



MON VALLEY WORKS CLAIRTON PLANT

Operations & Environmental Report 2022

United States Steel

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MESSAGE FROM THE PLANT MANAGER



Michael S. Rhoads
Plant Manager
Mon Valley Works –
Clairton Plant

U. S. Steel has been a part of the Mon Valley for over 120 years, providing the steel to build America made by generations of proud United Steelworkers and U. S. Steel management employees. We know that to be a good neighbor, we must also continuously improve our environmental performance.

While I am proud of the environmental progress and achievements described in this report, under U. S. Steel's commitment to its Continuous Improvement to the Environment (CITE) program, we will never waver in our efforts to improve. Not only do we employ a formal CITE program in our training, but we have also embedded our CITE program in our day-to-day operations, as a commitment to environmental stewardship.

Our successes are a result of our resolve to always follow our S.T.E.E.L. principles - Safety First, Trust and Respect, Environmental Stewardship, Excellence and Accountability, and Lawful and Ethical Conduct which will be discussed in more detail in this report.

2022 presented several opportunities to further improve the Clairton facility, and the Clairton team maximized those opportunities, while delivering high quality metallurgical coke to our blast furnace customers. The coke making process is the essential first step in the integrated steel making process. The steel production that we (the Clairton Plant) support is critical for so much of the critical infrastructure that we rely upon in our everyday lives.

U. S. Steel's Clairton Plant continued its excellent environmental performance in 2022. The Plant performance is truly an example of our Environmental Stewardship and embodies our Corporate Environmental Policy; Environmental Excellence – Everyone, Everywhere, Every Day. I am extremely proud of this, and the pages ahead summarize some of our major successes during the year. With hard work and dedicated effort, the team at Clairton is doing our part to improve the region's air quality. These efforts have contributed to Allegheny County's air monitors demonstrating attainment with all Federal, health-based air quality standards!

In addition to the excellent environmental performance and looking ahead to the future, the Clairton plant implemented several Environmental related reliability projects at its By-Products facility in 2022. These projects included the following:

- Began work and made significant progress on a redundancy project at Clairton's biological water treatment facility.
- Completed the switching valve project to reduce SO₂ ahead of schedule.
- Completed a significant piping replacement project on the coke oven gas distribution system.
- Completed maintenance and reliability projects on the electricity generating system.
- Completed reliability maintenance on No. 2 Boiler to ensure reliable steam supply to the plant.

These achievements, as well as other environmental progress demonstrate U. S. Steel's commitment to Environmental Stewardship through the implementation of the STEEL Principles and the Clairton CITE program. U. S. Steel values our shared environment, employees and the communities in which we operate. Safety and environmental performance remain our top priorities, now and into the future.

UNITED STATES STEEL CORPORATION—S.T.E.E.L. PRINCIPLES

Our S.T.E.E.L. Principles are the foundation of a strong ethical culture at U. S. Steel. These five principles set forth clear ethical expectations for our Board of Directors, our leadership team and U. S. Steel employees worldwide. Conduct aligned with the S.T.E.E.L. Principles is essential to sustaining ethically and lawfully sound corporate citizenship, responsible environmental stewardship, and the principled management and leadership that are necessary for our continued success.



S SAFETY FIRST

U. S. Steel operates under the guiding principle that all safety-related incidents can be prevented and vests personal responsibility for operating under that principle in all its employees and contractors. Our company maintained an industry-leading safety program for many decades before the passage and implementation of government regulations, such as the Occupational Safety and Health Act and the Mine Safety and Health Act.

T TRUST AND RESPECT

The success of our company depends on all of us working together to achieve our common goals. We must build strong relationships with one another that are rooted in trust and respect while driving our culture of caring. By embracing the strengths and unique differences each of us brings to our work, we respect and learn from one another, foster a high-performance environment, and encourage every employee to reach his or her full potential. We want all employees to trust that our diverse backgrounds are valued and celebrated. Our Employee Resource Groups, several of which focus on inclusion and allyship of historically underrepresented groups in the workforce, support our increasingly diverse workforce and strengthen employee engagement and connection. In addition, our Inclusion and Diversity Council, led by our CEO, drives our enterprise-level inclusion and diversity strategy across our company. Ultimately, our company is stronger – and we can serve our customers better – when we bring together our diverse experiences, backgrounds and perspectives to create inclusive, well-rounded and high-performing teams.

E ENVIRONMENTAL STEWARDSHIP

Environmental stewardship and “Safety First” are inextricably linked. Just like safety, environmental stewardship is a core value of our company that is incorporated into our day-to-day operations as well as our strategic corporate decisions. We must operate our facilities in an environmentally responsible manner and take steps to protect and preserve our shared natural resources. Doing what’s right for the environment is also doing right for our business. Our commitment to environmental performance begins at the top with regular oversight by our senior leadership, and we continue to increase environmental awareness through regular training of our employees. Additionally, we are committed to establishing and maintaining documented environmental management programs that adhere to environmental laws and regulations, and many of our major facilities are ISO 14001-certified.

E EXCELLENCE AND ACCOUNTABILITY

Excellence and accountability are critical to sustaining our high-performance culture. Through our pursuit of excellence, we continue to challenge ourselves to build a better, more sustainable future for our employees, customers, and communities. Accountability is critical to the success of our company. Accountability means taking initiative by proactively identifying what needs to be done, developing an action plan, and executing that plan. It also means aligning our actions to our goals, taking responsibility for our decisions, and executing on our commitments to our stakeholders in a timely manner.

