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To: Ohio Environmental Protection Agency
Akron Regional Air Quality
1867 West Market Street
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From: Wilma Subra

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Re: Wadsworth Compressor Station Air Permit Application

Madina County, Ohio

The following comments are submitted in opposition to the granting of an air permit for the Wadsworth Compressor Station.

The Wadsworth Compressor Station will service the new NEXUS Gas Transmission natural gas pipeline to deliver natural gas from Appalachia supplies to markets in Ohio, Michigan, Chicago and Ontario.

The Wadsworth compressor is designed to maintain line pressure and ensure natural gas continues to move at sufficient volumes for reliable service at delivery points. The compressor station will consist of a 29,517 horse power natural gas fired Solar Turbine, Titan-250-30002S4.

The air emissions from the units associated with the compressor station will have a negative impact on the health of those living, working or spending time in the area of the compressor station.

Air Emissions

Compressor Turbine (P001)

As designed, the Wadsworth compressor station will result in the release of air emissions from the compressor turbine as well as a number of other units associated with the operations of the compressor station.

The compressor turbine (Natural gas-fired Solar Titan 250-30002S4) will have the highest quantity of air emissions for:

-Nitrogen Oxide (NOX)	30.99 tons per year
-Carbon Monoxide (CO)	7.79 tons per year
-Sulfur Dioxide (SO2)	3.21 tons per year
-Particulate Matter (PM, PM10 and PM 2.5)	6.23 tons per year
-Green House gases (CO2 equivalents)	111,925 tons per year

Gas Releases (P003)

The gas releases from periodic maintenances, routine operations and pigging activities will evacuate the turbine and piping components directly into the atmosphere. These gas releases will result in the highest air emissions of very toxic chemicals:

-Volatile Organic Compounds	19.8 tons per year
-Total Hazardous Air Pollutants	1.64 tons per year

Second highest concentrations of air emissions:

-CO2 Equivalent	15,401 tons per year
-Hexane	0.58 tons per year

Equipment Leaks (P801)

Equipment leaks from equipment components such as valves, flanges and connectors throughout the compressor station will release the third highest concentrations of:

-Volatile Organic Compounds	6.28 tons per year
-Green House gases (CO2 equivalent)	997 tons per year

Second highest concentrations of air emissions:

-Hexane	0.11 tons per year
-Total Hazardous Air Pollutants	0.76 tons per year

Separator Vessels 1-5 and Storage Tank 1 (P004 – P008, and T001)

The separator vessels consist of fixed roof tanks handling condensate liquids collected from the pipelines.

-VOCs	1.28 tons per year
-CO2 Equivalents	56 tons per

Separator Vessels:

#1 and #2 – 530 gallons each

#3 – 400 gallons

#4 – 317 gallons

#5 - 43 gallons

Storage Tank #1 is a fixed roof tanks with a 2,000 gallons capacity which will store condensate liquids collected from the pipeline and station equipment.

Emergency Generator (P002) - permit by rule

-VOCs	0.87 tons per year
-CO@ Equivalent	432 tons per year
-Total HAP	0.53 tons per year

Ozone

In addition to the air emissions listed above, the Nitrogen Oxide released by the combustion turbine (30.00 tons per year) and emergency generator (0.97 tons per year) will combine with the VOCs released by the combustion turbine, emergency generator, gas release, equipment leaks and the separator vessels and storage tank in the presence of heat and sunlight to produce ozone. The ozone will result in respiratory impacts to those living in the area of the compressor station.

Startup, Shutdowns and Pigging Events

There will be up to 260 startup events and 260 shutdown events per year in association with the compressor turbine. These start up or shut down events will occur 71% of the days in each year.

There will be 5 pigging events per year.

The air emissions from these events will result in degrade of the quality of the air and result in negative health impacts as a result of inhalation of the toxic chemicals released into the air.

NEXUS Gas Transmission Compressor Stations

Wadsworth Compressor Station
Guilford Road, Wadsworth (Medina County)

Combustion Turbine 29,517 Horse Power natural gas fired Solar Turbine, Titan-250-30002S4

Process Heater 1.125 MMBtu/hr

Emergency Generator 880 Horse Power natural gas fired

Waterville Compressor Station
Mossman Dr., Waterville (Lucas County)

Combustion Turbine 29,517 Horse Power natural gas fired Solar Turbine, Titan-250-30002S4

Process Heater 1.125 MMBtu/hr

Emergency Generator 880 Horse Power natural gas fired

Salineville Compressor Station
Yellow Creek road, Salineville (Columbiana County)

2 Combustion Turbines 10,802 Horse Power natural gas fired Solar Turbine, Taurus-070-10802S3

Emergency Generator 880 Horse Power natural gas fired

Hanoverton Compressor Station
State Route 644, Hanoverton (Columbiana County)

2 Combustion Turbine 29,517 Horse Power natural gas fired Solar Turbine, Titan-250-30002S4

Process Heater 1.125 MMBtu/hr

Emergency Generator 1,175 Horse Power natural gas fired

Clyde Compressor Station
Pickle Street, Clyde (Sandusky County)

Combustion Turbine 29,517 Horse Power natural gas fired Solar Turbine, Titan-250-30002S4

Process Heater 1.125 MMBtu/hr

Emergency Generator 880 Horse Power natural gas fired

The Hanoverton Compressor Station will have the largest compressor horsepower, 59,034 horse power, followed by the Salineville Compressor Station, 21,604 horse power. The other three compressor stations, Wadsworth, Waterville and Clyde will each have 29,517 horse power compressor capacity.

