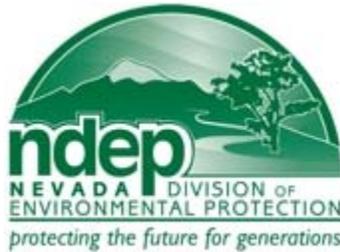


CYANCO COMPANY

**Class I (Title V) Air Quality Operating Permit - Minor Revision
Air Case 09AP0026**

**Permit AP2819-0886.01
FIN A0009**



BY

**MATTHEW DEBURLE
ENVIRONMENTAL ENGINEER**

**STATE OF NEVADA
DEPARTMENT OF CONSERVATION AND NATURAL RESOURCES
DIVISION OF ENVIRONMENTAL PROTECTION
BUREAU OF AIR POLLUTION CONTROL**

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1.0 INTRODUCTION

CYANCO Company (Cyanco) is located at 5505 Cyanco Drive in Winnemucca, Nevada. The facility is approximately seven miles west of Winnemucca, off Jungo Road in Section 6, T35N, R37E, Hydrographic Area 70. This area is designated attainment for particulate matter and unclassified for all other criteria pollutants.

Cyanco submitted a Class I minor modification application on July 21, 2008, for a minor revision to their existing Class I (Title V) air quality operating permit. The minor revision application's draft permit conditions were reviewed and revised pages were received on August 15, 2008 by the Nevada Division of Environmental Protection - Bureau of Air Pollution Control (NDEP-BAPC). Pursuant to NAC 445B.3425(3)(b), a copy of the Minor Revision application is being sent to the Environmental Protection Agency on August 22, 2008. In this minor modification, Cyanco proposes the following modifications/revisions from the current/existing operating permit:

Plant #1 (West Plant):

- Replacement of existing Thermal Oxidizer (TO-1) with new TO with a heating capacity rating of 48 MMBtu/hr;
- Optimize and/or replace existing neutralizer/mixer;
- Replacement of 250 HP motor with new 300 HP motor on the process of air compressor;
- Oxygen enrichment to increase NaCN production rate;
- Specific operating permit condition changes from the existing permit; and
- Corrections to emission calculation quantifications from the previous Class I air quality renewal permit application submittals in 2006.

Plant #2 (East Plant):

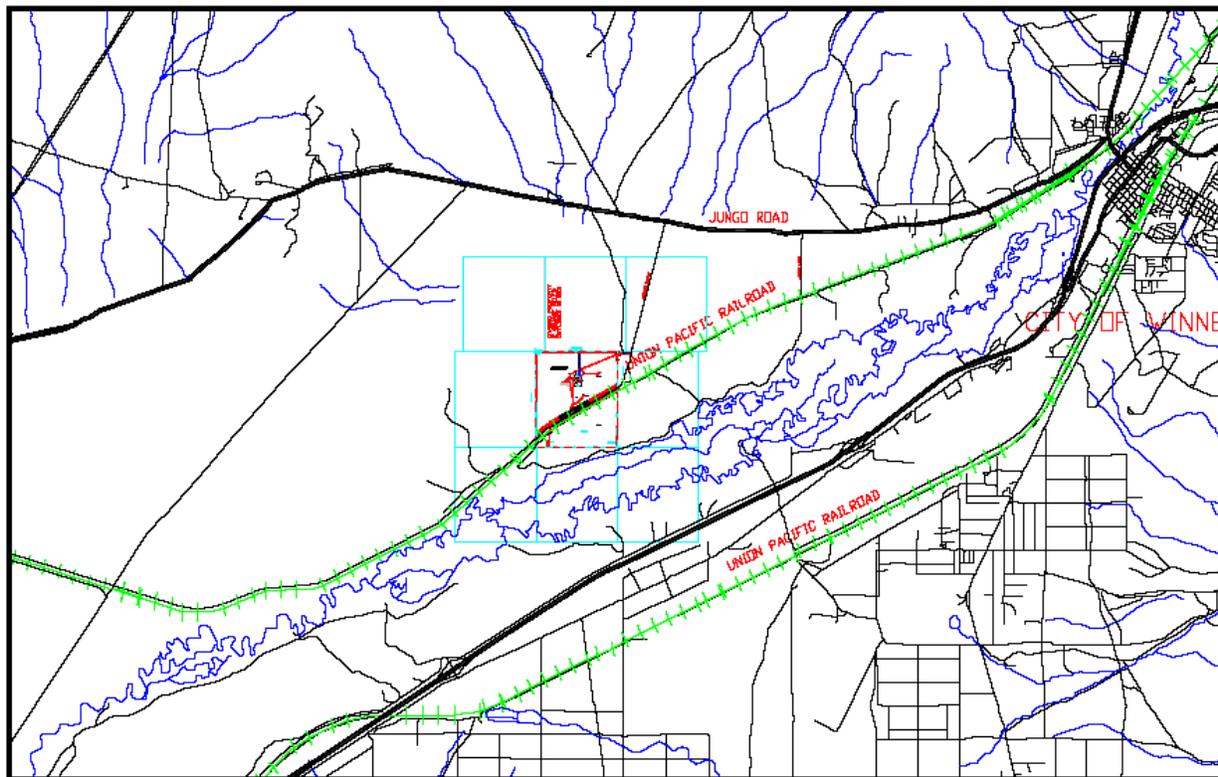
- Optimize and/or replace existing neutralizer/mixer;
- Oxygen enrichment to increase NaCN production rate;
- Specific operating permit condition changes from the existing permit conditions; and
- Corrections to emission calculation quantifications from the previous Class I air quality renewal permit application submittals in 2006.

