management Practices for Facility Flare Reduction" into its' MRM operations. To reduce facility flaring, solvent vapour is collected from the process through vapour recovery unit (VRU). Rather than sending the solvent vapour to flare, the condensed liquid solvent is sent back to process and the vapour solvent is sent to Cogeneration area as fuel gas. We have procedures in place to maintain an efficient VRU system so that we can recycle as much liquid solvent we can and send as much solvent as possible to Generation boiler fuel.

In situations where the design capacity of the system is exceeded, such as during some upset conditions and maintenance shut downs, a relief system will collect the solvent vapours and direct them to flare.

Follow-up Discussion on August 4th, 2010:

ACTION: Shell to provide formal clarification that the Jackpine Mine Expansion will also incorporate CAPP's "Best Management Practices for Facility Flare Reduction".

The Jackpine Mine Expansion will also incorporate CAPP's "Best Management Practices for Facility Flare Reduction".

Odour Discussion:

Odour was noted as a major concern for MCFN (i.e. related to health and quality of life) and, although MCFN recognizes that odours are difficult to assess, suggested that industry should treat odour concerns with the same diligence and rigour they would other health concerns. MCFN requested Shell demonstrate that there is a process in place for minimizing odour generation. In general, MCFN felt Shell needs to be looking for "unknown" odour issues actively and with transparency to give MCFN comfort. MCFN also noted its concern with management of odour complaints (i.e. the process and timing), asserting that there is a loss of confidence if there is not proper and timely feedback after an odour complaint is issued.

Shell acknowledged the concerns and explained that its sources of odour would be the mine face, tailing pond, mine fleet and plant site. Shell explained that management systems such as the Leak Detection and Repair (LDAR) program are being used to minimize the potential for off-lease odours from the plant site. Shell also explained that it is working to minimize its paraffinic solvent losses to the tailing ponds. At a higher level, Shell conveyed that it is also utilizing the plant-wide fugitive emissions identification and control management system set out in CAPP guidelines and the ISO 14001 certified HSE and Environmental Management System for continuous improvement in environmental performance.

With respect to odour complaints, Shell advised that it has an Odour Complaint Response plan in place for external odour complaints. Shell noted that thus far it has not been the source of any external odour complaints advising that monitoring stations are in the place to measure VOC emissions at specific time intervals.

Shell's highlighted the aspects of its odour complaint response plan indicating they included:

- Complaints received by Security dispatcher
- Manager or Team Leader investigates complaint, takes appropriate action to correct situation and develops response.
- If designated to do so by Manager External Affairs, the person who made the complaint will be contacted with response.
- Manager External Affairs maintain records and provides summaries of complaints, action items and outstanding issues to senior management.

ACTION: Shell to provide additional information on odour complaint response to support highlights provided in meeting – SIR response was suggested as appropriate level of information.

Section 14.1

HEALTH

PIERRE RIVER MINE
SUPPLEMENTAL INFORMATION
PART 3: AENV SIRS – ROUND 2

AENV SIRS 79 – 89

Question No. 79

Request

Volume 2, SIR 57a, Page 18-5.

Shell was asked to discuss the response/mitigation plan for odour complaints. Shell states The existing Muskeg River Mine HSE management system will serve as the basis for health, safety and the environment (HSE) management system at the Pierre River Mine.

79a

Provide a copy of the HSE management system to help clarify the odor response/mitigation actions that take place in the event of a complaint.

Response

79a

The following provides excerpts from Shell's health, safety and the environment (HSE) work practice manual, which is used at the Muskeg River Mine to respond to public or stakeholder complaints, including complaints about odours.

The following outlines the process for handling public and stakeholder complaints:

- the Security Dispatcher working 24/7 will be the focal point for receiving, recording, and forwarding complaints from stakeholders

- only certain personnel, or their designates, are authorized to provide responses to complaints from the public and stakeholders
- individuals will respond to stakeholder complaints only after they have been designated and briefed by the manager responsible
- if a team member receives a complaint via phone or e-mail on Albian site, he or she will forward the phone call to Security, and e-mail it to the senior security specialist. If a verbal complaint is received off site, the team member will advise the individual to call Albian Security.

