APPENDIX A

Comments on the Air Quality Impact Analysis of the Minor Permit Application for the Usibelli Wishbone Hill Coal Mining Project

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Prepared for:

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I. INTRODUCTION

Usibelli Coal Mine, Inc. (Usibelli) has submitted to Alaska Department of Environmental Conservation (ADEC) an application for a minor air permit application for the planned Wishbone Hill Coal Mining and Processing Operation. The proposed project will be located eight miles north of Palmer, Alaska. AMI Environmental (AMI) has been retained by The Friends of Mat-Su to review and comment on the air quality impact analysis of the proposed coal mining project. Qualifications of Mr. Khanh Tran, Principal of AMI, to perform the review are shown in Appendix A.

II. PROJECT DESCRIPTION

According to the ADEC Technical Analysis Report, the proposed project will emit NO_x (67.8 tons per year), PM_{10} (557.2 tpy) and SO2 (0.1 tpy). The Usibelli Permit Application has reported lower PM10 emissions of 495.8 tpy. NOx emissions are mainly emitted by a 900-hp IC engine and two heaters rated at 10 MMBtu/hr. PM10 emissions are from fugitive dust sources associated with coal mining and processing.

The proposed project will be located eight miles north of Palmer, Alaska. The project's surrounding area is classified as PSD Class II and is currently designated as attainment or unclassified for all regulated pollutants: nitrogen dioxide (NO_2), sulfur dioxide (SO_2), carbon monoxide (CO), particulate matter less than 10 microns in aerodynamic diameter (PM_{10}), fine PM (PM2.5), lead and ozone.

III. REVIEW METHODOLOGIES

AMI's review has focused on the documents prepared by ADEC and the applicant Usibelli. Below is a list of the documents and modeling data that have been reviewed:

ADEC Preliminary Decision Approving WB Air Permit (March 11, 2011)
ADEC Technical Analysis Report for WB Air Permit
Usibelli Wishbone Hill Minor Air Permit Application

AERMOD Modeling Input and Output Files

IV. COMMENTS ON AIR QUALITY MODELING

Comment #1: Project PM10 emissions exceed the threshold for a PSD major source

The ADEC Technical Analysis Report (TAR) shows that the project will emit 557.2 tpy of PM10. This emissions total exceeds the emission threshold of 250 tpy for a major source under the Prevention of Significant Deterioration (PSD) program. However, Usibelli has submitted a Minor Source Permit Application because "the Permittee stated that they will not be using thermal dryers to dry the coal. If the Permittee does use thermal dryers at some point in the future, the stationary source would then require review under 40 CFR 52.21 as a PSD major source". (ADEC TAR, page 7).

Thus, if the proposed project includes the use of thermal dryers, Usibelli should submit a PSD Permit Application that requires more stringent emission controls and impact analyses than a Minor Source Permit Application, e.g. best available control technology (BACT) and PSD Class I impact analyses.

Comment #2: PM10 emissions in the Permit Application are underestimated by 61.4 tpy

The Usibelli Permit Application has stated that total PM10 emissions will be 495.8 tpy, while the ADEC Technical Analysis Report (TAR) has shown them to be 557.2 tpy. Thus, PM10 emissions in the Permit Application are underestimated by 61.4 tpy. This difference is due to the omission of offsite sources-coal truck haul-access road (Source #36) in the Permit Application (ADEC TAR, page 13).

Comment #3: Modeled PM10 emissions are underestimated by omitting offsite traffic emissions

As shown in Comment#2, the Permit Application has omitted PM10 emissions from offsite coal truck haul on access roads. These PM10 emissions are very large (61.4 tpy). They have been omitted in the AERMOD modeling and, hence, the modeled PM10 impacts are underestimated. At a minimum, emissions from offsite access roads located within a few miles of the project site should be included in the modeling.

Comment #4: Project PM10 impacts are underestimated by using particle deposition

Particle deposition has been used in the AERMOD modeling to model PM10 impacts. Since project emissions are already PM10, it is not necessary to model particle deposition which only underestimates project impacts.