Cooling Tower:

- Installation of additional fin tube cooling exchangers

The BAPC case log number for this application is 09AP0026. The facility consists of two sodium cyanide production plants, and is currently permitted under Class I Air Quality Operating Permit AP2819-0886.

Map of Cyanco



1.0 PROPOSED MODIFICATIONS

1.1 Replacement of Thermal Oxidizer (TO) at the Plant #1:

Due to current/ future market demand of NaCN, Cyanco is proposing to replace the existing TO (heat input design capacity of 2.5 MMBtu/hr, considering natural gas only) with a new TO (heat input design capacity of 56 MMBtu/hr for waste gas and natural gas combined). Note that heat input design capacity of 56 MMBtu/hr is the summation of the natural gas auxiliary burner (10 MMBtu/hr) and waste gas being combusted (46 MMBtu/hr). Previously the waste gas component was not included in the total heat input, however, emissions from all gases burned have always been considered. Cyanco asserts that the replacement of the TO will likely result in an improvement of the process control, which will reduce the oxides of nitrogen (NO_x) emissions from the Cyanco Plant #1.

1.2 Optimize and/or Replace Existing Neutralizer/ Mixer at the Plant #1 and Plant #2:

By optimizing and/or replacing the existing Neutralizer/Mixer at the Plant #1 and Plant #2, Cyanco intends to improve the conversion of Hydrogen Cyanide (HCN) to Sodium Cyanide (NaCN). Since less HCN will enter the waste gas stream for combustion, Cyanco will be able to achieve a reduction in the NO_x emissions and an increase in NaCN production. This will also help Cyanco to reduce the HCN emissions from both plants (Plant #1 and #2).

1.3 Replacement of 250 HP motor with New 300 HP Motor for Process Air Compressor at Plant #2:

Cyanco is proposing to replace the existing 250 HP motor with a new 300 HP motor for the use of air compressor at the Plant #1. With this replacement, Plant #1 process will have the same air supply capability as the Plant #2 process.

1.4 Oxygen Enrichment at the Plant #1 and Plant #2:

Cyanco is proposing to add oxygen into the Plant #1 and Plant #2 processes to increase the NaCN production to meet the current and anticipated future NaCN market demands. Oxygen enrichment was previously permitted for Plant #1 in 1996.

1.5 Decommission of PSA Flare:

Cyanco is proposing to decommission the existing flare system from the permit. Previously, this flare had been used to burn reject natural gas from the pressure swing absorption (PSA) unit. Cyanco has not been using this flare for such purpose for a while and wishes to decommission the flare unit. With this modification, Cyanco proposes to re-route reject natural gas feed through TO-1 and/or TO-2.