The security dispatcher will carry out the following:

- record all complaints from the public, outside sources, or regulatory authorities on the *Public/Stakeholder Complaint* form. Obtain as much information as possible from the caller, including a name and phone number where he or she could be contacted with a response to the complaint.
- notify the appropriate team of the complaint, such as Environment, External Affairs, Health, Safety & Emergency Response, Human Resources and Mining. If no team is known, direct the complaint to the security shift team leader or the on-call manager.
- forward the completed *Public/Stakeholder Complaint* form to the appropriate team for action, with a copy to the Manager, External Affairs.
- If the complaint is related to a major spill, release, or traffic disruption, which could endanger lives or property, immediately notify the Emergency Response Team (ERT). The ERT will address the situation according to established protocols.

The responsible manager or team leader will carry out the following:

- upon receiving a call from Security about a complaint, obtain all the relevant information and a copy of the *Public/Stakeholder Complaint* form
- initiate a report based on the available information
- conduct an investigation of the complaint, take appropriate action to correct the situation, and develop a response
- review the response with the manager responsible for external affairs
- if designated to do so, contact the person who had complained and provide a response on Albian's behalf
- complete the *Public/Stakeholder Complaint* form, brief the manager of external affairs, and provide a copy of the completed form
- complete the SIRS report and communicate the findings to affected parties

- forward a copy of the report to the consultation database

Follow-up Discussion on August 4th, 2010:

ACTION: Shell to provide additional information on the duration of response and reporting mechanisms related to odour complaints.

Once an external odour complaint has been reported, the responsible manager or team leader will notify the public/stakeholder within 3 business days to acknowledge receipt of the concern. The responsible manager or team leader will conduct an investigation of the complaint, take the appropriate action to correct the situation and develop a response. Within 10 business days, or earlier, a Shell Resolution Leader will follow-up with the public/stakeholder individual who reported the concern and provide a response on Shell's behalf.

Developed Areas in Modelling Discussion

MCFN expressed its concern with how Shell excludes impact predictions for areas classified as 'disturbed'. MCFN explained that Shell's treatment of disturbed areas in its air quality assessment assumes that the whole of the project footprint is fully disturbed whereas, in reality, most years the project footprint is only partially developed (i.e. part of the footprint is still natural and undisturbed).

MCFN asserted that these natural areas within these 'disturbed' footprints, if no restrictions are in place, can be occupied by MCFN given their treaty rights. They expressed concern that a community member using these natural areas might be exposed to ambient air quality which is poorer than that assessed (whether Shell's disturbed area or disturbed areas of other operators). MCFN requested Shell provide more transparency on air quality impacts within these disturbed areas.

Shell responded explaining that the fenceline is defined by the mine footprint. Receptors are located every 10 m along the fenceline and maximum predicted concentrations associated with JPME and PRM occur along the fenceline. For compounds emitted from project point sources, the maximum predicted concentrations will likely be outside the local study area since there are heavier emitting sources elsewhere in the region. Due to the large size of the mine area, the proximity of the edge of the mine to the fenceline during each operating year will not change substantially. Therefore the predicted concentrations and deposition rates at the fenceline are expected to be the same, or higher than, concentrations within the soon-to-be developed areas in the disturbance footprint. Moreover, given that the highest fuel usage year was selected for modelling, the total vehicle fleet emissions will be smaller in all other operating years.