The Compressor Turbines, Process Heaters and Emergency Generators will release Nitrogen Oxide, Carbon Monoxide, Sulfur Dioxide, Particulate Matter, Volatile Organic Compounds, Hazardous Air Pollutants and Green House Gases into the air.

The Compressor Turbines will release the highest concentrations of Nitrogen Oxide, Carbon Monoxide, Sulfur Dioxide, Particulate Matter 10/2.5 and Green House Gases into the air. They will release the third highest concentration of Volatile Organic Compounds into the air.

Separator Vessels and Storage Tanks (gallons)

Vessel	Wadsworth	Waterville	Salineville	Hanoverton	Clyde
Separator #1	530	1,590	750	530	530
Separator #2	530	1,590	750	530	530
Separator #3	400	1,200	168	400	400
Separator #4	317	950	168	317	317
Separator #5	43	130	587	43	43
Separator #6			587		
Storage #1	2,000	2,000	2,000	2,000	2,000
Storage #2	570	570	570	570	570
Storage #3	3,000	3,000	3,000	3,000	3,000

Storage #1 Condensate liquid

Storage #2 Lube oil

Storage #3 Oily water

The separator vessels consist of vertical fixed roof tanks for handling condensate from the pipeline. The Waterville Compressor Station will have the largest condensate storage capacity, 5,460 gallons. The Salineville Compressor Station will have the second largest condensate storage capacity, 3,010 gallons. Compressor Stations Wadsworth, Hanoverton and Clyde will each have 1,820 gallon condensate storage capacity.

Storage tanks 1, 2 and 3 will be vertical fixed roof tanks used to store condensate liquids collected from the pipeline and station equipment, lubricating oils from the turbine(s) and oily water. The liquids in the storage tanks will be transferred to tanker trucks for shipment off site.

The Separator Vessels and Storage Tanks will release Volatile Organic Compounds, Hazardous Air Pollutants, Hexane and Green House Gases into the air.

Air Emissions Sources at the Compressor Stations in Addition to the Compressor Turbines, Process Heaters, Emergency Generators, Separator Vessels and Storage Tanks

Sources	Wadsworth	Waterville	Salineville	Hanoverton	Clyde
Parts Washer	*	*	*	*	*
Loading	*	*	*	*	*
Gas Releases	*	*	*	*	*
Pipeline Pigging	*	*	*		*
Equipment Leaks	*	*	*	*	*
Roadways	*	*	*	*	*

Loading Operation – transfer condensate liquids, used lubricating oil and oily water to tanker trucks for offsite shipmen

Gas Releases will be caused by periodic maintenance, routine operations, start up and shut down events and pigging activities and will result in evacuation of gases from turbine equipment and piping components directly to the atmosphere.

Start up and Shut down events – 260 Start Up and 260 Shut Down events each year. 71% of days each year will have a Start Up event and 71% of the days each year will have a Shut down event.

Pigging Events 5 per year

Equipment Leaks – valves, flanges, connectors, pump seals and open ended lines through out the compressor facility

Roadways – vehicle traffic on facility roadways, fugitive emissions of particulate matter

The Loading Operations, Gas Releases and Equipment Leaks will release Volatile Organic Compounds, Hazardous Air Pollutants, Hexane and Green House Gases into the air.

The Gas Releases will release the largest quantity of Volatile Organic Compounds, Hazardous Air Pollutants and Hexane into the air of all of the units and activities at the compressor facility.

The Equipment Leaks will release the second highest quantity of Volatile Organic Compounds into the air.

The Parts Washer will also release Volatile Organic Compounds into the air.

Overall Compressor Station Air Emissions (tons per year)

Pollutant	Wadsworth	Waterville	Salineville	Hanoverton	Clyde
CO	7.81	7.81	28.61	19.07	7.81
NOx	31.2	31.08	42.4	65.0	31.2
PM10	6.24	6.24	5.06	12.6	6.24
SO2	3.24	3.24	2.6	6.45	3.24
VOC	29.3	30.8	41.56	44.52	24.1

The air emissions from the Hanoverton Compressor Station will be the highest for Nitrogen Oxide (NOx) , Particulate Matter 10 (PM10), Sulfur Dioxide (SO2), and Volatile Organic Compounds (VOCs). The air emissions for Carbon Monoxide will be the highest at the Salinevlle Compressor Station.

The Hanoverton Compressor Station will have the largest compressor capacity (57,034horse power) and largest quantity of air emissions for Nitrogen Oxide, Particle Matter 10, Sulfur Dioxide and Volatile Organic Compounds. The Salineville Compressor Station will have the second highest horse power capacity (21,604horse power) and the highest air emissions for Carbon Monoxide.