2.0 APPLICABLE REQUIREMENTS

Applicable requirements are those regulatory requirements that apply to a stationary source or to emissions units contained within the stationary source. In Nevada's program, the regulations governing the emissions of air pollutants from which the applicable requirements originate are derived from four categories of regulations. These four categories consist of the requirements contained in the Nevada Revised Statutes (NRS), the Nevada Administrative Code (NAC), the Applicable State Implementation Plan (ASIP), and the Code of Federal Regulations (CFR, contained in various Parts within Title 40).

2.1 GENERALLY APPLICABLE REQUIREMENTS

Of the four categories of regulations governing emissions of air pollutants, there are many generally applicable requirements that apply to stationary sources and emission units located at a stationary source. A comprehensive summary of applicable permit requirements is contained in Sections I through V of the Title V air quality operating permit.

2.2 SPECIFIC APPLICABLE REQUIREMENTS

Nevada Revised Statutes

The Nevada Revised Statutes (NRS) is the statutory authority for the adoption and implementation of administrative regulations. The statutes relating to the control of air pollution are contained in NRS 445B.100 through 445B.640. The NRS specifies that the State Environmental Commission is the governing body given the power to adopt administrative regulations. Because the NRS is the enabling statutory authority, very few specific requirements

are contained in the statutes. Rather, the NRS provides, generally, broad authority for the adoption and implementation of air pollution control regulations.

Nevada Administrative Code

The Nevada Administrative Code, (NAC), is a collection of administrative regulations that contain specific requirements relating to the control of air pollution. The State Environmental Commission adopts these regulations. The NAC requires that, where state regulations are more stringent in comparison to Federal regulations, the State regulations are applicable. The NAC sets forth, by rule, maximum emission standards for visible emissions (opacity), PM₁₀ and sulfur emitting processes. Other requirements are established for incinerators, storage tanks, odors and maximum concentrations of regulated air pollutants in the ambient air. Other NAC regulations specify the requirements for applying for and method of processing applications for operating permits. All of the equipment considered in this application must meet, at a minimum, the applicable standards and requirements set forth in the NAC. Specifically, the emission standards contained in NAC 445B.2203 for particulate matter, 445B.22047 for sulfur emissions, 445B.22017 for opacity, and 445B.22097 for the ambient air quality standards must not be exceeded.

Nevada Applicable State Implementation Plan (ASIP)

The Applicable State Implementation Plan (ASIP) is a document prepared by a State or Local air regulatory agency and required to submit to the U.S. EPA for approval. The Title I of the Clean Air Act is the statutory authority for the U.S. EPA regulations that require a State to submit a SIP. The contents of the SIP are intended to show how a State, through the implementation and enforcement of the regulations contained in the SIP, will either show how attainment of the national ambient air quality standards (NAAQS) will be achieved or how a State will continue to maintain compliance with the NAAQS. Nevada's most recent ASIP approved by the U.S. EPA is based on State regulations codified in 1982 with revisions/approvals as recently as April 9, 2008. In general, the regulations contained in the ASIP closely parallel the current NAC regulations. However, because the ASIP is partly based on older air quality regulations (at this time), compliance with all of the current NAC regulatory requirements does not necessarily ensure compliance with the ASIP requirements. All of the equipment considered in this application must meet, at a minimum, the standards set forth in the ASIP. Specifically, the emission standards contained in ASIP NAC 445B.22017 for maximum opacity and 445B.22097 for the ambient air quality standards must not be exceeded.

New Source Performance Standards (NSPS)

The U.S.EPA has promulgated maximum emission standards and monitoring / recordkeeping methods for selected source categories. These standards are contained in Title 40 of the CFR, Part 60, and are known as the New Source Performance Standards (NSPS). No sources affected by this minor modification are subject to the provisions set forth under the New Source Performance Standards.

40 C.F.R. Parts 61 and 63 National Emission Standards for Hazardous Air Pollutants (NESHAP)

Parts 61 and 63 establish the National Emission Standards for Hazardous Air Pollutants (NESHAPS). There are no sources at the facility for which a standard has been established under these parts.