Comment #5: The onsite meteorological data is not acceptable for modeling due to large number of hours with missing data

A review of the onsite meteorological data used in the AERMOD modeling indicates that it has 3,538 hours with missing data (40.39% of possible 8,760 hours). Thus, this onsite data is not acceptable for use in modeling since it is missing more than 10% of possible hours. The ADEC Modeling Review Procedures Manual states on page 63 that *the EPA Meteorological Monitoring Guidelines requires a minimum of 90 percent valid data capture per quarter, on a joint recovery basis for wind speed, direction, and other relevant parameters. These data capture requirements apply to raw data and do not allow for missing data substitution to achieve the 90 percent requirement (except from equivalent backup sensors at the monitoring station)* (ADEC, 2006; USEPA, 2000).

Comment #6: Project impacts are severely underestimated by the large number of calm hours in the onsite meteorological data

In addition of a large number of hours with missing data (3,538 hours) as stated above, the onsite meteorological data has 2,445 hours of calm hours (27.91% of possible 8760 hours). Project PM10 impacts are primarily from surface emission sources such as open pit, topsoil removal and vehicular traffic. Thus, maximum impacts are expected to occur near the project site under calm conditions with low wind (less than 1 m/s) and stable conditions. However, the AERMOD model ignores these calm hours since it does not calculate concentrations for these hours and, hence, project impacts have been severely underpredicted.

Comment #7: Alternative meteorological data should be used in modeling

As discussed in Comments #2 and 3 above, the large numbers of hours with missing data or calm conditions have made the onsite data unacceptable for modeling. As an alternative, current site-specific meteorological data should be collected or data at the Palmer Airport should be used in the AERMOD modeling. As recommended by USEPA Modeling Guidelines (USEPA, 2005), five years of data at the Palmer Airport should be used.

Comment #8: Receptor grid is too coarse to capture maximum impacts

As stated in the Permit Application, the AERMOD modeling used a 50 meter (m) spacing around the boundary of Wishbone Hills and along the public trails that transect the ambient boundary. The receptor grid is also extended outward about 200 m at 100 m spacing from the Wishbone Hills boundary. In its Modeling Review Procedures Manual, ADEC has recommended that a 25 meter spaced grid be placed around the receptor with the maximum impact to ensure that the maximum has truly been defined. Thus, the AERMOD model should be rerun with additional receptors with a 25-m spacing placed around the maximum receptors that have been predicted for NO2 and PM10.

Comment #9: Project PM10 impacts have been underestimated by using the second highest concentration and will exceed the NAAQS with the maximum concentration

The ADEC Technical Analysis Report shows in Table 3 that the 24-hour PM10 predicted impact of 141.7 ug/m3 (113.2 ug/3 from project + 28.5 ug/m3 from background) is close to exceed the 24-hour NAAQS of 150 ug/m3. The modeled project concentration of 113.2 ug/m3 is the second highest predicted by the AERMOD model. The maximum project-only concentration predicted by AERMOD is 135.17 ug/m3. With this project-only maximum concentration and a background of 28.5 ug/m3, project impact is 163.7 ug/m3 (135.17 ug/m3 from project + 28.5 ug/m3 from background) which largely exceeds the NAAQS of 150 ug/m3. In a March 2010 memo from the Director of OAQPS regarding *Modeling Procedures for Demonstrating Compliance with PM2.5 NAAQS*, US EPA has recommended the use of the maximum highest 24-hour concentration predicted in modeling with one year of onsite meteorological data (US EPA, 2010). According to US EPA, the use of the maximum concentration is designed to avoid the underestimation of impact. It should be noted that violations of the 24-hour NAAQS have been recorded at Anchorage in recent years (e.g., 233 ug/m3 in 2008 and 223 ug/m3 in 2007 according to the US EPA Air Data website, http://iaspub.epa.gov/airsdata/adaqs.monvals?geotype=st&geocode=AK&geoinfo=st~AK~Alaska&pol=PM10&year=2007&fld=monid&fld=siteid&fld=address&fld=city&fld=county&fld=stabbr&fld=regn&rpp=25)

