March 27, 2013

Ms. Susan Tiege
Section Leader
Alberta / Northwest Territories Region
Canadian Environmental Assessment Agency
CDI Building 425, 10115 – 100A Street
Edmonton, Alberta, T5J 2W2

Dear Ms. Tiege:

RE: Application under the *Canadian Environmental Assessment Act* ("CEAA") for the Coal Valley Resources Inc. Robb Trend Project – Supplemental Information Request Responses - 2nd Round

An Environmental Impact Assessment (EIA) and Mine Permit Application was submitted on April 11, 2012 which addressed the environmental aspects of the proposed Coal Valley Resources Inc.'s (CVRI) Robb Trend Project (the Project) at the Coal Valley Mine (CVM).

In December 2012, CVRI submitted responses to the first round of SIRs. In February 2013, CEAA completed their review and centred on these responses, CEAA has formulated a second round of SIRs.

Based on previous discussions with CEAA, CVRI has completed responses to these latest SIRs in order to continue the review of the application. The complete set of SIR responses including questions from both AESRD and the ERCB is still in progress and will be submitted in the near future.

All communications in respect to the application should be directed to:

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Yours truly,

COAL VALLEY RESOURCES INC.

<original signed by>

Les, LaFleur
Project Manager
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Kevin Peters, Millennium EMS Solutions Ltd.

Coal Valley Resources Inc. - Coal Valley Mine

Robb Trend Project
Environmental Impact Assessment and Mine Permit Application
EPEA - 028-00011066; ERCB - 1725257

Supplemental Information Request Responses
Round 2

Submitted to
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March 2013

Coal Valley Resources Inc. Robb Trend Project

Supplemental Information Request – Round 2
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4. FEDERAL

The responses to questions in this Approvals section will not be considered as part of the EIA completeness decision made by Alberta Environment.

4.1 Environment Canada

37. Supplemental Information Request Responses, Response 189, Page 340.

In response to SIR # 189, CVRI stated that *[t]he current ESRD approval for the operation of the CVM specifies that surface water bodies will be monitored by grab sample once per year for "inorganic parameters" listed in "Canadian Water Quality Guidelines for the Protection of Aquatic Life 1999 (as amended). These parameters are listed in CR #3 Tables 3.4-2 and 3.4-3. This would therefore be the "acceptable quality (level)".* However, not all of the inorganic parameters listed in CR #3 Tables 3.4-2 and 3.4-3 have levels listed in the *Canadian Water Quality Guidelines for the Protection of Aquatic Life 1999.*

a. For those inorganic parameters listed in CR #3 Tables 3.4-2 and 3.4-3 which do not have acceptable levels as defined in the *Canadian Water Quality Guidelines for the Protection of Aquatic Life 1999*, indicate how "acceptable quality" will be defined.

Response:

Inorganic parameters listed in CR #3 Tables 3.4-2 and 3.4-3 which do not have acceptable levels as defined in the *Canadian Water Quality Guidelines for the Protection of Aquatic Life 1999*, have no regulatory definition of "acceptable quality" and are therefore taken by CVRI (and regulators) to not require assessment. However, CVRI, if required, will work with AESRD to define acceptable quality for those inorganic parameters for which no acceptable levels are defined in the *Canadian Water Quality Guidelines for the Protection of Aquatic Life 1999* on the basis of:

1. Guidelines and standards for those parameters that may exist in other jurisdictions (*e.g.*, British Columbia, US Environmental Protection Agency); or
2. Comparison of measured values against ranges of regional reference values for those parameters.

CVRI expects any decision on specific monitoring and assessment approaches for these inorganic parameters will be determined by AESRD as part of approval requirements for the Project.

38. Supplemental Information Request Responses, Response 191, PAGE 341.

In response to SIR # 191, CVRI stated that *[t]he 'competent rock' will be taken from the proposed mine pits and hauled to provide 'common fill' for the haul road construction. Solid, unweathered rock is preferred for construction. Therefore, it is the same 'overburden rock' that has been tested for the mine. Overburden characteristics have been described in CR#10, Section 4.0.*

While the reference section does state that *A total of 128 overburden samples (mostly bedrock) from fourteen test holes (Figure 8) were collected by CVM and analysed for texture, carbonate content, detailed salinity and metals*, it does not include any information on testing for the potential for acid generation.

a) Clarify how the testing discussed in CR#10 will determine the suitability of overburden for the construction of haul roads, with respect to the potential for acid generation and metal leaching.

Response:

CVRI requires durable run-of-mine rock for both road base construction and surfacing. A thick blocky sandstone sequence is located above the Val d'Or Seam and will be mined throughout the length of the Project in massive quantities. The zone is often + 60 m thick forming the major overburden above the seam. The material is blasted and loaded/hauled with mine equipment. This material will be used for roads as is the current routine practice at the CVM.

Past Experience/Data

Acid rock drainage in the Coal Valley area has been investigated in the past and found not to be of a significant issue.

The most recent data available for the CVM area was reported within a 1999 EPEA application related to a previous mining extension at CVM. This report stated "acid rock drainage potential was assessed using the modified acid-base accounting technique and paste pH was assessed for all samples. All evidence indicates that acid mine drainage will not be a factor in the CVM materials (Table H-16)." The referenced table is provided for review as Table 38-1. The three samples included in this tabulation are all representative of overburden above the Val d'Or Seam. The deepest materials would be equivalent to the massive, blocky 'sandstone' forecast for road construction utilization at the Project.