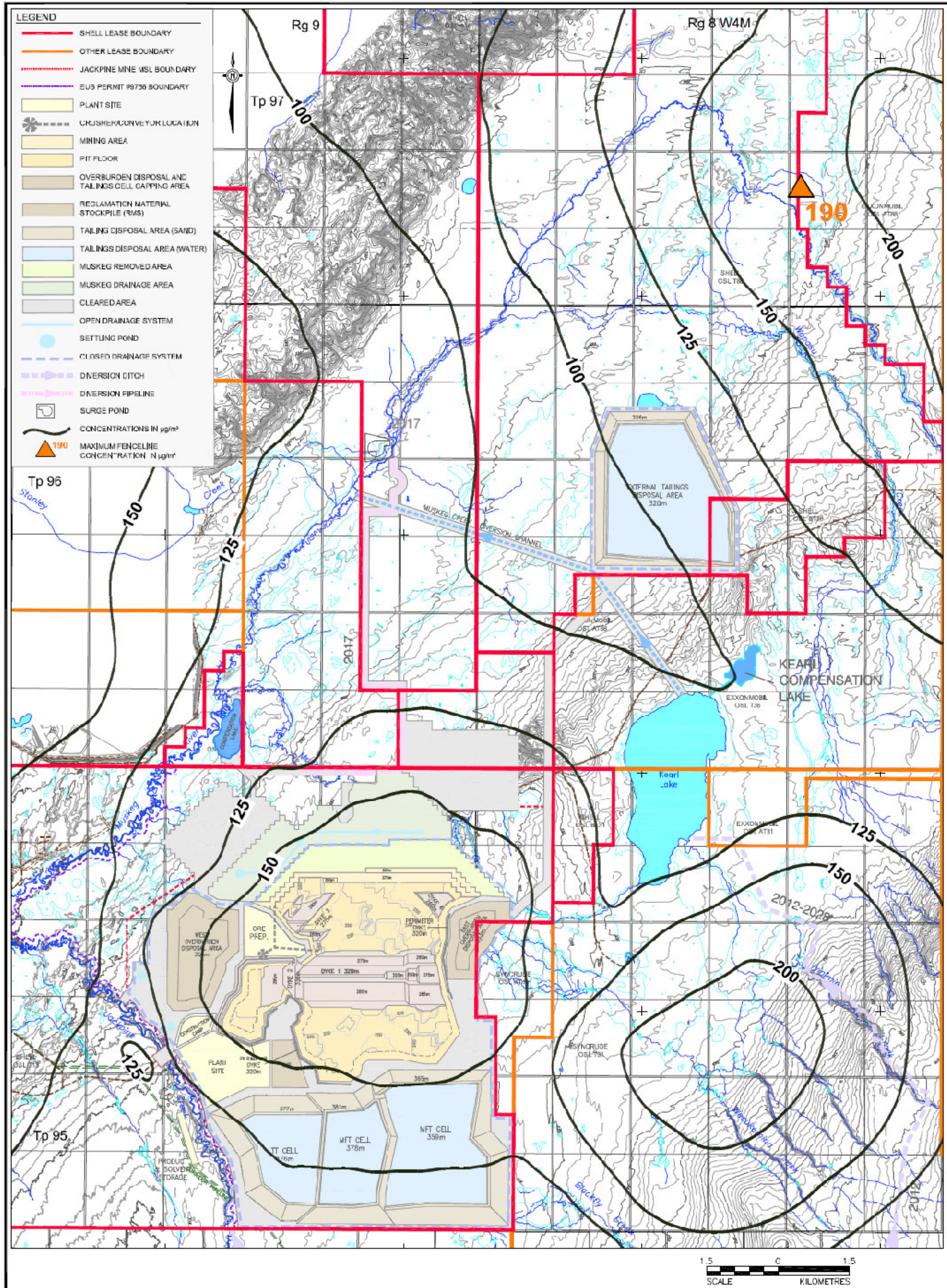
Follow-up Discussion on August 4th, 2010:

The MCFN representatives suggested they were looking for supporting figures clearly delineating where MCFN will be accessing the land during the JME project expansion and advancement to help clarify the predicted concentrations on the land and the locations where MCFN has access in the area. It was acknowledged that additional modelling is not being suggested to inform this request. Agreement was reached to take this suggestion away to see if Figures can be produced to satisfy MCFN's inquiry.

ACTION: Shell to provide requested figures, if feasible.


Figures 1, 2 and 3 (see below) present the Application Case maximum 1-hour, 24-hour and annual NO₂ concentrations within the Shell lease boundary. The Application Case in the EIA and EIA Update was assessed based on a scenario similar to the Project's mining/reclamation progression in 2019. The areas that are inaccessible due to project development in 2019 are shown in the figures. The figures show that the predicted NO₂ concentrations within the portion of the Shell lease potentially accessible are lower than the maximum fence-line concentrations used to assess human health risk in the EIA.