L LAWFUL AND ETHICAL CONDUCT

Each of us has a duty to conduct business ethically and in compliance with all applicable laws and regulations, including when interacting with our customers, suppliers, competitors, and other external parties. We must never take advantage of or provide special benefits to anyone – or even appear to do so – through manipulation, concealment, misuse of information, misrepresentation of material facts or any other unfair or improper practices. Fraud, theft, embezzlement, inflated billings, falsified expense reports and payment of kickbacks are all examples of illegal and unacceptable conduct.



These S.T.E.E.L. principles are the foundation on which we operate; and are reflected in the environmental progress realized by the Clairton plant operations as explained below.

OVERVIEW OF THE CLAIRTON PLANT AND THE MON VALLEY WORKS



Figure 1. The Clairton Plant – the largest coke plant in the western hemisphere, is located along the Monongahela River outside of Pittsburgh.

The Clairton Plant of the Mon Valley Works is located 20 miles south of Pittsburgh on 392 acres along 3.3 miles of the west bank of the Monongahela River.

The Plant has the capacity to produce approximately 4.3 million tons of high-grade metallurgical coke per year in 10 coke batteries comprised of 708 ovens. The Clairton Plant is the only remaining U. S. Steel coke-producing plant in the United States. This plant supplies coke needed for iron and steel production at the Mon Valley Works' Edgar Thomson Plant and other steel-producing locations. The Clairton Plant is the largest producer of high-grade metallurgical coke in the western hemisphere.

The significance of the Clairton Plant, including its products and byproducts, goes well beyond its geographical footprint. Clairton Plant's products are used as the raw material feed to other steel plants throughout the United States. In addition, its byproducts are used in chemical and manufacturing operations of many corporations.

The Clairton Plant operations have a tremendous impact on the local, regional, and national economy. The Clairton Plant employs approximately 1,400 highly skilled United Steelworker union-represented and non-represented employees. Since the Clairton Plant is the nation's largest producer of coke and coal chemicals, its operations have a multiplier effect in supporting thousands of additional steel plant, chemical, energy, transportation, and supplier jobs, not only in the Clairton area in Allegheny County, and Southwestern Pennsylvania region, but also across the United States. In fact, the Clairton Plant is an integral part of the three-plant steelmaking complex U. S. Steel calls the Mon Valley Works.