Table 38-1 Acid-Base Accounting Results (1)

Sample ID	Sample Depth	AGP	ANP	Net NP	ANP:AGP
97-50 (West Ext. #1)	0-6 m	0.6	122	121	203
	12-18 m	4	20	16	5
	24-31 m	6	14	8	2
	37-43 m	10	20	10	2
	49-55 m	2	49	47	25
	55-61 m	1	49	48	49
97-91 (West Ext. #2)	0-6 m	0.6	46	45	66
	12-18 m	0.7	46	45	66
	24-31 m	11	47	36	4
	37-43 m	7	48	40	7
	49-55 m	4	47	43	12
	49-55 m	0.8	46	45	58
98-124 (South Block)	6-12 m	0.4	46	46	115
	18-24 m	0.9	52	51	58
	31-37 m	0.8	46	45	58
	49-55 m	0.8	46	45	58
	67-73 m	0.8	46	45	58
	79-85 m	3	143	140	48

ANP = Acid Neutralizing Potential (in tonnes of $CaCO^3$ per 1000 tonnes of rock)
AGP = Acid Generating Potential (same units as ANP)
Net NP = ANP – AGP.
Net NP greater than 0 is considered non-acid producing.
ANP:AGP greater than 3 (conservative) is considered non-acid producing.
Method Reference: Modified Acid Base Accounting in CANMET/MEND report "Acid Rock Drainage Prediction Manual".
[1]Source: Coal Valley Mine Extension Project. Part H, Table H-16. Luscar Ltd. April 15, 1999. Page H-43

Data for Nearby Project

A proposed coal mine operation is located near the Project and is also currently in government review. While this project is located a significant distance to the north the geologic conditions and formations are equivalent to those found at Robb Trend. This project will also recover the same coal seams as those found at Robb Trend. In the 2012 Coalspur Mines Ltd. – Vista Project EIA, (Coalspur, 2012) *Baseline Soil and Terrain Survey and Effects Assessment Report*, Section 5.1.4 explains how acid potential can be determined and how overburden areas of concern will, over time see a decrease in pH due to exposure to environmental elements (precipitation, oxygen, natural weathering).

Coalspur 2012 refers to the Mine Environment Neutral Drainage (MEND) which uses acid-base accounting in order to formulate the potential of acid rock drainage (Tremblay and Hogan, 2000). The net potential for acid generation is determined by the Acid Potential (AP) and Neutralizing Potential (NP) of overburden material. Based off of these two calculations one can derive the Net Neutralizing Potential (NNP) or Neutralizing Potential Ratio (NPR) which is expressed as:

- NNP = NO-AP; and
- NPR = NP/AP.

If the NNP calculation is negative, the overburden material is rated as a potential source of acid drainage. Non-acid producing overburden is considered when the NNP is a positive number. The overburden samples taken from the Coalspur Vista Project were analyzed for the acid potential and all samples had a positive NNP value.

When reviewing the 2012 Coalspur report, Table 15 (Coalspur, 2012), the sandstone material found in the overburden samples all contain high NP and NNP values meaning a low potential for acid drainage. Table 15 from the Coalspur report is provided below listed as Table 38-2. The sample depth acid base accounting data related to sandstone located above the Val d'Or seam is highlighted. Please note all samples related to sandstone located above the Val d'Or seam are non-acid producing.

Table 38-2 Acid-base Accounting Results for 2010 and 2011 Overburden Samples(1)

Sample ID	Depth (m)	Neutralizing Potential (NP)	Acid Potential (AP)	Net Neutralizing Potential (NP-AP)	Neutralizing Potential Ratio (NP/AP)
GT11-01-CH	10-20	55	2	53	27.5
	20-30	63	2	61	31.5
	30-40	71	2	69	35.5
	40-50	60	2	58	30
	50-60	49	1	48	49
	70-80	36	2	34	18
	80-90	48	1	47	48
	90-100	77	2	75	38.5
	100-110	54	2	52	27
	110-120	179	1	178	89.5
	120-130	52	2	50	26
	150-160	38	7	31	5.4
	160-170	40	4	36	10
	190-200	84	2	82	42
	200-210	42	2	40	21

Table 38-2 Acid-base Accounting Results for 2010 and 2011 Overburden Samples(1)

Sample ID	Depth (m)	Neutralizing Potential (NP)	Acid Potential (AP)	Net Neutralizing Potential (NP-AP)	Neutralizing Potential Ratio (NP/AP)
	220-230	55	1	54	55
	230-240	46	2	44	23
GT11-02-CH	14-24	128	1	127	128
	44-54	55	5	50	11
	54-64	67	2	65	35.5
	84-94	69	1	68	69
	114-124	28	2	26	14
	124-134	59	1	58	59
	134-144	43	2	41	21.5
	144-154	54	1	53	54
	154-164	51	4	47	12.75
	164-174	39	5	34	7.8
	184-194	20	4	16	5
GT11-08-CH	26.82-36.82	14	2	12	7
	36.82-46.82	32	3	29	10.7
	46.82-56.82	55	1	54	55
	56.82-66.82	64	1	63	64
	66.82-76.82	76	1	75	76
	76.82-86.82	105	2	103	52.5
	106.82-116.82	47	1	46	47
	127.82-137.82	28	1	27	28
GT11-09-CH	21-31	32	2	30	16
	31-41	53	1	52	53
	41-51	46	2	44	23
	51-61	46	2	44	23
	61-71	34	7	27	4.9
GT11-12-CH	17.3-29.7	48	1	47	48
	29.7-39.7	42	3	39	14
	39.7-49.7	45	2	43	22.5
	49.7-59.7	44	1	43	44
	59.7-69.7	41	1	40	41
	81.38-89.7	59	2	57	29.5
	89.7-99.7	61	2	59	30.5
	99.7-104.26	34	1	33	34
	112.9-119.7	48	4	44	12
	119.7-129.7	39	1	38	39
	129.7-139.7	25	2	23	12.5
	139.7-149.7	20	5	15	4

Table 38-2 Acid-base Accounting Results for 2010 and 2011 Overburden Samples(1)

Sample ID	Depth (m)	Neutralizing Potential (NP)	Acid Potential (AP)	Net Neutralizing Potential (NP-AP)	Neutralizing Potential Ratio (NP/AP)
	149.7-159.7	55	3	52	18.3
	159.7-169.7	23	2	21	11.5
	169.7-175.54	41	2	39	20.5
	199.7-209.7	58	1	57	58
GT11-01-AG	2.13	132	1	131	132
GT11-12-AG	2.29	89	1	89	89
	9.91	120	2	120	60
GT11-202-TP	4.0	76	0	76	-
GT11-214-TP	4.1	91	0	91	-
GT11-216-TP	4.0	48	0	48	-
GT11-232-TP	3.0	192	0	192	-
GT11-233-TP	3.5	136	0	136	-
OB-W10-02-4	15.0-20.0	161	1	160	161
OB-E10-05-3	10.0	101	3	98	33.7

(1)Source: Coalspur Mines (Operations) Ltd. – Vista Project, April 2012. Baseline Soil and Terrain Survey and Effects Assessment. Pages 64-66.