L:\2010\1346\10-1346-0801\5500\55'B\Report A\Fig 1 APC-Maximum 1-Hour NO₂ CONCENTRATIONS-JEMA.dwg Aug 11, 2010 - 10:52am

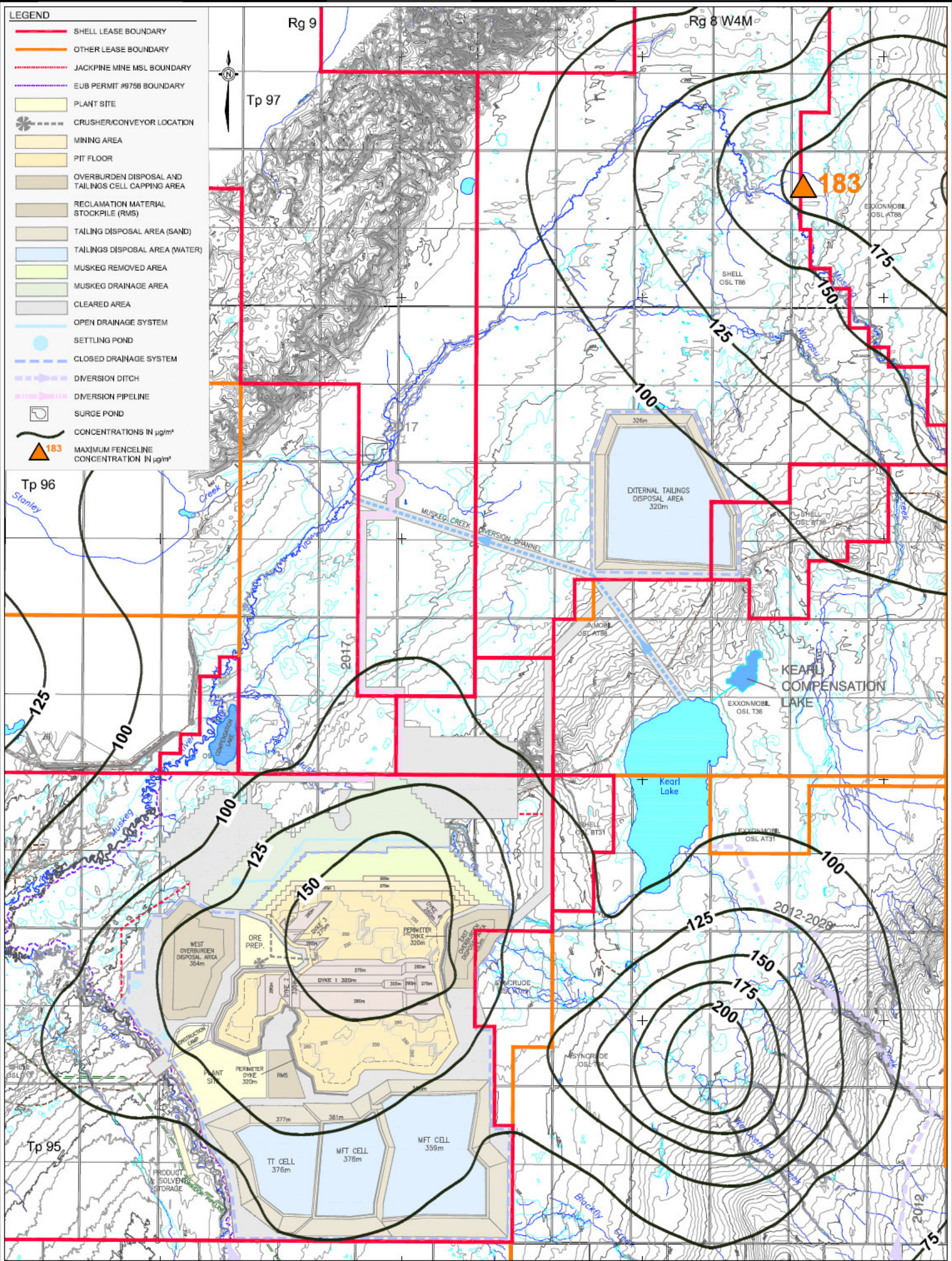


REFERENCE


Alberta Digital Data Obtained from Alberta LID, (September 2004.) Used Under License, Projection: Transverse Mercator
 Datum: NAD 83 Coordinate System: UTM Zone 12.
 The base map is taken from the Shell EIA Update, Appendix II, Figure 26 (Shell 2008). It represents the mining/reclamation progression for the expanded Jackpine Mine development area in 2019.
 The NO₂ concentration contour lines are taken from Shell E.A., Volume 3, Appendix 3-9, Figure 13 (Shell 2007) with additional contour intervals shown in the figure.