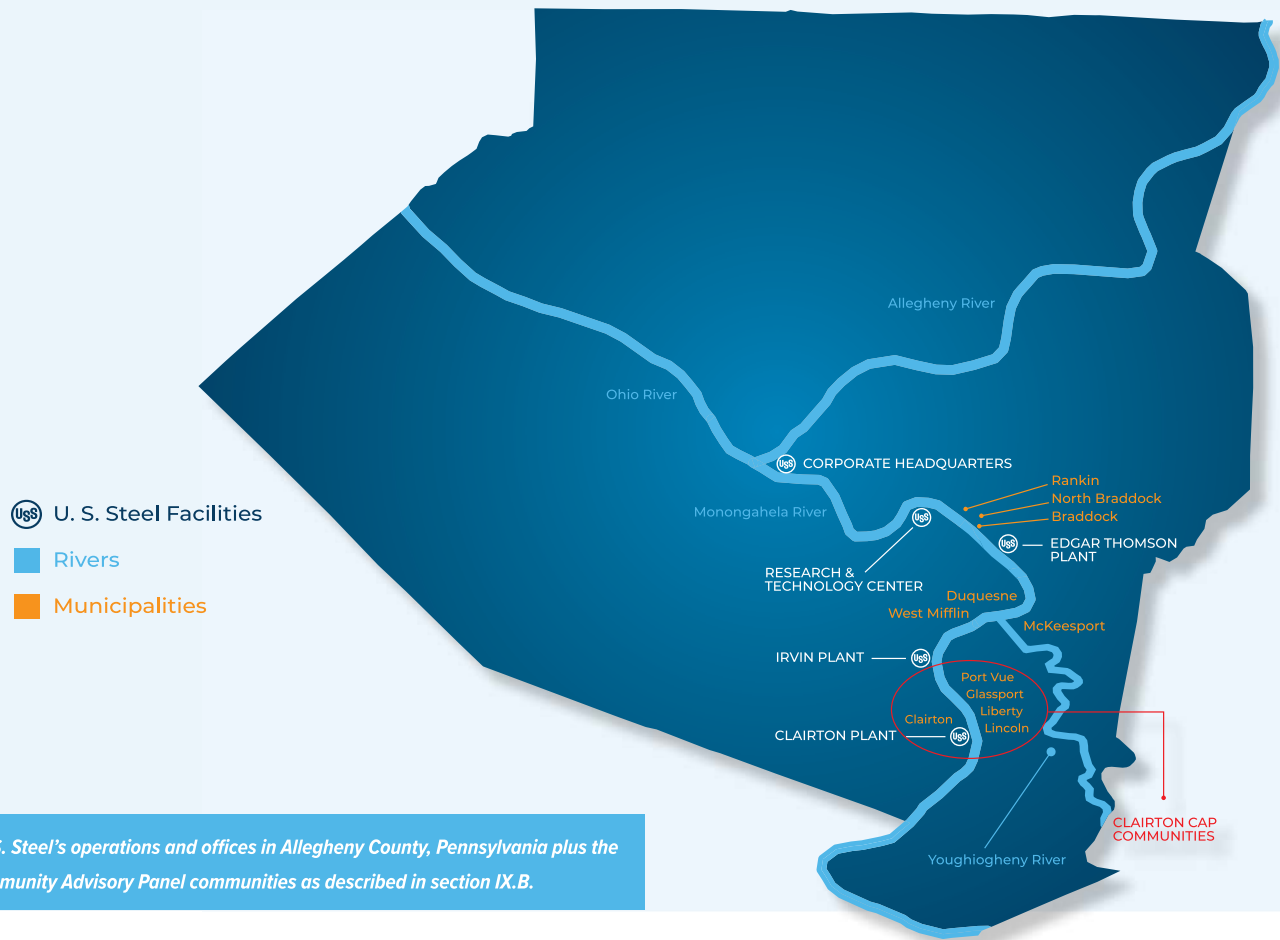


Figure 2. U. S. Steel's operations and offices in Allegheny County, Pennsylvania plus the Clairton Community Advisory Panel communities as described in section IX.B.

The Mon Valley Works consists of:

- 1) **Clairton Plant** – which, as explained, produces coke and coke by-products;
- 2) **Edgar Thomson (ET) Plant** – produces hot iron in blast furnaces, which is then converted into steel at the Basic Oxygen Shop; and turned into slabs at our continuous caster.
- 3) **Irvin Plant** – finishes and processes steel slabs
- 4) **Fairless Plant** – includes a finishing mill, located outside of Philadelphia, Pennsylvania

The Edgar Thomson Plant and Irvin Plant rely on the Clairton Plant for its metallurgical coke (which is used as a raw material in ET's blast furnaces) and coke oven gas which is used throughout the facilities as a clean fuel.

The economic impacts of the Mon Valley Works are significant locally as well as nationally. Steel is a critical foundation for our nation's economy, security, infrastructure, energy independence, and downstream manufacturing capabilities. The United States must maintain the ability to mine, melt and make the steel needed to defend, build, and power our country.

In 2018, the Federal government determined that domestic steelmaking is necessary for our nation's security production requirements and without domestic steel production we run the risk of not being able to adequately respond to a national emergency. Furthermore, the U.S. Department of Homeland Security has designated steelmakers like U. S. Steel, including its Clairton coke plant, to be a vital component of our nation's critical manufacturing sector, which is necessary for the economic prosperity, security, and continuity of the United States. The Covid-19 pandemic has highlighted the importance of having robust domestic manufacturing capabilities to supply important products that are essential to national, economic and health security.

While the Clairton plant has been producing coke for over 100 years, it has evolved, and continues to evolve, into a state-of-the-art manufacturing facility with a proven track record of environmental performance like no other coke plant in the world. The plant has experienced significant milestones over the last century, including, more recently, many that are environmentally related, as highlighted below:

HISTORY OF CLAIRTON PLANT

SIGNIFICANT MILESTONES

YEAR	TIMELINE OF EVENTS
1901	Built by St. Clair Steel Company
1904	Purchased by U. S. Steel
1918	Construction of 12 Koppers Batteries with total of 768 Ovens
1948	Maximum capacity of coke making achieved (approximately 8 million tons/year with 22 Batteries and 1,482 ovens)
1973	Coke Oven Gas Desulfurization Plant Installed
1977	Coke capacity reduced to approximately 5 million tons/year
1982	B Battery commissioned
1988–1990	Pushing Emissions Controls Installed
1991	By-Products Plant Upgrades
2001	Pushing Emissions Control Baghouse Improvements
2005–2008	B Battery Through Walls Replaced
2008	Plant status: 12 Batteries with 816 ovens in operation
2009	3 Batteries permanently shut down – 624 operating ovens
2010–2020	Batteries 13-15 Major Refractory Upgrades
2010–2020	Batteries 19-20 Through Walls Replaced
2011–2020	Batteries 1-3 Endflues Replaced
2012	C Battery Start-up: 10 batteries with 708 ovens with capacity of approximately 4.3 million tons of coke/year
2013	2 additional Low Emission Quench Towers constructed (Reductions: 1,107 tons of TSP, 301 tons of PM10, 812 tons PM2.5)
2018	Coke Oven Gas Desulfurization Vacuum Carbonate Upgrades
2020	New High Efficiency Bags installed on Pushing Emissions Control Baghouses - completed May 2020
2021	Electrical system to #1 Control Room 5kV switchgear upgraded 2022 By-products switching valve project (SO ₂ reduction project) completed
2022	By-products switching valve project (SO ₂ reduction project) completed

SAFETY

Safety Policy

“Safety First” is our primary core value. To support this, U. S. Steel is committed to:

- Providing safe and healthy working conditions for the prevention of work related injury and illnesses in the workplace.
- Continual improvement of the occupational health & safety management system.
- Consultation and participation of workers through engagement.
- Complying with legal requirements and other requirements.
- Eliminating hazards and reducing occupational health & safety risks.

In simple terms, our safety policy and primary core value is “Safety First.”