Summary Acid Generating Material

Based on the historical evidence of over three decades of mining at the Coal Valley Mine where no acid rock drainage issues have ever occurred, previous overburden sample results that have not shown concentrations of sulfide minerals and the Coalspur 2012 EIA report that is within the same coal trend as the CVM, it is concluded that the potential for acid rock drainage is low for the Project.

Metal Leaching

Acid generation in alkaline calcareous substrates as found in the Project area is not likely. A possible mechanism could be through the absorption of metallic cations on the surfaces of soil particles, which would leave the anions, predominantly sulfates in this case, in pore solution. As a result, when the solutes are getting washed out they may be more acidic than the substrate itself. This can be expected in fine-textured mineral substrates characterized by high specific area. Fine-textured substrate itself may also become problematic from the geotechnical standpoint due to the absorption of sodium from dissolved sodium sulfate.

Both, the acid generation and increase in the substrate sodicity can be avoided simply by using only sandstone. Sodium sulfate and other salts would leach more easily from the coarse material and the potential for secondary salinization of surrounding area is to be taken into account. Luckily, the sandstone tends to contain considerably less salts than the finer textured samples according to the analyses. The content of heavy metals in the substrates is not excessively high either and therefore do not seem to pose a major problem as sandstone is the main material being used for haul road construction at the CVM.

4.2 Natural Resources Canada

39. Supplemental Information Request Responses, Response 210, Page 363.

In their response to SIR 210, CVRI states that *climate change is indifferent to ecosystem makeup* and that *the minor spatial differences between Edmonton and Edson (CVM) are insignificant to climate change over the long term.*

a) Provide a justification and rationale for the applicability of the predictions generated by using the Edmonton data (e.g. explain how model results are representative of the Edson (CVM) area when existing differences between Edmonton and Edson make Edmonton a poor surrogate for Edson). Response should reference model prediction uncertainty.

Response:

Barrow and Yu (2005) provided regional predictions for climate change in Alberta. From the many predictions available, five scenarios were selected to represent conditions which were cooler and wetter (NCARPCM A1B), cooler and drier (CGCM2 B2(3)), warmer and wetter (HadCM3 A2(a)) and warmer and drier (CCSRNIES A1FI) than median conditions (HadCM3 B2(b)). Climate change scenarios were constructed for minimum, mean and maximum temperature, precipitation, degree days > 5°C and annual moisture index.

Changes in annual mean temperature by the 2050s were predicted to be typically between 3°C and 5°C. Changes in maximum and minimum temperature are similar to those for mean temperature, although the changes in minimum temperature tend to be slightly greater than those for maximum temperature thus implying a general decrease in the diurnal temperature range. For the 2050s, changes in annual precipitation are generally within the range –10% to +15%, and any decreases in annual precipitation are generally driven by decreases in summer precipitation. By the 2080s, however, all five climate change scenarios indicate increases in annual precipitation of up to 15% in general. Degree days > 5°C and annual moisture index scenarios indicate increases of between 30-50% and 20-30% by the 2050s, respectively. The projected increases in annual moisture index are generally driven by the large increases in degree days above 5°C, rather than by decreases in precipitation.

Variability in model predictions for mean temperature are shown in Figure 39-1 over the three time ranges considered in the global circulation models, and in joint seasonal temperature and precipitation in Figure 39-2 for the time slice of the 2050s. Considering just the range in temperature in the 2050s in Figure 39-2, the range varies from about 2°C to 6°C depending on the season, much larger than the current difference in mean annual temperature between the two stations of about 0.3°C (Table 39-1 and Figure 39-3).

