



west virginia department of environmental protection

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ENGINEERING EVALUATION / FACT SHEET

BACKGROUND INFORMATION

Application No.:	R13-1645A
Plant ID No.:	029-00033
Applicant:	C&C Marine Maintenance Company
Facility Name:	Congo Plant
Location:	Newell
NAISC Code:	483211, 488310, 488330, 488390, 488320, and 336611
Application Type:	Modification
Received Date:	July 12, 2011
Engineer Assigned:	Edward Andrews
Fee Amount:	\$1000.00
Date Received:	July 12, 2011
Completeness Date:	July 26, 2011
Due Date:	October 27, 2011
Newspaper:	<i>The Weirton Daily Times</i>
Applicant Ad Date:	July 14, 2011
UTMs:	Easting: 530.9 km Northing: 4,495.3 km Zone: 17
Description:	This modification is required as part of the compliance plan in Consent Order CO-R13-E-2011-4 and the installation of vapor recovery system with a flare.

DESCRIPTION OF MODIFICATION

The Congo Plant is owned and operated by C&C Marine Maintenance Company (C&C Marine), formally owned & operated by DTC, which is located near Newell, WV. This facility provides harbor and fleeting services, vessel repair and tankerman services, tank barge cleaning and steaming services to the marine transportation sector. R13-1645 was originally issued to address odors generated during the cleaning and steaming of tanker barges.

C&C Marine proposes to use a mobile flare unit that will enhance the facility's existing odor control program. The remaining liquid in the tanker barge will first be pumped out. Once

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the remaining liquid is removed, the vapor collection system (VCS) will be connected to the compartment of the barge to be ventilated. This VCS will only handle one compartment at a time. The VCS will route these vapors to the flare to be destroyed. The flaring continues until the concentration of the combustible vapors fall to a level that does not support flaring. C&C Marine believes that the flare will cease once the concentration of the vapors fall below the lower explosion limit for that particular material. This process is repeated until all of the compartments of the barge have been ventilated. The use of this VCS and flare is limited to certain products, which is noted in Table 2 in this evaluation. To allow cleaning operations to commence, the barge may be required to be ventilated using other mechanical means to allow for human occupation of the compartment.

In addition, C & C Marine is proposing to clean barges containing additional materials that are not currently listed in R13-1645. A list of these new materials are identified in Table #2.

C&C Marine is requesting several revisions and edits to Permit R13-1645 as a result of Consent Order CO-R13-E-2011-4 issued March 17, 2011 to the previous owner, DTC Environmental Services, Inc. C&C Marine acquired the Congo Plant from DTC on April 15, 2011, and subsequently accepted the responsibilities for Permit R13-1645 and Consent Order CO-R13-E-2011-4.

C&C Marine is complying with Order #2 of Consent Order CO-R13-E-2011-4 by submitting this modification application within 120 day of the effective date of the consent order.

SITE INSPECTION

The Congo Plant is an existing non-major (deferred) Title V source. Therefore, the Compliance and Enforcement Section routinely inspects the facility. Mr. Steven Sobotka, P.E., an engineer assigned to the Northern Panhandle Regional Office, last inspected the facility on August 8, 2008.

The writer and Mr. Steve Sobotka, P.E., an engineer assigned to the Northern Panhandle Regional Office's Compliance and Enforcement Section, conducted a site visit of the facility on August 18, 2011. Mr. Ronald Corigliano, Director of Regulatory Compliance, Mr. Edmund Mile, Environmental Compliance Officer, Mr. Rick Wilson, Acadia Environmental Group, and other key managers and operators of the Congo Plant were present during this visit.

The facility is located adjacent to Ergon's Newell Plant and one resident. The Ohio River and an in-land lagoon define the rest of the facility.

ESTIMATE OF EMISSIONS BY REVIEWING ENGINEER

The applicant used pollutant specific emissions factors from Chapters 1.4 and 13.5 of AP-42 to estimate emissions from the flare. The flare manufacturer rated the proposed unit at a maximum heat input of 53 MMBtu/hr, which was used in the following estimates.

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Table # 1 – Emissions from the Mobile Flare				
Pollutant	Emission Factor	Hourly Rate lb/hr	Annual PTE (TPY)	Proposed Annual Rate (TPY)
Particulate Matter (PM)/PM ₁₀ /PM _{2.5} Filterable	7.6 lb/mmcf	0.40	1.76	0.19
Sulfur Dioxide (SO ₂)	0.6 lb/mmcf	0.03	0.14	0.01
Oxides of Nitrogen (NO _x)	0.068 lb/MMBtu	3.6	15.8	1.70
Carbon Monoxide (CO)	0.37 lb/MMBtu	19.6	85.9	9.18
Volatile Organic Compounds (VOCs)	0.20 lb/MMBtu	10.76	47.13	5.04

The proposed annual limits are based on an annual flaring schedule of 936 hours per year or 11% of the year. The proposed annual limits may appear to be restrictive. Most tanker barges have a size capacity of between 10,000 BBL to 30,000 BBL, which equates to a volume of 56,000 to 168,400 cubic feet. Only considering the largest sized tanker, VCS would take 3.3 hours to exchange the vapor space in one tanker. Based on this ventilation rate, the VCS and flare would only vent 283 barges per year.