Safety Program Framework

Our program framework consists of:

Shared Responsibility: U. S. Steel promotes safety and industrial hygiene management as a core value by conducting operations in a safe manner and recognizing that the accountability and responsibility for safety and industrial hygiene management

extends from each individual employee to the top executive of each business unit.

Empowered Leadership: U. S. Steel vests managers and supervisors with safety and industrial hygiene responsibilities and provides leadership and support to them from safety and industrial hygiene personnel.

Intentional Design: U. S. Steel integrates safety and industrial hygiene management systems and processes as essential elements in all functions by establishing and maintaining plans, objectives, and programs and by providing resources from implementation and program maintenance.

Third Party Requirements: U. S. Steel requires contractors and suppliers to conduct their activities consistent with this policy and in accordance with the U. S. Steel Contractor Safety Standard Specification.





Figure 3. A copy of a wallet sized “Stop and Act” card (top-left), a photo of an employee signing Clairton’s Safety Banner (top-right)

Some of the in-plant safety engagement initiatives we’ve encouraged over the last year include:

- **STOP & ACT** – Every U. S. Steel employee is empowered to STOP work for conditions that endanger individuals, equipment, or our work environment.
- **Annual Safety Commitment** – At the beginning of every year, all U. S. Steel employees are invited to give their commitment to safety by signing the plant safety banner.
- **Safety Conversations** – We have established a process in which all members of the organization can engage with one another about work practices, conditions, and/or safety concerns about a job in a non-threatening and collaborative way.
- **Safety Focus & Engagement Teams** – We establish teams comprised of management and represented employees that meet regularly to address plant issues and concerns. These teams identify injury trends and plant issues and then implement initiatives to minimize and eliminate risk. These teams develop engagement activities to involve all Clairton Plant employees and investigate and implement new tools and technology to solve safety issues.

STATE-OF-THE-ART FACILITY

As explained in Section II, above, while the Clairton Plant has been a vital part of Allegheny County, Pennsylvania for over 120 years, it is and continues to evolve into a state-of-the-art facility. While the fundamentals of coke-making have not changed, the ancillary

operations and the technologies used have significantly evolved to be more environmentally friendly and efficient. The diagram provided below provides a high-level summary of the Clairton plant's operations:

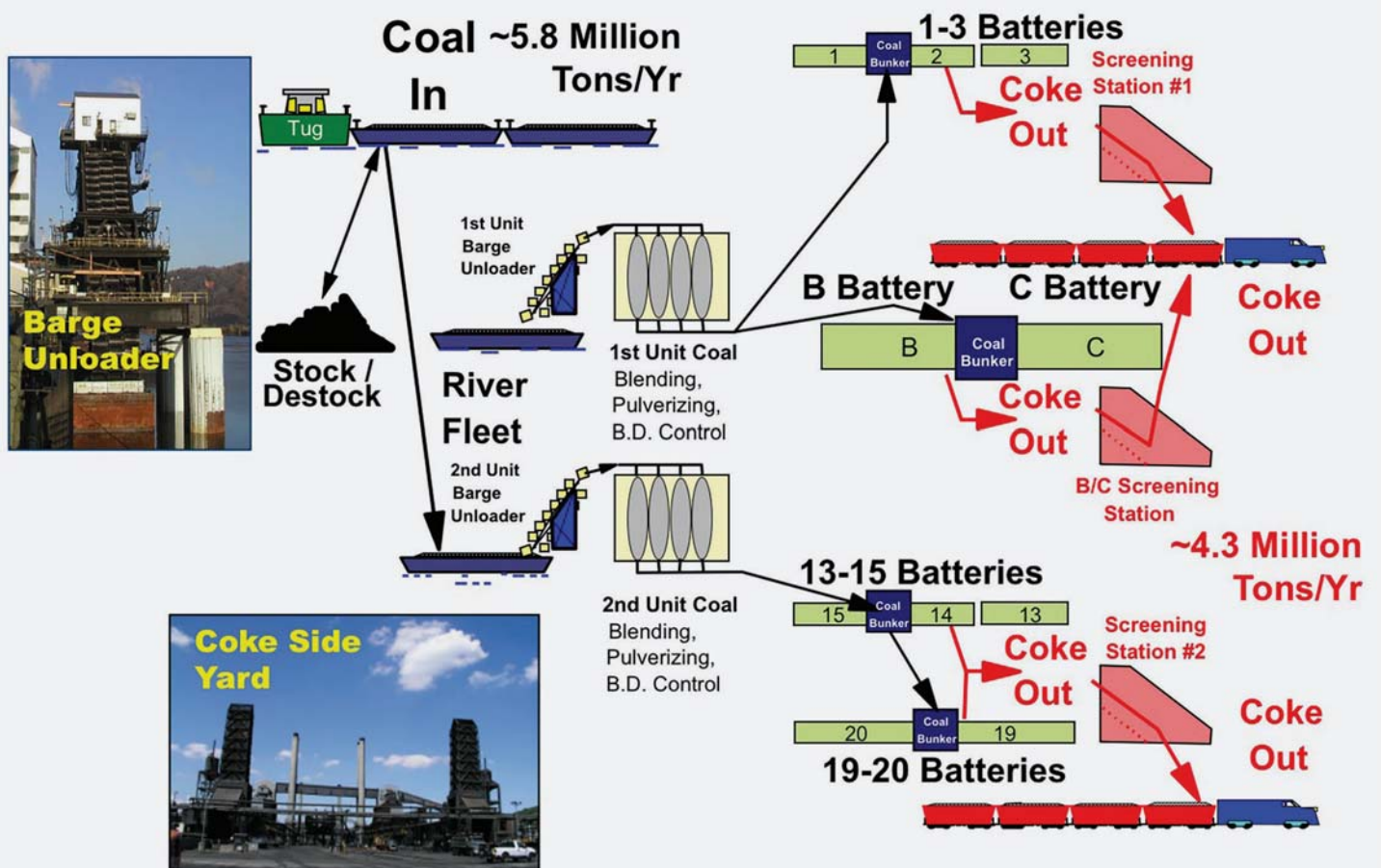


Figure 4. Clairton Plant – General Plant Process Flow Diagram: showing from left to right; the coal being brought by barge to the plant, coal blending & pulverizing operations, coal being charged to the batteries, and coke produced, screened and loaded into railcars for customer delivery.

A. Coke Batteries

Coal is a mineral consisting mainly of sedimentary fossilized carbon with smaller amounts of other elements, such as sulfur, hydrogen, oxygen, nitrogen, and more. Coal is found under the earth's crust as lignite, or brown coal (the lowest ranking coal), bituminous coals, and anthracite. It is extracted either from underground by shaft mining or at ground level by open-pit mining. The bituminous coals are used at the Clairton plant to produce metallurgical coke.

According to the U.S. Energy Information Administration, in 2019, coal makes up about 23.4% of the United States electricity

generation and is also used in the production of metallurgical coke for blast furnace fuel. Some smaller blast furnaces can utilize charcoal as a carbon source, but larger blast furnaces require the strength and durability of coke. U. S. Steel operates a number of blast furnaces throughout the corporation. The coke supplied by Clairton is a key ingredient that fuels our blast furnaces to produce the iron that is refined to steel at the basic oxygen process (BOP) shops. The steel is molded into steel slabs at our continuous caster operations and sent to our various finishing facilities to be rolled and coated into the final customer-specific products.

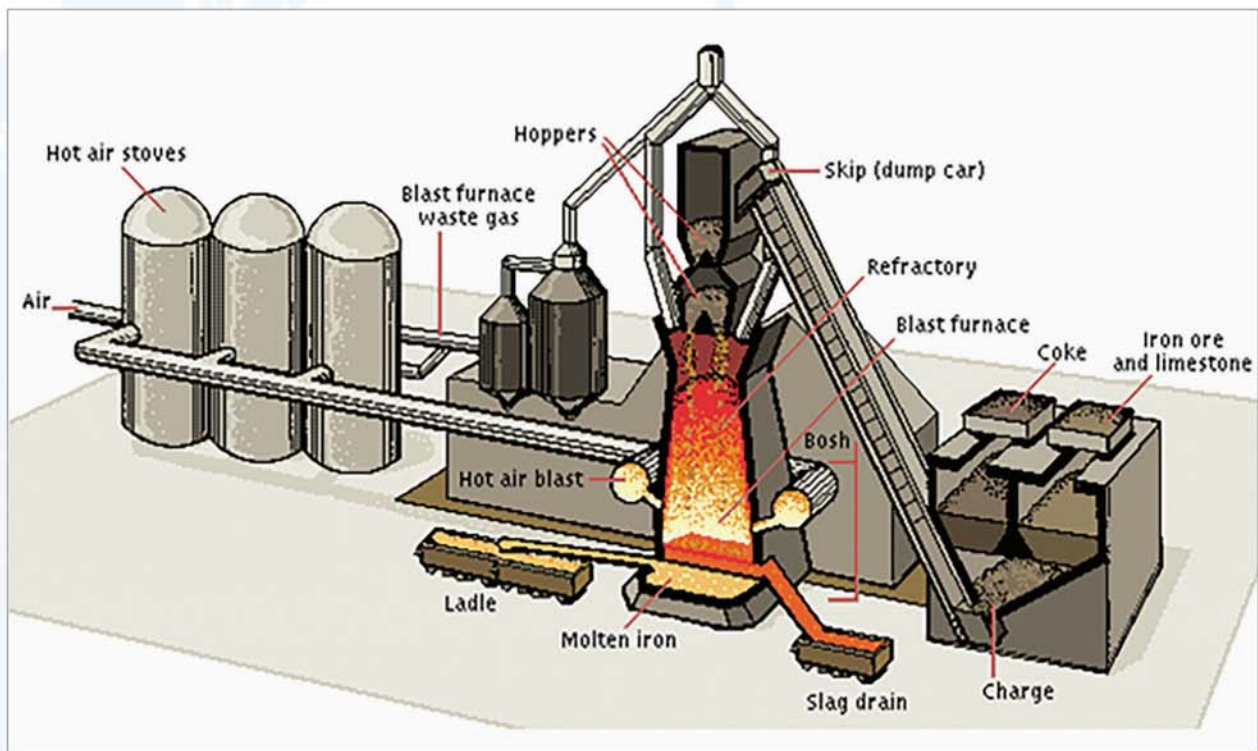


Figure 5. A blast furnace operations overview showing coke, iron ore, and limestone storage and charging into a blast furnace where molten iron is produced. The molten iron is then transferred to a Basic Oxygen Process to be converted from iron to steel.

