west virginia department of environmental protection

Division of Air Quality
601 57th Street SE
Charleston, WV 25304
Phone (304) 926-0475 • FAX: (304) 926-0479

Earl Ray Tomblin, Governor
Randy C. Huffman, Cabinet Secretary
www.dep.wv.gov

ENGINEERING EVALUATION / FACT SHEET

BACKGROUND INFORMATION

Application No.:	R13-2608B
Plant ID No.:	051-00005
Applicant:	Ohio Power Company
Facility Name:	Mitchell Plant
Location:	Moundsville, Marshall County
NAICS Code:	221112
Application Type:	Modification
Received Date:	September 16, 2011
Engineer Assigned:	Steven R. Pursley, PE
Fee Amount:	$1,000.00
Date Received:	September 21, 2011
Complete Date:	October 13, 2011
Due Date:	January 11, 2012
Applicant Ad Date:	September 14, 2011
Newspaper:	*Moundsville Daily Echo*
UTM's:	Easting: 516.00 km Northing: 4,409.00 km Zone: 17
Description:	Modification to convert the existing vacuum conveying system to a complete dry ash handling system.

DESCRIPTION OF PROCESS

The Mitchell Dry Fly Ash Conversion Project will convert the existing vacuum conveying system to a complete dry ash handling system designed to convey dry, free flowing Fly Ash and Economizer Ash from Units 1 and 2 to three new concrete Fly Ash Silos for storage and transport.

The project is composed of three major systems: Unit 1 Fly Ash Removal System, Unit 2 Fly Ash Removal System and the Fly Ash Silo System. In conjunction with this project, a new dry ash landfill and associated haul road are being constructed for disposal of the fly ash.

Unit 1 Fly Ash Removal System

The Unit 1 Fly Ash Removal System includes the ash handling Vacuum Conveying System from the existing precipitator boxes and Economizer hoppers to the new Vacuum/Pressure Transfer Stations and the ash handling Pressure Conveying System to the new Fly Ash Silos.

There are two Vacuum Conveying Systems, on per precipitator box, provided to convey the ash from the Fly Ash hoppers and the Economizer Ash hoppers and are operated independently of the other System. Each system is designed to covey to one of two new, dedicated Vacuum/Pressure Transfer Stations. An automatic Transfer Station crossover exists for each conveying system when one transfer station is shut down for maintenance. There are a total of four transfer stations for Unit 1. A transfer stations consists of one filter/separator assembly and two feeder assemblies.

The vacuum source for the Vacuum Conveying System is supplied by one of three motor driven mechanical exhausters. The three mechanical exhausters are connected such that one is dedicated to each system and one is a spare that can be used by either system. The mixture of ash and air is conveyed in conveyor lines in a dry state to the filter/separator of the selected transfer station where ash is removed from the air stream and dumped into the feeder assemblies for pressure conveying to the fly ash silo system for storage and transport. The filter/separator is intended to control particulate emissions from the conveying air. When conveying air leaves the separating equipment, it passes through the mechanical exhauster and discharges to the atmosphere.

There are two pressure conveying systems, one for each unit serving a pair of transfer stations, provided to convey the ash from the transfer station feeder assemblies to the new Fly Ash Silo. The two systems are operated independently of each other. A common spare pressure conveying line (with automatic crossover) is provided for both conveying systems. Therefore, there are three pressure conveying lines routed to the new Fly Ash Silos.

Conveying air for each Pressure System is supplied by one of three motor driven Fly Ash Conveying Compressors. The three compressors are connected such that one is dedicated to each system and one is a spare that can be used by either system.

Two feeder assemblies are located under each filter/separator. Each feeder assembly receives material from the filter/separator at low pressure and introduces it into the pressurized conveyor line. The row of feeder assemblies empties, in a timed sequence, into the main conveying line. Here, the material is mixed with the conveying air and is transported to the Fly Ash Silos.