C&C Marine believes that the flare will flame out once the concentration of vapors in the tanker fall below the lower explosive limit (LEL). Some of the proposed material has significant heating value at low concentrations that it might be possible that flaring may continue even once the concentration fell below the material's LEL.

Under Permit R13-1645, the VOC and hazardous air pollutant (HAPs) emissions were estimated in terms of lb of pollutant per barge cleaned. The condensation system with carbon adsorption control reduced the VOC down to 10.42 lb/barge of raffinate. Cleaning raffinate barges yielded the highest VOC rate of the materials evaluated for Permit R13-1645. The writer believes that the overall control efficiency for the condensation system used to estimate these emissions in R13-1645 was 98%.

The writer understands that the condensation system never operated correctly as proposed. Thus, this evaluation will not discuss or compare the condensation system to the proposed VCS with flare.

The draft permit will not include a specific limit sulfur dioxide emission from the flare since, the potential to emit sulfur dioxide emissions at a continuous operating schedule would be less than 300 pounds per year.

REGULATORY APPLICABILITY

WV STATE RULES

45CSR4 To Prevent and Control the Discharge of Air Pollutants into the Open Air Which Causes or Contributes to an Objectionable Odor or Odors

This rule prohibits sources from discharging air pollutants that may cause or contribute to objectionable odors. In effort to comply this rule, C&C Marine proposes to use a vapor recovery system with an air-assisted flare when cleaning tanker barges that had been used to transport certain materials. These products are identified in the following table.

Table #2 – List of Liquid Materials Cleaned in Barges				
Materials Cleaned	Odor Control Program	Flared	Neither	Approved in R13-1645
2-Ethyl Hexanol	X	X		X
Acetone	X	X		X
Aromatics (100, 150 and 200)	X	X		
Benzene	X	X		
Buytl Acrylate	X			
Caustic Soda			X	X
Chlorine Liquid			X	
Coal Tar Distillates	X			
Coal Tar Light Oil	X	X		X
Cresols	X			
Crude Coal Tar	X			X
Crude Oil	X	X		
Cumene	X	X		X
Diesel	X			X

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Ethyl Alcohol	X			
Gasoline	X	X		X
Glycols	X			X
Heavy Oils	X			
Inorganic Acids			X	
Isodecyl Alcohol	X			X
Isononyl Alcohol	X			X
Isopropyl Alcohol	X			X
Kerosene	X			X
Ketones	X	X		
Lube Oils, Base Stocks, Slack Wax	X			X
Methanol	X	X		
Methyl Ethyl Ketone	X	X		X
Mineral Spirits	X			X
Naphtha	X			
Naphthalene	X			X
Oil Distillates	X			
Petroleum Distillates	X			
Pentane	X			
Raffinate	X	X		X
Refined Chemical Oil	X			X
Resin Oil	X	X		X
Styrene	X	X		X

Toluene	X	X		X
Xylene	X	X		X

As listed in the table, C&C Marine proposes to use the VCS and flare when initially ventilating the compartments that contain these 14 materials. This odor control technique will reduce the potential of objectionable odors from most of these materials by destroying these with the use of a flare before being discharged to the atmosphere.

45CSR6 – To Prevent and Control Air Pollution From Combustion of Refuse

This rule requires the DAQ to regulate all forms of incinerators regardless of size or capacity. The proposed air-assisted flare is classified as an incinerator and subject to the emission limitations of this rule. Using the equation of 45CSR§6-4.1., this air-assisted flare would have an allowable emission rate of 12.43 pounds of PM per hour and a visible emission limit of less than 20% opacity. C&C Marine plans only to vents vapors, which might contain liquid droplets of cargo, which has little potential to generate PM when operated properly.

The applicant estimated the PM emission rate at maximum heat input to be 0.40 pounds per hour. Most flares today are designed to be smokeless. When smoking does occur, there is lack of oxygen, which allows the small particles of carbon to cool below their ignition temperature. C&C Marine proposed flare is an air-assisted one that should not smoke when properly operated. Thus, the proposed flare should be capable of meeting the emission limitation of this rule.