COKE

...is a **fuel** to supply heat and a **reductant** to reduce the iron ore to elemental iron.

...**permeability** lets wind, hot blast air, travel up through the furnace.

...**supports the burden or layer** of iron ore and limestone in the furnace.

To produce the coke needed to directly reduce iron, bituminous coal is superheated under reduced oxygen conditions in oven batteries specially designed for this process. A coke battery is made up of multiple ovens. Coal is crushed and blended prior to being moved to the coal storage bunkers located on each battery unit. The coal is transferred from the coal storage bunker to each oven by a coal charging railcar called a larry car. A larry car is a specially designed railcar that transports the coal from the coal storage bunker to each oven and also includes specially designed chutes to “charge” each oven with the blended coal. Coal is dropped into the ovens through four coal charging holes. The coal is heated, or baked, at approximately 1,900 degrees F for 18 hours in the ovens. During that time, gases, including the volatiles of the coal, are driven off by the heat into the off-gas piping system to be further processed downstream. The pure carbon that remains in the oven is called “coke”.

Once the coke is produced the pusher side and coke side doors of the oven are removed. A “pusher” machine is then positioned in place where the pusher machine ram “pushes” the coke through an 18-inch-wide slot into a rail mounted catch, or quench, car. When the coke is pushed from the oven into the quench car, it is quickly moved to the battery unit’s quench towers to cool the coke and stop the burning process. The cooled coke is then dumped onto a coke wharf where it is taken to a facility to be screened and sized prior to being charged into the blast furnace. The figures below show a typical layout of a coke plant and the current coke battery configuration at the Clairton Plant:

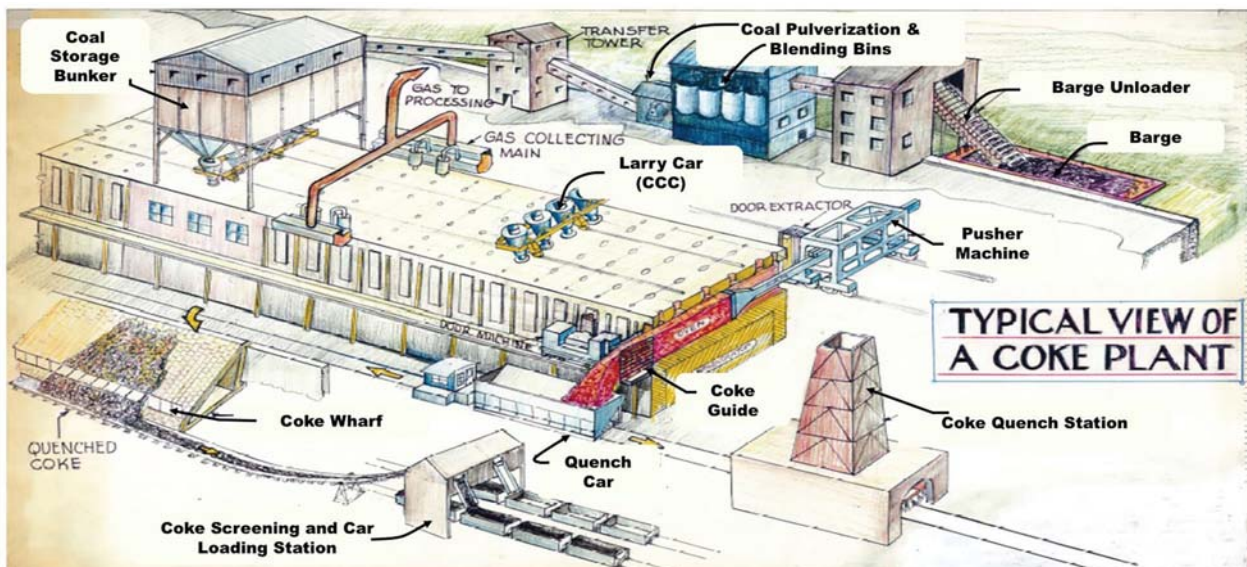


Figure 6. Overview of a typical coke plant with a side view of an oven cut-out.