40 C.F.R. Parts 72 to 78 Acid Rain Exemption

The Cyanco facility is exempt from the acid rain provisions under 40 C.F.R. Parts 72 to 78 because there are no units listed in Tables 1, 2, or 3 of §73.10 at the facility, and there are no utility units at the facility that serve a generator that produces electricity for sale.

40 CFR Part 52.21. Prevention of Significant Deterioration Regulations (PSD)

The U.S. EPA delegated implementation of the federal PSD regulations to the State of Nevada; and BAPC implements the federal PSD regulations through a delegation agreement with EPA. These regulations contained at 40 CFR Part 52.21 specify federally required permitting procedures for each "major stationary source". The PSD regulations define a "stationary source" as "any building, structure, facility, or installation which emits or may emit any air pollutant subject to regulation under the Act." A "building structure facility or installation" is defined as "all of the pollutant emitting activities which belong to the same industrial grouping, are located on one or more contiguous or adjacent properties, and are under the control of the same person (or persons under common control) except the activities of any vessel. Pollutant-emitting activities shall be considered as part of the same industrial grouping if they belong to the same "Major Group" (i.e., which have the same first two digit code) as described in the Standard Industrial Classification Manual, 1972, as amended by the 1977 Supplement."

"Major" is defined as the potential to emit of a stationary source, which equals or exceeds a specified threshold (in tons per year) of any air pollutant regulated under the Clean Air Act (40 CFR 52.21(b)(1)). The first threshold is for a stationary source that emits or has the potential to emit 100 tons per year or more and is defined as one of 28 specific categories of sources (see 40 CFR 52.21(b)(1)(i)(a)). The other applicability threshold is for any other stationary source that emits or has the potential to emit 250 tons per year (see 40 CFR 52.21(b)(1)(i)(b)). As mentioned above, the SIC code for this facility is 2819, Industrial Inorganic Chemicals. Chemical process plants are one of the 28 specific categories of sources.. Major stationary source status therefore is classified at the 100 tons per year emission threshold for any pollutant regulated under the Clean Air Act for the Cyanco facility.

Prevention of Significant Deterioration Determination

As discussed above, 40 CFR Part 52.21 specifies that Prevention of Significant Deterioration (PSD) review is required for any new major stationary source or any major modification. A major source is defined as any pollutant emitting activities, which belong to the same two digit Source Industry Classification (SIC), and:

1. Emit 100 tons/yr or more of a regulated air contaminant as one of the listed categories of sources listed in 40 CFR 52.21; or
2. Emits 250 tons/yr or more of a regulated air contaminant and belong to any other category sources.

Cyanco is considered a major stationary source, and the requirements of the PSD regulations apply to this facility. This facility is a Chemical Processing Plant (a source type belonging to a list of 28 source categories) and the potential to emit of NO_x emissions (a NSR regulated pollutant) from the facility exceeds 100 tons per year. Therefore, this facility is subject to requirements of Class I and PSD permitting. Cyanco has submitted emission calculations as part of the minor revision application, which indicates that the potential annual emissions from this minor revision will not equal or exceed specified significant thresholds (in tons per year) of any air pollutant regulated under the Clean Air Act (40 CFR 52.21(b)(1)). Specific emissions increases are listed in Table 1.

The NDEP-BAPC reviews each proposed modification and evaluates whether each modification should be aggregated. This is the first revision application for a modification at the Cyanco facility since February 2004. The 2004 revision application was to increase the potential emissions of HCN and did not increase any emissions of any criteria pollutants. Due to the amount of time between that application and this application, and the fact that no criteria pollutant emissions were proposed to be increased, there are no aggregation issues.