Comment #10: Regional sources should be included in a cumulative impact analysis

The ADEC Technical Analysis Report shows in Table 3 that the 24-hour PM10 predicted impact of 141.7 ug/m3 (113.2 ug/3 from project + 28.5 ug/m3 from background) is close to exceeding the 24-hour NAAQS of 150 ug/m3. The Permit Application has not performed a cumulative impact analysis with other nearby sources. Thus, an emissions inventory of nearby sources should be prepared and their PM10 emissions included in a cumulative impact modeling with the AERMOD model.

Comment #11: Project 1-hour NO2 impacts have not been modeled

The Permit Application does not show any modeling analysis of 1-hour NO2 impacts. On January 25, 2010 US EPA has promulgated a new 1-hour NO2 national ambient air quality standard (NAAQS) of 100 ppb (or 188 ug/m3). Thus, a modeling analysis with the AERMOD shall be performed for 1-hour NO2 and the predicted impacts shall be compared against the 1-hour NO2 standard.

Comment #12: Project PM2.5 emissions have not been quantified

The proposed project will emit a large amount of PM10 (495.8 tpy according to the Usibelli Permit Application and 557.2 tpy according to the ADEC Technical Analysis Report). However, both these documents do not show any emission calculations for fine

particles (PM2.5), i.e. those with diameter less than 2.5 microns. The US EPA has promulgated PM2.5 NAAQS for 24-hour and annual averages. Thus, the Permit Application should present the PM2.5 emissions from all project sources.

Comment #13: Project PM2.5 impacts have not been modeled and can exceed the 24-hour NAAQS

The Usibelli Permit Application and the ADEC Technical Analysis Report do not show any modeling analysis of fine particles (PM2.5). The US EPA has promulgated PM2.5 NAAQS of 35 ug/m3 for 24-hour average and 15 ug/m3 for annual average. In recent years, the 24-hour NAAQS has been exceeded by measurements at the Anchorage station (maximum 40.7 ug/m3 and 98th percentile 31.1 ug/m3 in 2008, maximum 52.5 ug/m3 and 98th percentile 39.6 ug/m3 in 2007, maximum 51.9 ug/m3 and 98th percentile 42.2 ug/m3 in 2006). The annual measurements in Anchorage are also high (8.65 ug/m3 in 2008, 11.05 ug/m3 in 2007, 14.36 ug/m3 in 2006)
http://iaspub.epa.gov/airsdata/adaqs.monvals?geotype=st&geocode=AK&geoinfo=st~AK~Alaska&pol=PM25&year=2007&fld=monid&fld=siteid&fld=address&fld=city&fld=county&fld=stabbr&fld=regn&rpp=25

Thus, with a high background concentration, project PM2.5 impact is expected to exceed the 24-hour NAAQS. The Permit Application should present a modeling analysis of the PM2.5 24-hour and annual impacts from all project sources. The AERMOD model can be used in this analysis and the predicted impacts shall be compared against the applicable NAAQS.

Comment #14: Project ozone impacts have not been addressed

The proposed project will emit NOx (67.8 tpy) and VOC (0.7 tpy). Known as ozone precursors, these emissions will react under sunlight to form ozone. The Permit Application has not addressed the project ozone impacts. The proposed project will add to ozone levels in the region and may interfere with the attainment or maintenance of ozone standard. It should be noted violations of the current 8-hour ozone standard of 0.075 ppm have been recorded in Denali National Park (0.076 ppm in 2008 http://iaspub.epa.gov/airsdata/adaqs.monvals?geotype=st&geocode=AK&geoinfo=st~AK~Alaska&pol=O3&year=2008&fld=monid&fld=siteid&fld=address&fld=city&fld=county&fld=stabbr&fld=regn&rpp=25). Further, the US EPA has announced that the current 8-hour average ozone standard of 0.075 ppm may be lowered to 0.06-0.07 ppm.