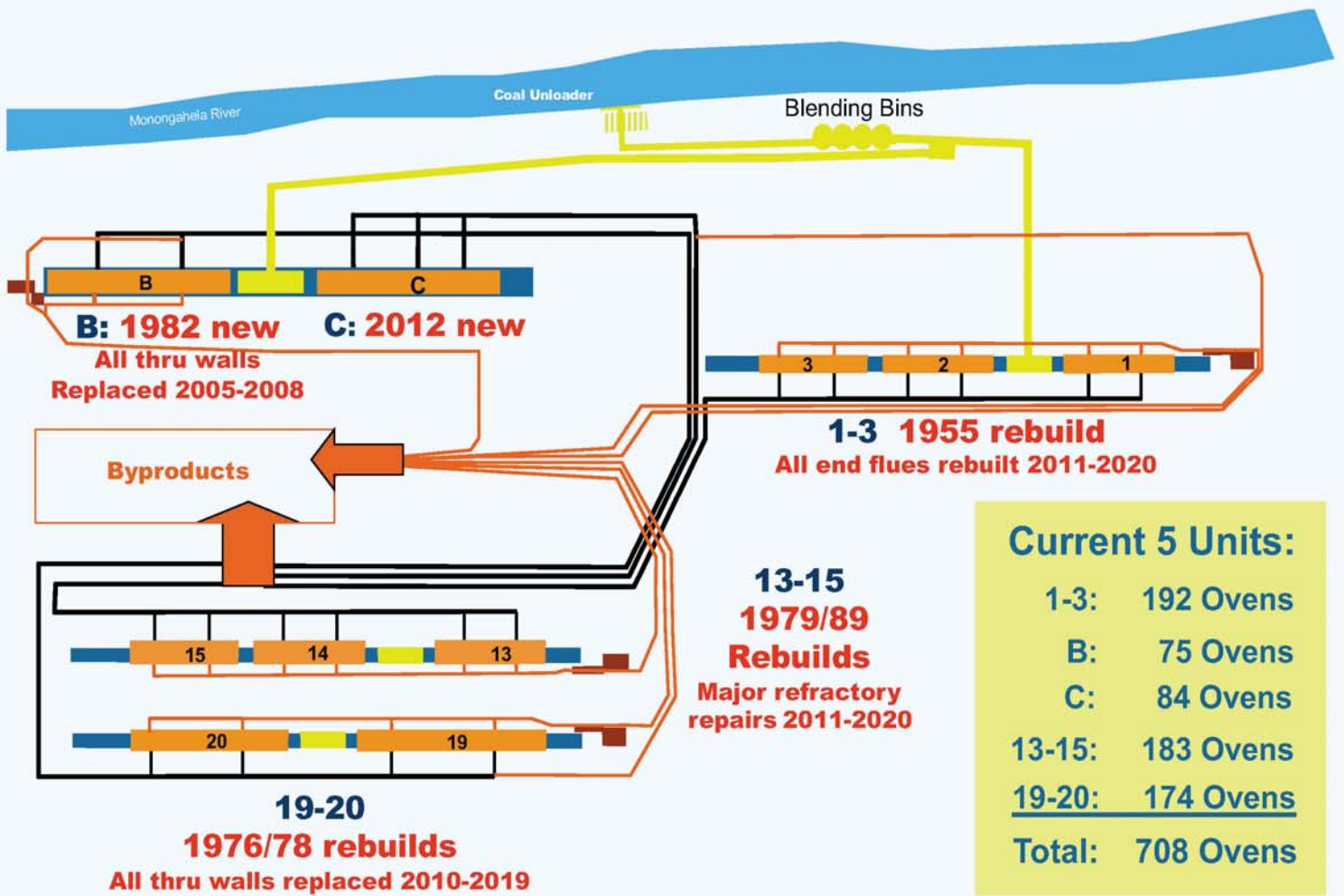


Figure 7. Clairton Plant – Battery Configuration in 2019.

B. Environmental Controls – Highlights

As indicated above, the Clairton Plant coking facility consists of ten batteries ranging in height from 3.6 to 6 meters, which have an annual coke capacity of 4.3 million tons. There are several potential emission points throughout the coking process that U. S. Steel and the regulating agencies monitor. Specifically, emissions are monitored during the process of charging coal into the ovens, during the pushing of the coke out of the oven and into the quench car, during the travel of the coke-filled quench car to the quench tower, at the doors on each side of each oven, at the lids that cover the charging port the coal enters the oven through, at the offtake piping on each oven that carries the off-gases to be processed, and at the combustion stacks from which the by-products of combustion from natural gas and coke oven gas exit the batteries after the heat is used to bake the coal. While each battery is unique, air emissions are minimized at each potential emission point either through the installation of control equipment, such as the pushing emissions control baghouses, or the implementation of advanced employee work practices.

Stage Charging - Batteries 1-3, 13-15, 19-20 and B

We have installed gravity-discharge larry cars and screw conveyor larry cars to more evenly charge the coal into the ovens. Larry cars operate on top of the batteries delivering coal to each oven. The coal is brought over to each of the batteries via conveyor systems. The act of delivering coal into each of the ovens is called, “charging”.

Stage charging involves the planned sequential release of fixed amounts of coal from the hoppers of the larry car in conjunction with high-pressure steam aspiration and leveler bar operation. Stage charging is a detailed charging procedure that evenly distributes the coal into the oven, aimed at reducing charging emissions, reducing the number of passes made by the leveler bar and keeping the tunnel head open to the gas collecting main. Without a clear path for the off-gases to travel, the oven pressure increases, and the gases may escape out of the lids or the doors providing for a higher likelihood of emissions. To complete the charge properly, lidmen, who are trained to remove and replace oven charging hole lids, replace the lids as soon as the coal charging hopper runs empty to minimize air infiltration and visible charging emissions.

Coke oven door design and improved operating and maintenance techniques continue to improve with the Clairton Plant being a leader in innovation. Coke oven doors are taken off and put back on each oven after a coking cycle is complete. Clairton has its own door repair shop on-site with the expertise to repair doors more efficiently than taking them offsite for repair. Door coordinators continually stop door leakage and make door adjustments to minimize door leakage around the clock.