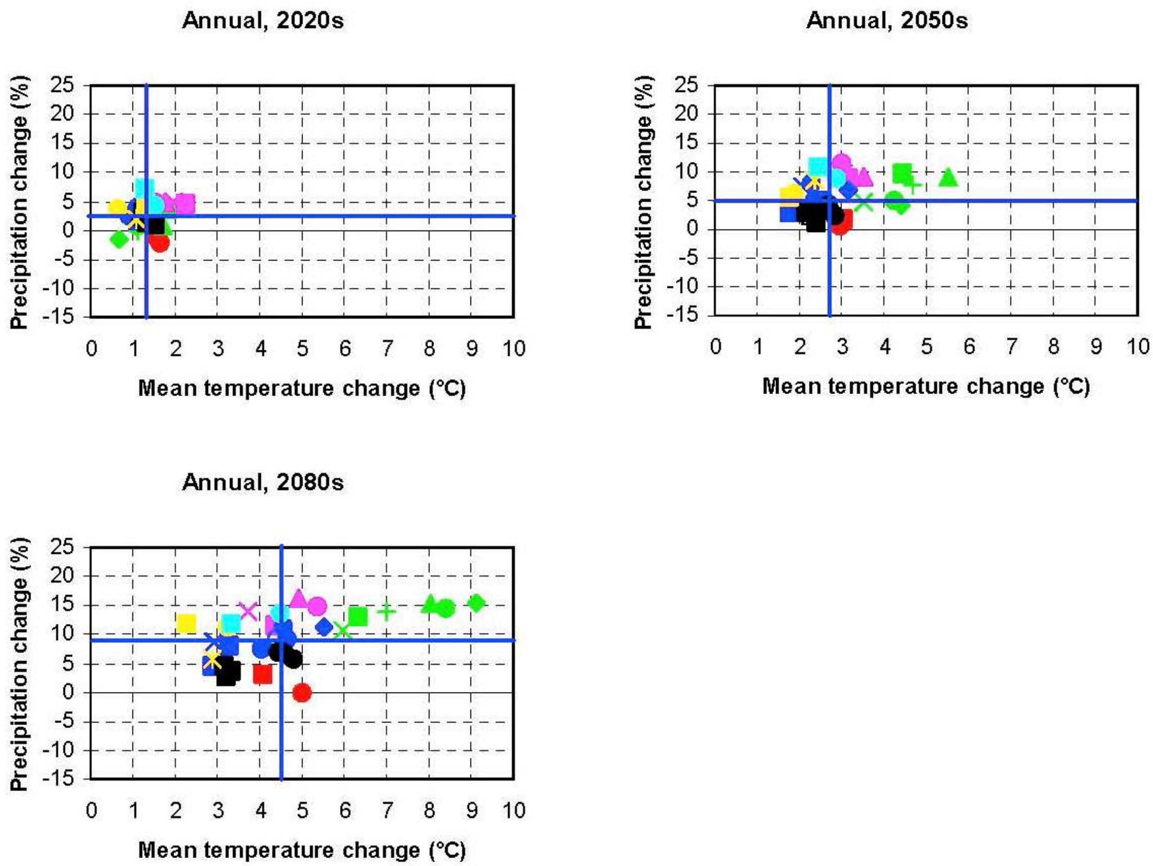

Figure 39-1 Range in projected changes in global-mean temperature (°C), in response to a number of different emissions scenarios. From Barrow and Yu (2005).

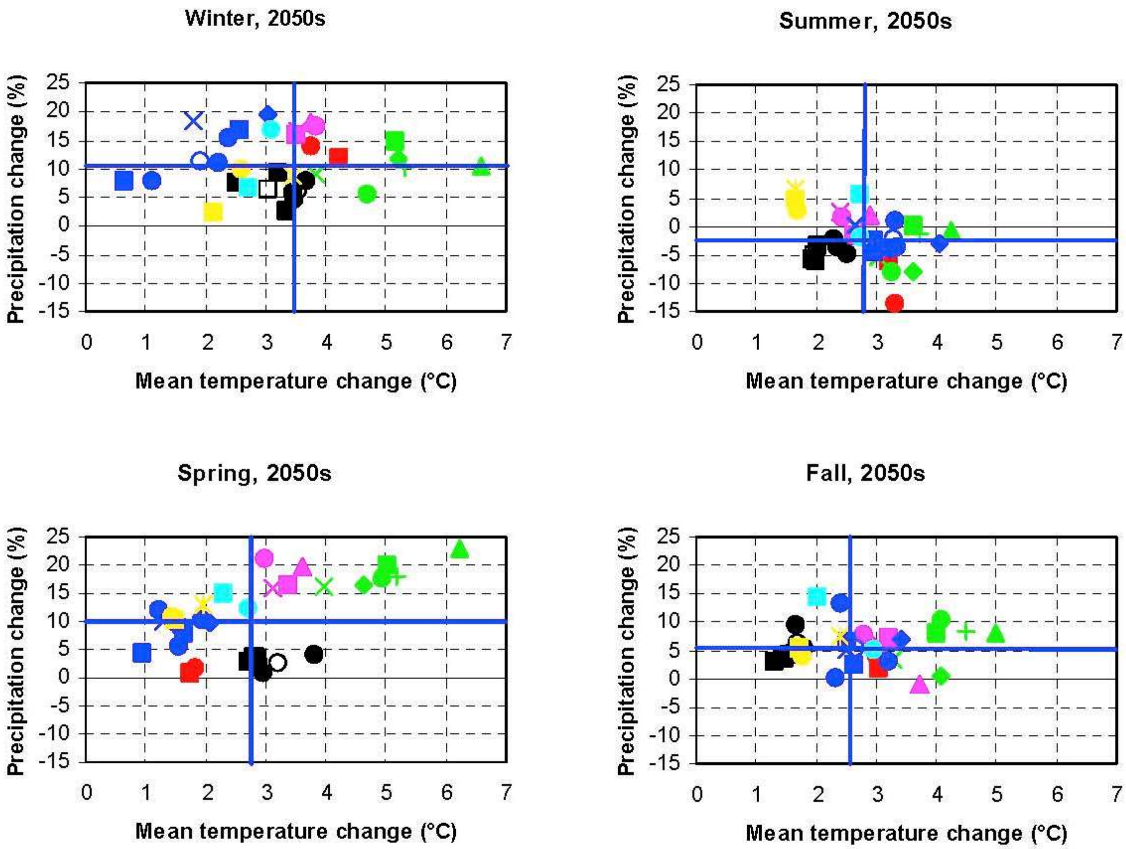

Figure 39-2 Scatter plots indicating seasonal changes in mean temperature (°C) and precipitation (%) for Alberta for the 2050s based on a number of climate models. From Barrow and Yu (2005).

Table 39-1 Monthly Mean Temperature															
Edson	**Temperature Mean Value**	C	-11.8	-9.5	-3.7	3.3	8.7	12.6	14.8	13.7	8.7	3.6	-6.3	-11.7	1.87
Edmonton	**Temperature Mean Value**	C	-14.2	-10.8	-5.4	3.7	10.3	14.2	16.0	15.0	9.9	4.6	-5.7	-12.2	2.12