Comment #15: Plume blight from project sources have not been modeled

Project sources emit significant amounts of NOx (67.8 tpy) and PM10 (557.2 tpy) that are known to reduce visibility. The VISCREEN model developed by the EPA should be used to analyze local visibility effects of project sources.

V. REFERENCES

Alaska DEC, 2006. ADEC Modeling Review Procedures Manual Available at http://www.dec.state.ak.us/AIR/ap/docs/mpm_10-03-06.pdf

US EPA, 2010. *Modeling Procedures for Demonstrating Compliance with PM2.5 NAAQS*. Memo dated March 23, 2010 from Stephen D. Page, Director of Office of Air Quality Planning and Standards. Available at http://www.epa.gov/ttn/scram/Official%20Signed%20Modeling%20Proc%20for%20Demo%20Compli%20w%20PM2.5.pdf

US EPA, 2005. *Revisions to the Guidelines on Air Quality Models*. 40 CFR Part 50. Federal Register, vol. 70, no. 216. November 9, 2005. Available at: http://www.epa.gov/scram001/guidance/guide/appw_05.pdf

US EPA,2000. Meteorological Monitoring Guidance for Regulatory Modeling Applications" (EPA-454/R-99-005). Available at http://www.epa.gov/scram001/guidance/met/mmgrma.pdf

US EPA, 1990. *New Source Review Workshop Manual – PSD and Nonattainment Area Permitting*. Draft October 1990. Available at: http://www.epa.gov/ttn/nsr/gen/wkshpman.pdf

APPENDIX A

Qualifications of Khanh T. Tran

Mr. Khanh Tran is the owner and Principal Scientist of AMI Environmental since its establishment in 1980. He has over 30 years of experience in project management, meteorological modeling, air quality modeling, emissions inventory and visibility analysis. He has successfully managed over 200 air quality studies conducted by AMI on behalf of government agencies (including US Department of Energy, Bureau of Land Management, Minerals Management Service, Arizona Department of Environmental Quality, California Energy Commission and California South Coast Air Quality Management District) as well as large utilities (including Duke Power, Los Angeles Department of Water and Power and Southern California Edison) and oil companies (including Arco, Occidental Petroleum and Texaco).

Mr. Tran received his B.S. (1973) and M.S. (1974) degrees in Mechanical Engineering from the University of California, Santa Barbara. From 1978-1980, he completed graduate courses in Atmospheric Sciences, Computer Sciences and Environmental Fluid Dynamics at UCLA. In 1978, he also developed a predictive atmospheric modeling system for real-time emergencies as part of his Ph.D. research at UCLA. Mr. Tran is a former member of the National Committee on Meteorological Aspects of Air Pollution of the American Meteorological Society.

Mr. Tran has extensive experience in the development, evaluation and application of air quality simulation models, from simple Gaussian dispersion models (AERMOD, CALPUFF, ISCST3) to complex photochemical grid models (UAM, CAMx, Models3/CMAQ). He has also developed air quality models that have received approval from regulatory agencies. He has performed a wide variety of air quality modeling studies, including:

- He has recently reviewed the air quality and visibility impact analyses that have been performed as part of PSD permit applications of proposed coal-fired power plants in Georgia (Longleaf and Washington), Idaho (Power County), Kentucky (Trimble), Montana (Highwood), Nevada (Ely), New Mexico (Desert Rock), Ohio (AMP), Michigan (Consumers and Wolverine), South Dakota (Hyperion), Virginia (Virginia City Hybrid) and Wyoming (Dry Fork and Medicine Bow). He has performed AERMOD, ISCST3 and CALPUFF modeling to verify the results documented in the PSD permit applications and predict air quality and visibility impacts from alternative emissions scenarios.

- He has applied the photochemical model CAMx to predict ozone impacts in Houston from the proposed White Stallion coal-fired power plant. He has also

used the CAMx model to assess cumulative ozone impacts of Texas existing and new coal-fired plants in neighboring states such as Arkansas and Oklahoma.