The material is collected and stored in the Silos, while the conveying air is vented to atmosphere through a bin vent filter. Each storage silo will be equipped with a bin vent filter. The bin vent filter in intended to control particulate emissions from the displaced air that is discharged from the silos. The air discharging through the bin vent filter is a result

of the conveying air, dry unloader vent fan air, the air displacement caused by filling the silo with fly ash, the air displacement caused by expansion due to temperature difference, and also from fly ash fluidizing air that is blown into the bottom of the storage silo.

Unit 2 Fly Ash Removal System

The Unit 2 Fly Ash Removal System is similar to the Unit 1 Fly Ash Removal System.

Fly Ash Silo System

The Fly Ash Removal System includes three new concrete fly ash silos, each equipped with its own dedicated silo fluidizing system, silo dry ash unloading system and silo conditioned ash unloading system.

The material collected and stored in the Fly Ash Silos can be unloaded into trucks for removal to a disposal point in either a dry or conditioned state. Ash is unloaded from a silo in a dry state into a closed-top tank truck with a telescopic spout. Each spout is equipped with a vent module. If it is not desired to unload the ash in a dry state, ash is unloaded from a silo in a conditioned state into an open top truck with a pin paddle mixer/unloader. The trucks, containing conditioned fly ash, are used to transport the ash to the new Mitchell plant dry fly ash landfill that is being constructed in conjunction with the dry fly ash project.

SITE INSPECTION

No site inspection was performed by the writer. The facility is an existing well known source to DAQ. Al Carducci of DAQs Northern Panhandle Regional Office performed a full, on site inspection on September 22, 2011. The facility was found to be in compliance.

ESTIMATE OF EMISSIONS BY REVIEWING ENGINEER

Controlled emissions due to the modification are as follows. Note that all emissions (except emissions from baghouses) are calculated (uncontrolled) based on AP-42 then have the following control efficiencies applied to them. Baghouse emissions are based on a vendor guarantee of either 0.01 gr/dscf or 0.005 gr/dscf (plus a 20% safety factor).

Telescopic Chute	75%
Paved Haulroad (Water sprays & sweeping)	94%
Unpaved Haulroad (Water sprays & chemical treatment)	94%

Additionally, haulroad calculations are based on site specific tested silt loadings.

Source	PM		PM_{10}		$PM_{2.5}$	
	lb/hr	tpy	lb/hr	tpy	lb/hr	tpy
ME-1A	0.16	0.69	0.16	0.69	0.16	0.69
ME-1B	0.16	0.69	0.16	0.69	0.16	0.69
ME-1C	0.16	0.69	0.16	0.69	0.16	0.69
ME-2A	0.15	0.65	0.15	0.65	0.15	0.65
ME-2B	0.15	0.65	0.15	0.65	0.15	0.65
ME-2C	0.15	0.65	0.15	0.65	0.15	0.65
BVF-A	0.75	3.25	0.75	3.25	0.75	3.25
BVF-B	0.75	3.25	0.75	3.25	0.75	3.25
BVF-C	0.75	3.25	0.75	3.25	0.75	3.25
WFA-AA	0.07	0.09	0.03	0.04	0.01	0.01
WFA-AB	0.07	0.09	0.03	0.04	0.01	0.01
WFA-BA	0.07	0.09	0.03	0.04	0.01	0.01
WFA-BB	0.07	0.09	0.03	0.04	0.01	0.01
WFA-CA	0.07	0.09	0.03	0.04	0.01	0.01
WFA-CB	0.07	0.09	0.03	0.04	0.01	0.01
TC-A (pt. source)	0.05	0.20	0.05	0.20	0.05	0.20
TC-B (pt. source)	0.05	0.20	0.05	0.20	0.05	0.20
TC-C (pt. source)	0.05	0.20	0.05	0.20	0.05	0.20
TC-A (fugitive)	0.87	1.16	0.41	0.55	0.07	0.09
TC-B (fugitive)	0.87	1.16	0.41	0.55	0.07	0.09
TC-C (fugitive)	0.87	1.16	0.41	0.55	0.07	0.09
Paved Haulroad	7.15	4.87	1.43	0.98	0.36	0.24
Unpaved Haulroad	13.99	9.52	4.00	2.72	0.40	0.28
landfill wind erosion	0.01	1.45	0.01	0.72	0.01	0.11
landfill roadway	2.70	2.80	0.84	0.87	0.08	0.09
landfill truck dumping	0.16	0.09	0.08	0.04	0.02	0.01
Total*	**25.45**	**24.75**	**7.76**	**11.30**	**2.25**	**6.67**