Source: http://www.climate-charts.com/Locations/c/CN71123030122050.php

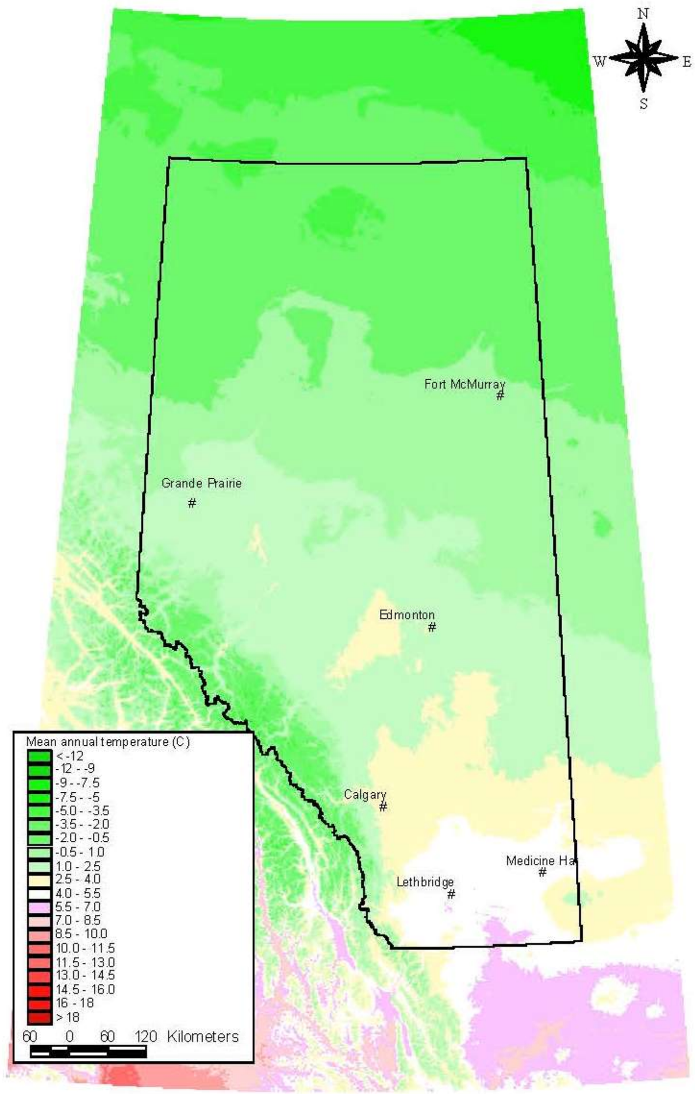

Figure 39-3 Mean annual temperature in the baseline period 1961-1990. From Barrow and Yu (2005).

Figure 39-4 shows the predicted change in climate over Alberta for the five scenarios examined. It shows that the change in climate is similar in most areas of the province for most scenarios and in particular for the median scenario used in the assessment. Changes in precipitation are more geographically variable but the change in precipitation is similar in the Edmonton and Edson areas.

Further, by considering the actual conditions in the period 1960-1990, Barrow and Yu described detailed climate scenario results for only six representative sites in Alberta – Lethbridge, Medicine Hat, Calgary, Edmonton, Grande Prairie and Fort McMurray. Edmonton is the closest of these cities to Edson and based on the discussion above, its climate change statistics were used to represent the Edson area.

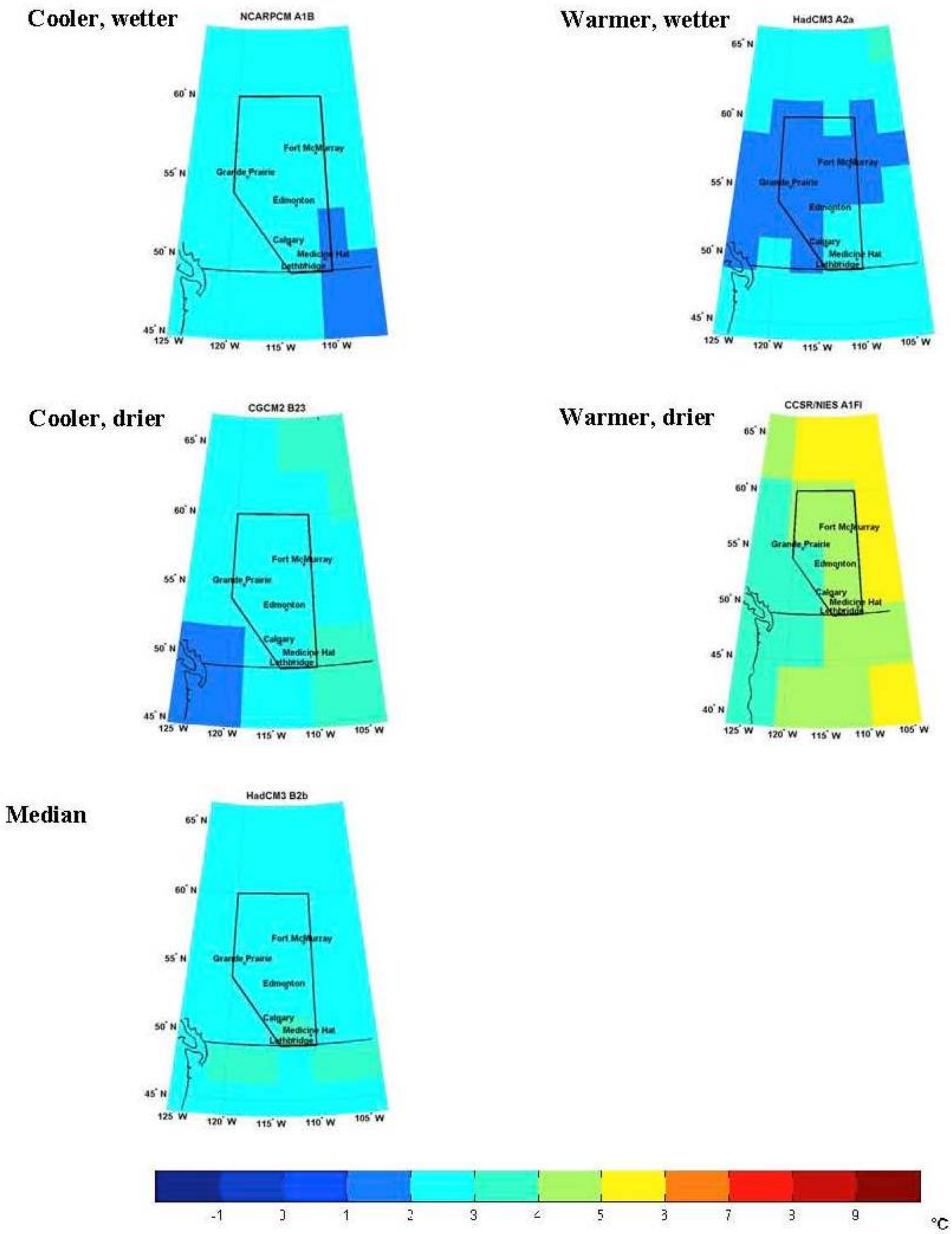

Figure 39-4 Annual mean temperature changes (°C) for the 2050s with respect to 1961-1990 at the original global climate model resolution.