Cyanco is proposing to use the actual to projected actual test allowed under 40 CFR 52.21(a)(2)(iv)(c). The method of determining actual emissions and the future actual emissions are detailed in Cyanco's application. The NDEP-BAPC has reviewed both the actual emissions determinations and the future actual calculations and concurs with Cyanco's assessment. Cyanco is also including a demand growth calculation in their calculations. NDEP-BAPC has reviewed the demand growth calculation and has concurred with Cyanco's reasoning. It is noteworthy that this revision would be minor without the inclusion of the demand growth calculation. However, Cyanco is in the process of preparing a subsequent Operating Permit to Construct (OPTC) application for the addition of a subsequent third NaCN processing line at their existing facility. Based on discussions with Cyanco, the OPTC application, taking into account the emissions increases in this application, will qualify as a minor PSD application.

Table 1: Actual to Projected Actual PSD Analysis

Pollutants	<u>PLANT #1</u> Annualized Emission (tpy)	<u>PLANT #2</u> Annualized Emission (tpy)	<u>FACILITY- WIDE</u> Annualized Emissions (tpy)	<u>FACILITY-WIDE</u> PSD Significant Level (tpy)
NO_x	2.8	13.9	16.7	<i>40</i>
CO	6.69	3.17	9.86	<i>100</i>
PM/PM₁₀/PM_{2.5}	3.17	2.29	5.46	<i>25/15/10</i>
VOC	0.82	3.23	4.06	<i>40</i>

Cyanco is also proposing to increase NaCN production in this application. Short term limits associated with this production increase have been increased by 114% for Unit 1 and 126% for unit 2 to allow for short-term operational flexibility. These percentages are consistent with the production increases for each unit. Although the short-term limits have been increased, no long-term limit in the permit has been increased. Cyanco will be constrained by their projected actual increases for annual emissions.

Since there is a production increase associated with this minor revision, the projected actual emissions, as defined in 40 CFR 52.21(b)(41), are the maximum annual rate at which an existing emissions unit is projected to emit a regulated NSR pollutant in any one of the 10 years following the date the unit resumes regular operation after the project. Adequate monitoring and reporting conditions have been added to the permit to ensure that a significant increase doesn't occur.

Compliance Assurance Monitoring (CAM)

The U.S. EPA has promulgated requirements for sources to provide detailed monitoring plans that will ensure compliance with all applicable requirements. These monitoring requirements are contained in 40 CFR Part 64. Section 64.2 specifies that these monitoring requirements apply to a "pollutant specific emission unit at a major source" if all of the following are satisfied:

- The unit is subject to an emission limitation or standard;
- The unit uses a control device to achieve compliance with any such emission limitation or standard; and
- The unit has potential pre-control device (uncontrolled) emissions equal to or greater than 100 percent of the amount, in tons per year, required for a source to be classified as a major source.

The potential to emit of uncontrolled annual emissions of NO_x from each NaCN Production Plant (TO-1, TO-2) at the Cyanco facility exceed the major source threshold (i.e., > 100 tpy) and

Cyanco also employs controls (Low NOx Burner) to minimize NOx emissions. Therefore, TO-1 and TO-2 are applicable to provisions of CAM for NOx. However, Cyanco utilizes NOx Continuous Emission Monitors (CEMS) at TO-1 and TO-2 each, and pursuant to 40 CFR 64(3)(d)(2), the use of CEMS satisfies CAM monitoring requirements for NOx.

The potential to emit of uncontrolled annual emissions of VOC from each NaCN Production Plant (TO-1, TO-2) at the Cyanco facility exceed the major source threshold (i.e., > 100 tpy) and Cyanco also employs controls (Thermal Oxidizer) to minimize VOC emissions. Therefore, TO-1 and TO-2 are applicable to provisions of CAM for VOC. Cyanco has previously submitted a VOC CAM Plan as a supplement to their Class I renewal application that defines excursions and indicator ranges for each Thermal Oxidizer. These provisions are already established in the operating permit.

The potential to emit of uncontrolled annual emissions of Cyanide Compounds (HAPs) from each NaCN Production Plant (TO-1, TO-2) at the Cyanco facility exceed the major source threshold (i.e., > 10 tpy for single HAP) and Cyanco also employs controls (Thermal Oxidizer) to minimize Cyanide Compounds emissions. Therefore, TO-1 and TO-2 are applicable to provisions of CAM for Cyanide Compounds. Cyanco has previously submitted a Cyanide Compounds CAM Plan as a supplement to their Class I renewal application that defines excursions and indicator ranges for each Thermal Oxidizer. These provisions are already established in the operating permit.