PROJECT	JACKPINE MINE EXPANSION & PIERRE RIVER MINE PROJECT		
TITLE	APPLICATION CASE MAXIMUM 1-HOUR NO ₂ CONCENTRATIONS		
 Shell Canada Limited	PROJECT	10-1346-0001-5500	FILE No. 1013460015518A001
	DESIGN	CB	06/08/10
	CADD	PSR	10/08/10
	CHECK	DC	10/08/10
REVIEW	WES	11/08/10	SCALE AS SHOWN REV. 0
			FIGURE: 1

L:\2010\1346\10-1346-0001\5500\5518\Report A\Fig 2 APC-Peak 24-Hour NO₂ CONCENTRATIONS-JEMA.dwg Aug 11, 2010 - 10:54am



REFERENCE
 Alberta Digital Data Obtained from Atfalls LTD, (September 2004.) Used Under License, Projection: Transverse Mercator
 Datum: NAD 83 Coordinate System; UTM Zone 12.
 The base map is taken from the Shell EIA Update, Appendix II, Figure 26 (Shell 2008). It represents the mining / reclamation
 progression for the expanded Jackpine Mine development area in 2019.
 The NO₂ concentration contour lines are taken from Shell EIA, Volume 3, Appendix 3-9, Figure 14 (Shell 2007)
 with additional contour intervals shown in the figure.

PROJECT	JACKPINE MINE EXPANSION & PIERRE RIVER MINE PROJECT		
TITLE	APPLICATION CASE PEAK 24-HOUR NO ₂ CONCENTRATIONS		
 Shell Canada Limited	PROJECT	10.1346.0001.5500	FILE No. 10134600015518A002
	DESIGN	CB	06/08/10
	CADD	PSR	10/08/10
	CHECK	DC	10/08/10
REVIEW	WES	11/08/10	SCALE AS SHOWN REV. 0
			FIGURE: 2

Continuous Improvement

MCFN requested that Shell make a commitment for continuous improvement and provide MCFN information demonstrating its continuous improvement efforts and their associated performance results. MCFN suggested that emission reporting should indicate what emissions values are today, what changes have been seen and what Shell is doing to further decrease the emissions.

Shell acknowledged MCFN's concern and noted that Shell is continually looking at ways to increase energy efficiency. Shell suggested efforts including Shell's QUEST (carbon sequestration) project, Shell's move to high temperature froth treatment (i.e. more energy efficient), Shell's commitment to shift to US EPA Tier 4 compliant engines when available, and Shell's selection of pollution control equipment for the proposed asphaltene-fired cogeneration units all demonstrate Shell's dedication to continuous improvement in reducing air emissions.

Both parties agreed that emission reporting is already being done, but MCFN reiterated that more transparency is needed to give them comfort that a complete set of results were being shown and one could easily see what Shell has done in the past, what they are doing currently, and what Shell is doing in the future.

Shell acknowledged the importance of transparency and suggested that efforts for better transparency are underway (citing the Muskeg River Mine environmental report meeting held earlier in the year with MCFN and other key stakeholders).

Using Asphaltene as fuel Discussion

MCFN provided its view that natural gas is thought to be the best energy source for minimizing environmental impacts and that Shell's proposed asphaltene-fired units should be as "clean" as natural gas. MCFN requested Shell demonstrate that there will be no unforeseen impacts if the pollution control technology fails to adequately manage asphaltene-fired emissions. MCFN also suggested that Shell provide additional details (to those in the EIA) to clarify its commitment for minimizing impacts related to combustion of this new fuel source (e.g. PAHs, metals, VOCs). MCFN lastly asked if Shell's asphaltene-fired emissions would comply (and meet targets set out in) Alberta Environment's Policy 1A.

Shell advised that it had addressed a number of these concerns in response to provincial Supplemental Information Requests (SIR), listing the SIR responses for MCFN. These responses were related to EIA Volume 3 Section 3.1.5.2, PRM SIR 230c and PRM SIR Round 2 ERCB 43a.