Reference:

Barrow, E. and G. Yu. 2005. Climate change scenarios for Alberta. Prepared for the Prairie Adaptation Research Collaborative (PARC) in co-operation with Alberta Environment. 73 p.

40. Supplemental Information Request Responses, Response 211, Page 363.

In their response to SIR 211, CVRI states that with regards to 're-worked till', *[s]econdary deposits are those having undergone 'reworking' through actions such as fluvial transport or erosion.*

a) Explain why re-worked till is not classed as fluvial sediment.

Response:

Volume 2, Appendix 9 was provided by CVRI to give a '*summary of geological and geotechnical characteristics at the site*[1]'. This report notes that 'the surficial deposits in the proposed Project area and CVM areas is primarily a thin mantle of till with local glaciolacustrine deposits and post-glacial alluvial, colluvial, and organic deposits[2]'. The report also notes that 'other surficial deposits in the area are only minor in aerial extent and include glaciolacustrine silts and clays, colluvium material transported by gravity driven processes on hillside and valleyside areas, alluvium sands and gravels located within river and stream valleys, and organic deposits situated around wetlands[3].

Section 4.2.1 of Volume 2, Appendix 9 notes that the information presented regarding surficial soils were summarized from a large number of previous engineering reports conducted for CVM[4]. It is in this section that the term 'lacustrine/re-worked till' is mentioned, specifically in reference to 'wetland deposit'. The report appears to be dividing 'wetland deposit' into four material types: 1) peat, 2) organic silt, 3) re-worked-tills and 4) lacustrine.

b) Provide a description of the sedimentological and physical characteristics of the "reworked till" unit, and explain why it classifies as a "till", whether it is a diamicton and whether it contains erratic clasts.

Section 4.2.2, Volume 2, Appendix 9 also contains a reference to 'reworked till' and 're-worked silt till' and references Table 4.1 which is attributed to Piteau, 1982. This Piteau report is an early engineering materials investigation specific to the Project area. The relevant material from this reference is as follows:

[1] Volume 2, Appendix 9, Page 1
[2] Volume 2, Appendix 9, Page 7 & 8
[3] Volume 2, Appendix 9, Page 8
[4] Volume 2, Appendix 9, Page 34

> *5.1.2 Lacustrine Deposits and Re-worked Glacial Till*
>
> *Present beneath the peat mantle in wetland depressions are water laid soft silts and fine sands derived from parent glacial till. The units form broad, flat lying valley bases, commonly in excess of 200 m in width. Thickness of between 3.2 m and 10.5 m are encountered in Robb Block.*
>
> *These deposits are distinguishable only by gradation, with the re-worked till being slightly coarser than the lacustrine silt. Larger proportions of gravel are present within the re-worked glacial till. Coarser re-worked till was deposited under conditions of more torrid flow that those prevailing during sedimentation of silt.*
>
> *The lacustrine deposits consist of greyish green to greenish brown, soft, silty sands and sandy silts containing a trace to a little clay. Rootlets and organics are present to a maximum proportion of 30% within the deposit, the material being odorous. Liquid and plastic limits of 52% and 37%, respectively, were recorded on a sample of highly organic silt. The material is classified as being of medium plasticity.*
>
> *Where the lacustrine deposit is present, it overlies the re-worked till. The re-worked till is dark greyish green to greenish brown in colour, containing yellowish brown discoloured pockets of oxidized sand and sandstone. The material is a mixture of gravel, sand and silt in varying proportions, although it commonly resembles a sandy silt or silty fine sand of low to medium plasticity. The re-worked till ranges in consistency from soft to stiff. Occasional pockets of highly plastic silty clay are present, the re-worked till is loose to medium dense. The till also contains granular inclusions of sub rounded to rounded fragments of moderately weathered sandstone, claystone and coal.*
>
> *Plastic limits of between 17% and 21% and liquid limits of between 28% and 33% were recorded in tests on two samples of the reworked till. A natural moisture content of 26% was obtained from a single sample.*

CVRI notes that the ‘samples’ mentioned as ‘re-worked till’ were reported in an 1982 report so that further inspection or description of the material is not possible.

The inclusion of the data from these reports was presented as a ‘summary’ of information available from the existing CVM area and the proposed Project area. A reasonable ‘correlation’ between the two areas can be drawn so that current geotechnical design parameters can be reasonably expected to fit at the Project.

CVRI further indicates (SIR #212) that additional geotechnical testing for pit and dump design purposes will be undertaken to support future 'licence' applications. Material classification for such testing will follow Unified Soil Classification System (USCS) standards.

4.3 Health Canada

41. Supplemental Information Request Responses, Response 213, Page 365.

CVRI states that at some locations, for some compounds, air emission values are higher for Project Case 2 than for Project Case 1, even though Project Case 1 was used in the assessment as the worst-case air quality scenario.

a) Revise the assessment using Project Case 2 air emission values when they are higher than Project Case 1.

Response:

Surface mining is continuous process and the location of mining activity changes constantly. It is not reasonable to assess the air quality associated with a mining operation by modelling it in its entirety.

The CRVI air quality assessment chose two cases to estimate air quality that would be considered reasonably worst case for the community of Robb: Case 1: West Mine in 2034 and Case 2: Main Mine in 2025. These cases were modelled with five years of meteorological data; whereas, the actual mine operations will move continuously and will not affect the community for the full five years. Thus, the approach taken was conservative for the community of Robb.

In the response to SIR #213 (Table 213-1) it was identified that in most cases, Case 1 predictions were higher than Case 2 predictions, supporting the use of Case 1 as the primary case for the assessment.