45CSR13 - Permits for Construction, Modification, Relocation and Operation of Stationary sources of Air Pollutants, Notification Requirements, Administrative Updates, Temporary Permits, General Permits, and Procedures for Evaluation

The potential to emit from the proposed emission units would exceed 6 pounds per hour and 10 tons per year for any pollutant of carbon monoxide. Therefore, C&C Marine must obtain a modification permit as required by 45CSR-13.5.1.

To meet the applicable permit requirements of this rule, C&C Marine published a Class I Legal Advertisement in *The Weirton Daily Times* on July 14, 2011, paid the \$1000.00 application fee, and submitted a complete permit application.

45CSR30 Requirements for Operating Permits

This rule provides for the establishment of a comprehensive air quality permitting system consistent with the requirements of Title V of the Clean Air Act, and provides for a transition period prior to the implementation of the permitting system. Since Boiler #2 is subject to Subpart Dc of Part 60 and the facility is a minor source (i.e. Facility PTE <100 TPY), the Congo Plant is a deferred source under 45 CSR30. The boilers operated at the Congo Plant are covered

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under Permit R13-2558B. Thus, the source is required to continue to submit annually a Certified Emission Statements (CES) and pay the operating fees accordingly.

TOXICITY OF NON-CRITERIA REGULATED POLLUTANTS

This facility cleans tanker barges that transport several different cargos. Several of these materials, which are listed in Table #1, are classified as hazardous air pollutants (HAPs) if released to the atmosphere. In the past, the facility was permitted to clean barges that contained some of these hazardous air pollutants. The toxicity of these materials varies from known human carcinogens (benzene) to non-carcinogenic effects (hydrochloric acid).

Most of these HAPs were evaluated during the previous permit review process. During this review, the DAQ determined that the cumene impacts from venting of more than six cumene barges in a year were not acceptable. Thus, Permit R13-1645 limited the ventilating and cleaning of Cumene barges to six per year. C & C Marine did not request to change this limit in this permitting action.

Besides cumene, Permit R13-1645 did not place any other restriction to reduce annual emissions. The permittee requested annual operating restrictions on the flare that reduces the potential to emit HAPs beyond what was imposed in Permit R13-1645. Considering the destruction efficiency of the flare and past permit application review, no additional toxicity evaluation is necessary for this proposed permitting action.

AIR QUALITY IMPACTS ANALYSIS

The writer deemed that an air dispersion modeling study or analysis was not necessary, because the proposed modification does not change the Congo Plant classification as a minor source.

MONITORING OF OPERATIONS

The applicant proposed limiting the operation of the flare to 936 hours per year. This particular flare will be equipped with a flow meter with totalizer from the manufacturer. Monitoring the actual flow rate of vapor is a function of actual emissions. Second, EPA has linked flare performance to velocity at the flare tip, which can be determined from the flow rate of the effluent. Thus, the applicant will be required to monitor flow rate of effluent to the flare on a continuous basis.

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Permit R13-1645 required the following records be maintained for each barge docked at the facility:

- Records of Contents
- Date and time that the barge arrived and departed
- Description of any work performed by the facility on the barge
- Date and time of the work performed
- A list of all air quality related complaints received by the facility

For each barge to be cleaned that had been transporting approved materials, the following records be kept:

- Calibration of the organic analyzer
- Concentration reading from the analyzer at the specified locations (before and after the adsorption system).

In the current application, C & C Marine requested that the records be limited to the following for barges docked at the facility:

- Barge Number;
- Records of Barge Contents;
- Date and time cleaning began and finished; and
- A list of all air quality related complaints received by the facility.

The writer agrees that records of all work performed on the barges at the facility are not necessary in terms of demonstrating compliance with this permit or other applicable requirements within the jurisdiction of the DAQ. Further, the agency needs to be concerned mainly with the cleaning activities from this facility and operation of the equipment used to perform such work. Thus, the draft permit will focus on the suggested recordkeeping and effluent flow rate to the flare.

Under Rule 6, the flare will be subject to a 20 % opacity standard. Compliance will be demonstrated by performing quarterly visible observation checks, which will be outlined in the permit.

CHANGES TO PERMIT R13-1645

Permit R13-1645 required the applicant to use a condensation/adsorption system to control vapors from tanker barges, which will be replaced by the VCS and flare. This permit was written in a previous format. All of the conditions in Section A would be replaced except for the restriction on cleaning Cumene barges in A.4. Conditions B.1. – B.3., B.5., & B.6. shall be omitted. B.4. will be updated as noted in the monitoring section of this evaluation as Condition 4.2.1.

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RECOMMENDATION TO DIRECTOR

Therefore, the writer recommends that the Director grant a modification permit to C&C Marine Maintenance Company for the construction of a vapor collection system with a flare at their Congo Plant.

Edward S. Andrews, P.E.
Engineer

Date: November 3, 2011

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