3.0 EMISSIONS INVENTORY

3.1 Annual Regulated Emissions

Table 2 shows the current permitted emission inventory.

Table 2 – Facility-Wide Potential to Emit

Pollutant	Potential to Emit	Potential to Emit
	(pounds/hour)	(tons/year)
Total Particulate Matter (PM)	5.34	23.16
Particulates as PM ₁₀	5.34	21.72
Sulfur Dioxide	0.47	0.46
Carbon Monoxide	25.19	81.27
Oxides of Nitrogen	53.92	194.66
Volatile Organic Compounds	22.06	94.68
Lead	5.20E-05	2.28E-04
Hazardous Air Pollutants	1.57	6.86

4.0 AMBIENT AIR QUALITY IMPACT

The purpose of the air quality analysis is to demonstrate that the emissions from the stationary source will not cause or contribute to a violation of any applicable federal or state ambient air quality standards. Cyanco has submitted an ambient air dispersion analysis as part of the renewal application. The BAPC has reviewed this dispersion modeling analysis and has determined that emissions from this facility will not violate any ambient air quality standard.

4.1 RESULTS

Pollutant	Averaging Period	Year	UTM Coordinate		Maximum (HIH) Modeled Concentration ($\mu\text{g}/\text{m}^3$)	NAAQS/ NvAAQS/ RfC standards ($\mu\text{g}/\text{m}^3$)	HIH <Standard
			East (m)	North (m)			
CO	1-hour	1983	428,290	4,532,650	32.75	40,000	Yes
		1984	428,290	4,532,575	33.27		Yes
		1985	428,290	4,532,600	32.75		Yes
		1986	428,290	4,532,475	31.22		Yes
		1987	425,565	4,532,500	35.26		Yes
	8-hour	1983	428,290	4,532,950	6.88	10,000	Yes
		1984	428,290	4,532,675	8.38		Yes
		1985	428,290	4,532,575	6.70		Yes
		1986	428,290	4,532,600	5.23		Yes
		1987	426,665	4,532,831	5.95		Yes
		1987	428,290	4,532,600	1.44		Yes
	NO ₂	Annual	1983	428,290	4,532,525	1.36	100
1984			428,290	4,532,525	1.47	Yes	
1985			428,290	4,532,450	1.32	Yes	
1986			428,290	4,532,575	1.36	Yes	
1987			426,665	4,532,306	0.18	Yes	
HCN	24-hour	1983	426,665	4,532,231	0.20	3	Yes
		1984	428,290	4,532,625	0.15		Yes
		1985	426,665	4,532,256	0.19		Yes
		1986	426,665	4,532,206	0.15		Yes
		1987	428,290	4,532,650	0.15		Yes

Pollutant	Averaging Period	Year	UTM Coordinate		Maximum (HIH) Modeled Concentration ($\mu\text{g}/\text{m}^3$)	Background Concentration ($\mu\text{g}/\text{m}^3$)	Total Concentration ($\mu\text{g}/\text{m}^3$)	NAAQS ($\mu\text{g}/\text{m}^3$)	Total Concentration < NAAQS
			East (m)	North (m)					
PM ₁₀	24-hour	1983	426,665	4,532,306	0.65	10.9	11.55	150	Yes
		1984	426,665	4,532,231	0.76		11.66		Yes
		1985	428,290	4,532,375	0.66		11.56		Yes
		1986	426,665	4,532,256	0.70		11.60		Yes
		1987	428,290	4,532,600	0.65		11.55		Yes
	Annual	1983	428,290	4,532,575	0.12	9.0	9.12	50	Yes
		1984	428,290	4,532,525	0.11		9.11		Yes
		1985	428,290	4,532,525	0.12		9.12		Yes
		1986	428,290	4,532,475	0.11		9.11		Yes
		1987	428,290	4,532,575	0.11		9.11		Yes

Attachment 1

Minor Revision Application