*The total is based on a worst case scenario by assuming that all ash will be conditioned and placed in dump trucks for transport to the landfill. While transfer of dry fly ash may result in higher emission factors, the on-site trucking is then eliminated since this ash is being sold and transferred off-site. Also because each silo is conceivably able to handle the entire ash production for one year, the annual emissions from each individual silo are calculated on that basis but the total emissions for the project are then based on only one silo being in operation. Similar assumptions were made for the fly ash filters/separators (any 4 of the 6 being operated simultaneously). Therefore the "Total" emissions do not equal the sum of each individual emission point. The "Total" is the sum of the worst case scenario represented in the above table in red.

REGULATORY APPLICABILITY

The modification proposed to be permitted under this application R13-2608B is subject to the following state and federal regulations:

45CSR2 To Prevent and Control Particulate Air Pollution From Combustion of Fuel in Indirect Heat Exchanger.

The facility is subject to the requirements of §45-2-5 "Control of Fugitive Particulate Matter." The only requirement under this section is the proscription of any source of fugitive particulate matter "that is not equipped with a fugitive particulate matter control system." Ohio Power Company proposes to meet this requirement through the installation and utilization of enclosures, wet suppression, dry dust collectors and chemical suppression.

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

The facility is subject to the requirements of 45CSR13 because Uncontrolled PM emissions from the modification exceed 6 pounds per hour and 10 tons per year.

45CSR30 Requirements for Operating Permits

The facility is subject to the requirements of 45CSR30 because the existing power plant is a major source as defined in 45CSR30.

TOXICITY OF NON-CRITERIA REGULATED POLLUTANTS

The application states that only particulate emissions will be emitted.

AIR QUALITY IMPACT ANALYSIS

Since this is a minor modification to an existing major stationary source, no modeling was performed.

MONITORING OF OPERATIONS

In addition to the monitoring already required by R13-2608A, the permittee will perform the following monitoring of operations:

* For the purposes of determining compliance with the proposed maximum throughput limit, the facility will maintain monthly (and calculated rolling yearly total) records of the amount of flyash handled by the Units 1 and 2 fly ash system.

* A regular fugitive fly ash emissions inspection program shall be implemented and properly documented. The permittee at a minimum, shall inspect all fly ash fugitive dust control systems weekly to ensure that they are operated as necessary and maintained in good working order. The inspection program shall include provisions to document any observed accumulations of fly ash on or around facility control equipment and proximate areas. The inspections shall be documented and maintained on-site for a minimum of five years.

* The permittee shall maintain records indicating the use of any dust suppressants or any other suitable dust control measures applied at the facility.

CHANGES TO PERMIT R13-2608A

The following changes were made to permit R13-2608A:

* The permit was put into the most recent boilerplate

* New conditions 4.1.20 - 4.1.24 were added

* Old condition 4.1.17 was modified to increase frequency of chemical treatment.

* New conditions 4.2.7 - 4.2.8 were added

* New condition 4.3.2 was added

* New condition 4.4.12 was added

RECOMMENDATION TO DIRECTOR

Information supplied in the application indicates that compliance with all applicable regulations will be achieved. Therefore it is the recommendation of the writer that permit R13-2608B for the modification of a power plant near Moundsville, Marshall County, be granted to Ohio Power Company.

Steven R. Pursley, PE
Engineer

January 11, 2012