- He has performed a comparative study of short-range dispersion models (ISCST3, ISC-PRIME and AERMOD). He has extensive experience in applying these models to air quality impact analyses for power plants, oil refineries and other facilities. He had applied Gaussian-based models to proposed coal leases by the Bureau of Land Management in New Mexico. He had used the ISCST3 model to assess potential impacts of several proposed gas-fired power plants in California.
- He modified and applied the long-range transport MESOPUFF (a predecessor of CALPUFF) to coal development projects in Utah and North Dakota. As part of these project EIS, he had performed visibility modeling to assess potential impacts of end-use facilities (e.g. power plants) at nearby PSD Class I areas.
- He developed the diagnostic wind module that has been included in the preprocessor CALMET of the CALPUFF model.
- He developed PC-based versions of the MM5 model, and applied the model to air quality modeling studies, e.g. the 1997 Southern California Ozone Study (SCOZ). He also modified the MM5 model to provide Web-based real-time weather forecasts for wind energy plants in California and Texas as well as tropical storms in Southeast Asia.
- He had developed the photochemical trajectory model TRACE and applied to power plant siting (e.g. the Lucerne Valley generating station for Southern California Edison) and offshore oil and gas development in California. He also applied other photochemical grid models to the development of ozone air quality attainment plans (AQAP) for Santa Barbara County, San Diego County and Kern County in California, and the Phoenix metropolitan area of Arizona. He recently applied the Urban Airshed Model to predict ozone impacts from proposed power plants in southern California and Phoenix.
- He developed the multipathway risk assessment model ACE2588 that has become widely used in over 1000 facilities under California's air toxics regulations (AB 2588). The ACE2588 model has also been used in other states and foreign countries. He improved the ACE2588 model to include a Monte Carlo uncertainty analysis to provide more realistic risk estimates.
- He developed the ACEHWCF model that implements the U.S. EPA health risk assessment guidelines for hazardous waste combustion facilities.
- He was in charge of prioritizing over 800 air toxics facilities in the Los Angeles air basin, reviewing and modifying their risk assessments submitted under the California Air Toxics Hot Spots AB 2588.
- He completed the development of a comprehensive emission inventory of over 10,000 point sources, including power plants, for regional exposure modeling of air toxics in the Los Angeles area.
- He has also used several dispersion models ranging from simple Gaussian puff to multiphase, dense gas models (e.g., DEGADIS and SLAB) to simulate accidental releases of hazardous chemicals.

AERMOD Modeling of PM-10 Impacts of the Proposed Usibelli Wishbone Hill Coal Mining Project

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I. INTRODUCTION

Usibelli Coal Mine, Inc. (Usibelli) has submitted to Alaska Department of Environmental Conservation (ADEC) an application for a minor air permit application for the planned Wishbone Hill Coal Mining and Processing Operation (ADEC, 2011). The proposed project will be located eight miles north of Palmer, Alaska. It has the potential to emit (PTE) 557.2 tons per year (tpy) of particulate matter less than 10 microns in diameter (PM-10). AMI Environmental (AMI) has been retained by Mat-Valley Coalition to perform a modeling analysis of the 24-hour PM-10 impacts of the proposed coal mining project. PM-10 impacts have been modeled with the latest version 11103 of the regulatory model AERMOD (US EPA, 2011). The model was applied to the following three modeling scenarios:

1. The AERMOD model was run with particle deposition and the same modeling inputs (emissions, receptors, 1990 onsite meteorological data) that were used by Usibelli in the permit application and available online at http://www.dec.state.ak.us/air/ap/docs/AQ1227MSS03_Modeling_Files.zip This AERMOD run was designed to verify the PM-10 modeling results obtained by Usibelli.