Table 41-1 summarizes the cases when Case 2 predictions are higher than Case 1 results. Predictions are summarized for MPOI, and the highest prediction at Robb. Predicted concentrations are remain below the ESRD AAAQOs, except for PM_{10} and TSP predictions which were above the AAAQOS in Case 1.

Table 41-1 Modelling Results (µg/m3) for Cases When Project Case 2 Values are Higher than Project Case 1 Values.

Compound	Case 2	Case 1	Maximum	ESRD AAAQO
NO_2 – Annual at MPOI	33	14	33	45
Unmitigated Particle Predictions				
$PM_{2.5}$ – 2nd Highest Daily at MPOI	26	21	26	30
PM_{10} – 2nd Highest Daily at MPOI	140	117	140	50
PM_{10} – 2nd Highest Daily Maximum at Robb	117	107	117	50
TSP – 2nd Highest Daily at MPOI	271	252	271	100
Mitigated Particle Predictions				
$PM_{2.5}$ – 2nd Highest Daily at MPOI	11	10	11	30
PM_{10} – 2nd Highest Daily at MPOI	47	41	47	50
PM_{10} – 2nd Highest Daily Maximum at Robb	41	39	41	50
TSP – 2nd Highest Daily at MPOI	92	87	92	100

Conclusion

Using Case 2 predictions rather than Case 1 does not change the main conclusions of the air quality assessment.

42. Supplemental Information Request Responses, Response 215, Page 367.

According to the National Pollutant Release Inventory, the benzo(e)pyrene, dibenz(a,h)acridine, phosphorus, and sulphuric acid are emitted by this industrial sector/facility and are not emitted from project fugitive sources or from diesel combustion.

a) Identify and describe the other project sources that emit benzo(e)pyrene, dibenz(a,h)acridine, phosphorus, and sulphuric acid.

Response:

Sulphuric acid is listed in the National Pollutant Release Inventory (NPRI) (2011) as substance which could, potentially, be released from the Coal Valley Coal Processing Plant (Plant). It is listed as manufactured for on-site use/processing. No sulphuric acid was released from the Plant in 2008, 2009, 2010, and 2011. Moreover, according to NPRI (2011) sulphuric acid was mainly released in oil sands upgraders, coal burning power plants, refineries, pulp mills, fertilizer plants, or food processing plants.

No phosphorus was released to air from the Plant in 2011 (NPRI, 2011). About 88 tonnes (t) of phosphorus was released to land (81.5 t was released to waste rock and 6.5 t to tailings). In previous years phosphorus was released to tailings (104 t in 2010, 113 t in 2009 and 76 t in 2008). There was no emission of phosphorus to atmosphere listed in NPRI.

There is no information about emissions of benzo(e)pyrene and dibenzo(a,h)acridine in the Coal Valley NPRI submission in 2011. In 2008 to 2010 benzo(e)pyrene was released to tailings in amounts 17 to 26 kg/year. No benzo(e)pyrene was released to air.

Furthermore, there are no emission factors in AP42 for these compounds for bituminous and sub-bituminous coal combustion (U.S. EPA 1998) or from diesel exhaust (U.S. EPA 1996a,b).

43. Supplemental Information Request Responses, Response 216a, Page 368.

CVRI states that water trucks will be deployed on a continuous basis during peak traffic periods and warm weather conditions.

a) Provide specific details on the watering schedule including a discussion of:
   i. the application rate of water,
   ii. the time between applications,
   iii. traffic volume during the period and
   iv. the meteorological conditions during the period.

Response:

Details of ‘watering schedule’ are not available. Water suppression is applied on an as needed basis.

Volume 2, CR 1, Section 4.1.2, Page 26 provides a brief outline regarding water application for dust control on haul roads; ‘haul roads will be regularly watered in summer’.

In response to SIR #216, CVRI noted ‘the water trucks would be deployed on a continuous basis during peak traffic periods and warm weather conditions with decreasing frequency as traffic is reduced or cooler weather prevails’.

The response to SIR #25 also provides additional information related to ‘watering application’. This response indicates that CVRI currently has three water trucks available for road service. Two Haulpak trucks with tank capacity of 172,000 liters and one Cat 777 with a tank capacity of 90,000 l are in service. These trucks currently service approximately 72 km of active haul road, dump and pit ramps. As the operations runs on a 24 x 365 basis the water trucks are available on the same schedule.

CVRI normal practice for water applications is focused on a ‘priority’ basis:

- Safety is of primary concern. Areas of high dust conditions with heavy traffic or congested areas (loading areas, intersections) receive priority treatment.

- Waste loading benches, ROM stockpiles and public highway crossings are prioritized to be kept monitored and well watered. These sites often have high traffic, potential spillage of hauled materials, require truck maneuvering, and higher potential for interaction with other smaller equipment.
- Intersections, sharp corners, and narrow road sections are next in line as these sites may also pose safety concerns for visibility.
- Long, low traffic haul road sections are prioritized as low since traffic volume is reduced and trucks are well spaced throughout their routine haulage cycles.
- Road and dust conditions are monitored by operational staff (pit foreman) so that watering applications can be modified as required in response to site specific conditions. During some periods no watering will be required depending on weather and road conditions. At other times the foreman can assign operators to all three water trucks with specific directions on where to apply water and at what frequency. Should safety require specific operational areas may be halted until water is adequately applied.

Operational practices of note include the following:

- The water trucks are equipped with pumps and spray nozzles that enable water application to the entire road width in a single pass. The volume and rate of application provides a heavy 'wetting' of the road surface which will remain effective for several hours in normal weather conditions.
- Multiple water 'loading' stations are maintained throughout the expanse of the mining area so that water trucks can be refilled in an efficient manner. Specific water trucks may be assigned to portions of the mine where heavier traffic or vehicle numbers are working. This results in more frequent water applications in these areas.
- Active 'mining' areas such as pits, ramps and dumps are part of the advancing mining operation. Therefore, these roads and surfaces are continually changing. This results in road surface material (freshly mined rock) being renewed on a frequent basis. Fines (silt content) on these roads is generally non-existent and dust generation potential is low.
- In pit conditions often result in minor groundwater seepage or surface water collection thus keeping the 'loading faces' generally 'wet'. Truck traffic in and around these 'wet' areas result in water being 'tracked' around the active loading and dump ramps which aid in dust suppression.