Ambient Air Quality in Areas of Proposed Compressor Stations

The proposed location of the Wadsworth Compressor Station has air quality in marginal non-attainment for ozone.

The proposed locations of the Waterville and Clyde compressor stations have air quality in attainment for ozone.

The proposed location of the Salineville and Hanoverton compressor stations have air quality in attainment for all criteria pollutants.

Regulatory Agency Recommendations for Air Pollution Permit to Install and Operate (PTIO) for the Five Compressor Stations

The draft Air Pollution Permit to Install and Operate for the Wadsworth, Waterville, Salineville, Hanoverton and Clyde compressor stations were issued by the Ohio Environmental Protection Agency on January 12, 2016.

The agency divisions listed as having authority over and to receive comments concerning the draft air pollution PTIO are as follows:

Wadsworth Compressor Station

Ohio EPA, Division of Air Pollution Control

Akron Regional Air Quality Management District

Waterville Compressor Station

Ohio EPA, Division of Air Pollution Control

Toledo Department of Environmental Services

Salineville Compressor Station

Ohio EPA, Division of Air Pollution Control

Ohio EPA, DAPC Northease District Office

Hanoverton Compressor Station

Ohio EPA, Division of Air Pollution Control

Ohio EPA, DAPC Northeast District

Clyde Compressor Station

Ohio EPA, Division of Air Pollution Control

Ohio EPA, DAPC Northwest District Office

Toxic Chemicals Released by Compressor Stations and the Associated Health Impacts

The pathways of human exposure of air emissions from the compressor stations consist of inhalation, ingestion and dermal absorption. The air emissions from the various units associated with the compressor stations associated with the Nexus pipeline and the Wadsworth Compressor station in particular as well as the venting of gases from the periodic maintenances, routine operations, equipment leaks, startup and shut down activities and pigging operations will have the potential to negatively impact the health of individuals living, working and recreating within 2 to 5 miles of the compressor stations.

The chemicals detected in the ambient air associated with releases from compressor operations consist of:

Benzene
1,3-Butadiene
2-Butanone
n-Butyl Alcohol
Carbon Disulfide
Carbon Monoxide
Carbonyl Sulfide
Chlorobenzene
Chloromethane
Cis-1,2-dichloroethane
Cyclohexane
Cumene
Dichlorodifluoromethane
1,2-Dichloroethane
Diethyl Benzene
Ethane
Ethyl Benzene
Ethylene
Ethylene Oxide
Formaldehyde

n-Heptane
n-Hexane
Methane
Methylethyl Disulfide
Nitrogen Oxide
Propane
Propylene
Sulfur Dioxide
Tetrachloroethane
1,1,2-Trichloroethane
Trichloroethylene
Trifluoroethane
1,2,4-Trimethly Benzene
Toluene
m,p-Xylene
o-Xylene

The health impacts reported by community members living with in the area of impact of compressor stations consist of:

Nasal Irritation
Throat Irritation
Eyes Burning
Frequent Nausea
Allergies
Sinus Problems
Bronchitis
Persistent Cough
Chronic Eye Irritation
Shortness of Breathe
Severe Headaches
Frequent Nose Bleeds
Sleep Disturbances
Joint Pain

Difficulty in Concentrating
Nervous System Impacts
Irregular/Rapid Heart Beat
Strokes
Spleen Damage
Pre-Cancerous Lesions
Abnormal Mammogram
Increased Fatigue
Dizziness
Forgetfulness
Easy Bruising
Muscle Aches and Pains
Weakness
Tired
Ringing in Ears
Sores and Ulcers in Mouth
Urinary Infections
Depression
Decreased Motor Skills
Falling
Staggering
Frequent Irritation
Amnesia
Severe Anxiety
Excessive sweating
Abnormal EEG
Lump in Breast
Thyroid Problems
Endometriosis
Brain Disorders

Note: 61% of the health impacts were associated with chemicals present in the ambient air in excess or short and long term effects screening levels.

The most prevalent medical conditions in individuals living in close proximity to compressor stations consist of:

Respiratory Impacts	71% of individuals
Sinus Problems	58%
Throat Irritation	55%
Allergies	55%
Weakness and Fatigue	55%
Eye Irritation	52%
Nasal Irritation	48%
Joint Pain	45%
Muscle Aches and Pains	42 %
Breathing Difficulties	42%
Vision Impairment	42%
Severe Headaches	39%
Sleep Disturbances	39%
Swollen and Painful Joints	39%
Frequent Irritation	32%

Note: 90% of individuals surveyed reported experiencing odor events from the compressor stations.

The above listed chemicals and associate health impacts have the potential to negatively impact the health of citizens living within 5 miles of the proposed Wadsworth Compressor Station. The area of impact includes over half the city of Wadsworth as well as a number of additional communities. The prevailing wind direction in the area of the proposed Wadsworth Compressor Station indicates that the city of Wadsworth is downwind of the proposed compressor station.

Siting a compressor station in an area that will negatively impact the health of a number of communities as well as more than half of the city of Wadsworth is inappropriate and should be used as a reason to deny the air permit being proposed for the Wadsworth Compressor Station.