2. Particle deposition is the process by which particles collect or deposit themselves on the ground, decreasing their concentration in the air. Deposition is most effective for large particles since they settle out quickly through gravitational settling or impaction processes. Thus, particle deposition deposits the PM-10 emissions on the ground as they travel to the receptors and PM-10 concentrations at these receptors will be less than those without deposition. For modeling particle deposition, Usibelli assumed large mass fractions for large particles (30 microns in diameter), e.g. 80% for overburden removal, topsoil removal and open pit mining; and 60% for mobile operations and road hauling. In the second AERMOD run, particle deposition (both wet and dry) was turned off and all other modeling inputs remained the same as in the first scenario. This second scenario was designed to assess the effects of turning off particle deposition since the project emissions were calculated for PM-10 using AP-42 emission factors that are adjusted for PM-10. Particle deposition is normally not simulated for PM-10 or PM2.5 since its effects are negligible for small particles. It is used for particles larger than PM-10 such as PM-30 if emissions are calculated for total suspended particulates (TSP). Thus, using large mass fractions for PM-30 and particle deposition for strictly PM-10 emissions can largely underestimate their impacts.

3. A major source of uncertainty is the use of an onsite meteorological data set gathered in 1990. This onsite data set has excessive numbers of hours with either missing data or calm winds. In the previous modeling in March 2011, this data set had 3,538 hours with missing data (40.39% of possible 8,760 hours) which invalidated its use in dispersion modeling. Usibelli had recently revised this data by including the cloud cover data from the nearby Palmer airport and had reduced the missing hours to an acceptable number (664 hours or 7.58%). The number of

calm hours, however, is still excessive (2,401 hours or 27.41% of possible 8,760 hours). It is known that high PM-10 impacts from low-level mining sources occur under poor dispersion conditions such as low winds and that the AERMOD model does not calculate concentrations under calm conditions by assigning a zero concentration for calm hours. Thus, impacts predicted by AERMOD can severely be underestimated.

In the third modeling scenario, surface data measured during the most recent five years (2006-2010) at the nearby Palmer Municipal Airport and the upper-air data from Anchorage International Airport were processed by the AERMET program which is the meteorological preprocessor of the AERMOD model. The Palmer airport is an ASOS (automated surface observing system) station that has 1-minute average wind data. Using this 1-minute wind data can substantially reduce the number of calm hours and, hence, enhances the accuracy of the AERMOD model predictions. In this modeling study, the preprocessor AERMINUTE developed by the US EPA was used to process the 1-minute wind data that was included as part of Stage 2 of the preprocessor AERMET.

II. MODELING RESULTS

Results of the first AERMOD run that used particle deposition and the same modeling inputs of the Usibelli run are presented Table 1. The 2nd highest concentration of 80.1 ug/m3 matches the result obtained by Usibelli and shown in Table 5 of the ADEC Technical Analysis Report (ADEC, 2011). With a background of 28.5 ug/m3, both the maximum and 2nd highest total concentrations are below the 24-hour national ambient air quality standard (NAAQS) of 150 ug/m3.

The effects of turning off particle deposition are presented in Table 2. Without particle deposition, the AERMOD model has predicted a 2nd highest concentration of 243.9 ug/m3 which is 3 times larger than the above concentration of 80.1 ug/m3. The predicted 2nd highest concentration of 243.9 ug/m3 from the Usibelli project emissions alone largely exceeds the NAAQS of 150 ug/m3. With a background of 28.5 ug/m3, this NAAQS is exceeded by both the maximum total concentration of 308.7 ug/m3 and the second highest total concentration of 272.4 ug/m3.

As mentioned above, meteorological data from the Palmer Municipal Airport include 1-minute wind data that are designed to reduce calm conditions. As shown in Table 3, the total number of calm hours in the processed 2006-2010 data is 1,403 hours, which is far less than the total of 2,401 hours in the 1990 onsite data. Maximum 24-hour concentrations predicted by the AERMOD model range from 231.8 ug/m3 in 2007 to 287.5 ug/m3 in 2009. The second highest concentrations range from 176.8 ug/m3 in 2006 to 223.9 ug/m3 in 2008. Without the background, all these maximum and second highest concentrations largely exceed the NAAQS of 150 ug/m3. Of particular note, the second highest concentration of 223.9 ug/m3 in 2008 corresponds to the 6th highest concentration that is used for comparing with the NAAQS when modeled with five years

of meteorological data. With the background of 28.5 ug/m3, the total concentration of 272.4 ug/m3 largely exceeds the NAAQS of 150 ug/m3.