Shell explained that it has proposed natural gas as an alternative to asphaltene-fired cogeneration and that dual boiler and burner design is proposed to allow for switching to natural gas in case of upsets. Shell advised that it assessed process upsets. One of these upset scenarios is related to failure of SO₂ pollution control equipment. In this situation of pollution control equipment failure, asphaltenes will not be used as fuel for longer than 15 minutes. The probability of this upset event occurring is low because Shell has committed to redundant SO₂ pollution control equipment. In addition, if the FGD system fails the dual boiler and burner design allows for short notice switching to natural gas.

In regard to uncertainties in emissions due to asphaltene characteristics, Shell advised that once the pollution control equipment is selected and the regulatory requirements known, the stack monitoring program will be finalized. Shell conveyed that it has performed modelling on PAHs and metals to see what they would look like, but has not made any monitoring commitments. Shell confirmed it will complete stack surveys and sampling on new boilers and heaters in a similar fashion detailed in Shell's existing AENV EPEA approval conditions, on a suite of pollutants.

ACTION: Shell will provide MCFN with a table which compares Shell's predictions to the emissions limits/targets detailed in Policy 1B.

Table 1 provides a comparison of the asphaltene cogeneration unit emissions with AENV Policy 1B.

Table 1 Comparison of Shell JME and PRM Asphaltene Cogeneration Unit Emissions to AENV Policy 1B Emission Standards

Parameter	Compliance Standard [g/GJ _{input}]	Performance Target [g/GJ _{input}]	JME/PRM Asphaltene Cogen Emissions [g/GJ _{input}]
SO ₂	116	70	55
NO _x	50	40	39
PM	11	9	2

Follow-up Discussion on August 4th, 2010:

ACTION: Shell will provide MCFN with additional table comparing emissions of similarly sized asphaltene-fired versus natural gas-fired cogeneration units, in units of tonnes per day.

Table 2 provides the SO₂, NO_x and PM_{2.5} emission rates for the asphaltene cogeneration unit when burning asphaltenes and natural gas. It is important to note that when the asphaltene cogeneration unit is burning asphaltenes, the unit would fall under Policy 1B which applies to the use of non-gaseous fossil fuels for steam generation in in-situ bitumen or heavy oil recovery projects. Since this unit is not a conventional cogeneration unit (i.e., does not have a HRSG), Policy 2 emission standards for boilers greater than 10.5 GJ/hr would apply when the unit is burning natural gas. Table 3 provides a comparison of the AENV Policy 1B and Policy 2 emission standards.

Table 2 Comparison of Asphaltene Cogeneration Unit Emission Rates

Parameter	Asphaltene Cogen Burning Asphaltenes	Asphaltene Cogen Burning Natural Gas using Policy 2 Compliance Limit
SO ₂ [t/d]	4.07	0.02
NO _x [t/d]	2.89	1.94
PM _{2.5} [t/d]	0.18	0.24

Table 3 Comparison of Policy 1B and Policy 2 Emission Standards

Parameter	Policy 1B		Policy 2	
	Compliance Standard [g/GJ _{input}]	Performance Target [g/GJ _{input}]	Compliance Standard [g/GJ _{input}]	Performance Target [g/GJ _{input}]
SO ₂	116	70	—	—
NO _x	50	40	26	7.9
PM	11	9	—	—

Follow-up Discussion on August 4th, 2010:

The MCFN representative asked for details on how Shell would monitor to know when the air pollution control is down. Shell reiterated that the details of this system will be established during detailed design and, as discussed in the original meeting, that Shell has already formally noted that asphaltene will not be used as fuel for longer than 15 minutes should pollution control equipment fail. The MCFN representative recognized that a complete answer at this time may be premature.

2. SUMMARY OF FOLLOW-UP ACTION ITEMS

1. Shell to determine if CAPP's "Best Management Practices for Facility Flare Reduction" is being incorporated into its operations and inform MCFN of findings. – **Completed: See above for response.**
2. Shell to provide additional information on odour complaint response to support highlights provided in meeting – SIR response was suggested as appropriate level of information. – **Completed: See above for response.**
3. Shell will provide MCFN with a table which compares Shell's predictions to the emissions limits/targets detailed in Policy 1B. – **Completed: See above for response.**