Long term haul roads require frequent maintenance through grading and occasional 'resurfacing'. The resurfacing of the 'wear surface' is accomplished with application of newly mined rock. A result is that 'wear surfaces' are renewed and 'silt content' reduced.

b) US EPA 1998b suggests that surface improvements and source extent reductions (if possible) can reduce the PM10, PM2.5 and TSP levels. Will CVRI be considering these mitigative measures?

Response:

CVRI is already realizing changes that the Project offers to the current haulage practices:

- The mine areas of the Project are closer to the Plant which will result in a significant reduction in haulage. Annual ‘total vehicle kilometers travelled’ will be significantly reduced over the life of the Project.
- The Project will require construction of several new ‘main haulage’ roads. This will leave behind several of the current road systems which have been in use for decades. The new roads will be constructed to improved standards. Silt content on ‘new’ roads can be expected to be initially reduced.
- Reduced haulage distances while maintaining the same water truck fleet can provide increased availability and frequency of water application.

Additional mitigation strategies being investigated by CVRI include:

- Use of improved surfacing materials with improved durability.
  Investigations are underway to locate and test locally available rock materials which could be considered for road construction and road surfacing. The current ‘mined rock’ has a low durability (measured by California Bearing Ratio [CBR]) which results in rapid degradation and high fines content. This search for more durable materials could result in significantly reduced fines generation and hence reduce dust ‘source’.
- Strategic Placement of Water Trucks
  As design plans continue for the Project additional attention is being paid to overall road maintenance including dust control through water application. This planning includes review of strategic placement of water supply points and stationing of water trucks. ‘Satellite’ water truck ‘stations’ are being proposed to provide improved response capability and ‘decentralizing’ locations of water stations.
- Equipment Options
  CVRI is reviewing various equipment options which could be applied to the Project. These variations include replacement of truck haulage with overland conveyor systems and truck fleet replacement opportunities for reducing the fleet with replacement with larger trucks.

- Dust Suppression Products
  CVRI will continue to evaluate available dust suppression products and technology through the life of the Project and implement favorable options. To date CVRI has found existing products to be too costly or ineffective.

44. Supplemental Information Request Responses, Response 217, Page 371.

CVRI states that they will *investigate the potential for low-emission practices...*

SIR #217, Page 371 discusses air emission control of SO2/NO2/CO and notes that the 'largest source' of such emissions is blasting. The response further indicates that 'CVRI will investigate the potential for low-emission practices, including the use of greater setbacks and smaller but more frequent blasts. In particular, CVRI will review and apply to the extent feasible the code of practice developed by AEISG (2011) for reducing and managing NOX emissions from blasting, which may also have some applicability to SO2 and CO emissions'.

Therefore, the comments regarding 'investigate the potential for low-emissions practices' were limited to blasting sources.

a) Provide more detail on when these practices will be investigated including what will trigger an investigation and; under what circumstances "low emission practices" will be put into place.

Response:

The primary 'driver' regarding blasting procedures is unit operating cost. CVRI monitors production costs and remains observant of available feasible alternatives to implement measures to reduce cost. This includes managing 'blasting efficiency' to high effectiveness of the blasting process which leads to lowest unit cost.

In achieving 'high efficiency' CVRI is working toward managing for best possible blasting conditions, improved denotation, and maximum use of explosive products. This strategy fits with the 'code of practice' outlined in AEISG (2011) which advocates attention to proper explosives handling and usage with tightly controlled blasting conditions. This will lead to high efficiency in explosive combustion and minimizing of emissions.

The AEISG (2011) code of practice manual has already been distributed to engineering staff responsible for blast design and monitoring of blasting product usage. The codes of practice are being reviewed internally and considerations for 'efficiency improvements' are being addressed.

Therefore, investigations toward low-emission practices have already been 'triggered'.

b) Clarify whether Tier 4 technology will be used when it becomes available.

Response:

Tier 4 technology does not apply to 'blasting'.

However, acquisition of Tier 4 technology comes into play whenever CVRI contemplates engine replacements in existing equipment or acquisition of replacement or addition equipment. Consideration of lower emissions capability is considered in addition to engine operating and service history. In the near future, Tier 4 will be standard manufacture on all newly acquired heavy equipment.

c) Clarify whether CVRI will be implementing an air quality monitoring program to determine when additional operational controls should be applied to reduce air quality emissions.

Response:

A long-term air quality monitoring program is currently planned for the community of Robb, starting when mining operations are several years from their closest approach to the community. CVRI would use the results of that monitoring to guide the need for additional operational control, as discussed in the response to SIR #34e).

CVRI notes that the results of modeling showed that all predictions at study area maximum points of impingement and in the community were below Alberta's ambient air quality objectives.

CVRI determined that additional dustfall monitoring is recommended to assess the impact of road watering and the mitigative effect of vegetation on road dust. It is expected this program would be established at one location near the haul road near the wash plant and at a location to be determined on the haul road nearer to the community of Robb. At both locations, CVRI anticipates a number of dustfall stations installed at increasing distance from the haul road to measure the decrease in dust deposition with distance.

45. Supplemental Information Request Responses, Response 224, Page 382.

Of the 18 discrete receptor locations (denoted as R1 to R18), 4 locations are not considered in the HHRA (R10, 11, 12, and 13).

a) Clarify why all four of these locations are not considered in Table 3-2, with specific attention to R11 (in Local Study Area) and R12 (identified as a campground).

Response:

As stated in SIR Response #155 of the first round:

> *"The missing receptors (i.e., R10, R11, R12 and R13) were included in Table 3-2 and were included in the HHRA (CR #5). These receptors were included in the HHRA and are listed as R9 to R14 in Table 3-2, which includes R10, R11, R12 and R13."*