Table 1. Predicted PM10 Impacts WITH Particle Deposition (1990 Onsite Data)

Pollutant	Project Conc. With Deposition (ug/m3)	Backgr. Conc. (ug/m3)	Total Conc. (ug/m3)	NAAQS (ug/m3)	NAAQS Exceeded?
24-hour PM10 (max)	86.5	28.5	196.3	150	NO
24-hour PM10 (2nd high)	**80.1**	**28.5**	**138.1**	**150**	**NO**

Table 2. Predicted PM10 Impacts WITHOUT Particle Deposition (1990 Onsite Data)

Pollutant	Project Conc. Without Deposition (ug/m3)	Backgr. Conc. (ug/m3)	Total Conc. (ug/m3)	NAAQS (ug/m3)	NAAQS Exceeded?
24-hour PM10 (max)	280.2	28.5	308.7	150	**YES**
24-hour PM10 (2nd high)	**243.9**	**28.5**	**272.4**	**150**	**YES**

Table 3. Numbers of Calm Hours and Missing Hours in Palmer 2006-2010 ASOS data

Modeled Year	Number of Calm Hours	Number of Missing Hours
2010	195	177
2009	70	280

2008	266	532
2007	48	994
2006	824	341
Total	**1,403**	**3,313**

Note: The 1990 onsite data has 2,401 calm hours.

Table 4. Predicted PM0 Impacts WITH Particle Deposition (Palmer 2006-2010 ASOS data)

Modeled Year	Project Conc. (ug/m3)	Background Conc. (ug/m3)	Total Conc. (ug/m3)	NAAQS (ug/m3)	NAAQS Exceeded?
2010 (max)	265.2	28.5	293.7	150	**YES**
2010 (2nd high)	215.8	28.5	244.3	150	**YES**
2009 (max)	287.5	28.5	316.0	150	**YES**
2009 (2nd high)	219.3	28.5	247.8	150	**YES**
2008 (max)	252.5	28.5	281.0	150	**YES**
2008 (2nd high)	**223.9**	**28.5**	**252.4**	**150**	**YES**
2007 (max)	231.8	28.5	260.3	150	**YES**
2007 (2nd high)	195.0	28.5	223.5	150	**YES**
2006 (max)	256.4	28.5	284.9	150	**YES**
2006 (2nd high)	176.8	28.5	205.3	150	**YES**

III. CONCLUSIONS

PM-10 impacts as reported in the ADEC TAR for the proposed Usibelli Wishbone Hill coal mining project have been shown to be severely underestimated by the above modeling analysis. With particle deposition turned off, maximum project 24-hour PM-10 concentration increases from 80.1 ug/m3 (with deposition) to 243.9 ug/m3 (without deposition) and largely exceeds the NAAQS of 150 ug/m3. With the 2006-2010 meteorological data from the Palmer Airport that include the 1-minute wind data to reduce the number of calm hours, the AERMOD model has predicted a project maximum 24-hr concentration of 223.9 ug/m3 that also exceeds the NAAQS. Thus, PM-10 impacts from the proposed project will be very significant since they will cause large exceedances of the 24-hour PM-10 NAAQS.

IV. REFERENCES

Alaska DEC, 2011. Draft Technical Analysis Report for Air Quality Control Minor Source Permit AQ1227MSS03 – Usibelli Wishbone Hill Coal Mining and Processing Operation. August 11, 2011.

U.S. EPA, 2011. Addendum to User's Guide for the AMS/EPA Regulatory Model – AERMOD – version 11103. Available at http://www.epa.gov/ttn/scram/models/aermod/aermod_userguide.zip