Clairton Innovative Coke Battery Door Design Project

U. S. Steel has worked with a third party to design and trial an innovative adjustable door seal technology for use at its Clairton Plant. A unique adjustable door seal has been designed for the coke side and pusher side doors of 1-3 Batteries, 13-15 Batteries, 19-20 Batteries and B Battery. The design includes an improved new seal arrangement and new seal components made of more durable and flexible material. The new design allows the door to seal better than the current door design. Clairton continues to look for opportunities through alternative designs and materials to improve door sealing on all units and is currently trialing a second unique design on several batteries to evaluate its performance.

Figure 8. Lidman replaces the lid after the coal has been charged into the battery





Top: Figure 9. Left: Above is a picture of the new door seal that is adjustable, seals better, and allows for better maintenance.

Middle: Figure 10. Central Door Repair Shop where doors are repaired, and the new design is implemented.

Bottom: Figure 11. New Door Plug. Door plugs fit into the oven and are used to reduce emissions while lowering heat losses from the oven chamber through the door.

Automatic door and jamb cleaners are installed on the coke side of all batteries to further reduce emissions. The door and jamb cleaners will remove any buildup or debris where the face of the door mates with the battery. This ensures proper seating. The positioners, or locators, on the door machines ensure that the doors are placed back in the proper place for each oven.

Heating effects the quality and quantity of the coke produced from the destructive distillation of the coal but also impacts potential emissions. Even and controlled heating through each oven and each battery is essential. Clairton has been a leader in developing flue temperature monitoring to ensure consistent heating.

Due to the fluctuations of extreme temperatures (thermal shock) over time, there are occasions when the refractory brick will need to be patched/repared. Again, Clairton has been a leader in the development of advanced patching practices including wet slurry, dry gunning, fused silica dry gunning, and ceramic welding patching techniques.

13-14 Battery Regenerator Project

Clairton has undertaken a capital improvement project to clean out regenerators on 13 and 14 Batteries. The regenerators preheat ambient air that is mixed with coke oven gas to heat each oven wall. Cleaning of the regenerators will improve air flow into the flues and improve coke oven gas combustion and oven heating efficiency. Over time, debris which falls to the base of the flue will fall into the air-ports and down into the regenerator chamber. Blocks of 3 ovens at a time are required to be out of service and gas sources isolated from both heating walls of the regenerator to be cleaned. Then, the regenerator brick has to be mined out as deep as the center pusher side and coke side division wall and rebuilt. This project has a positive environmental impact on push, travel, and battery stack performance.

Cryogenic Coke Oven Gas Process

To our knowledge, the Clairton Plant has the only cryogenic coke oven gas (COG) separation facility in the world. While many coke plants throughout the world do not employ any coke oven gas desulfurization, the Clairton Plant has enhanced the cryogenic process. Per the Association for Iron and Steel Technology (AIST), the desulfurization process at the Clairton Plant provides the lowest hydrogen sulfide, clean coke oven gas on the North American Continent. The hydrogen sulfide gas content of the cleaned coke oven gas is well under half the hydrogen sulfide content of those coke plants that desulfurize coke oven gas through other processes and is approximately 90% lower than those that do not desulfurize coke oven gas.

As discussed below in the by-products section, the cryogenic process produces much cleaner and consistent coke oven gas, which is a benefit for the combustion users including the battery heating.

Pushing Emissions Control Systems

Once the coking cycle is complete, the coke is “pushed” out of the oven via a “pusher” machine. Emissions from the pushing process are captured by the Pushing Emission Control Systems (PECs). PECs are installed on all 10 Batteries. PECs on 9 of the batteries use a traveling canopy hood over the coke cars to capture pushing emission and a baghouse to control emissions. The pushing emissions on B battery are captured and controlled by a fixed coke-side shed and baghouse as opposed to the traveling canopy hood.



Figure 12. PEC Baghouse for #1 Unit (Batteries 1-3).



Figure 13. PEC Baghouse Infrastructure and PEC Baghouse Batteries 13-15 showing the coke guide enclosure, PEC hood and 13-15 & 19-20 PEC, or second unit, baghouse.

As noted above, the Clairton plant has five Pushing Emissions Control (PEC) baghouses to capture and control particulate matter emissions from “pushing” the coke out of the battery ovens after the coal-to-coke oven cycle is complete. These five baghouses capture and control the pushing emissions from all 10 batteries.

U. S. Steel Clairton plant has committed to improving the emissions control performance of all five PEC baghouses by installing new cages and upgrading the systems by using high control efficiency bags. These improvements were completed in 2020. The high control efficiency bags are 92% efficient at removing the particulate matter 2.5 microns or less (PM2.5). The previous baghouse bags were approximately 80% efficient at removing PM2.5. This is a 15% increase in control at all five baghouses resulting in a significant emissions reduction of PM2.5.

C. Low Emissions Quench Towers (LEQT)

Once the coke is pushed out of the oven, the coke is quenched at quench towers to stop the coke from burning. While the coke from all batteries is quenched, Low Emissions Quench Towers (LEQTs) have been installed for C Battery, Batteries 13-15, and Batteries 19-20. As shown below, LEQTs are much higher, have a much larger cross-sectional area, and have a state-of-the-art double baffle configuration that leads to significant reductions of particulate emissions during the coke quenching operation. A photo of the new LEQTs for Batteries 13-15 (Quench Tower 5A) and Batteries 19-20 (Quench Tower 7A) is provided below. Quenching coke from C Battery is also conducted in an LEQT.

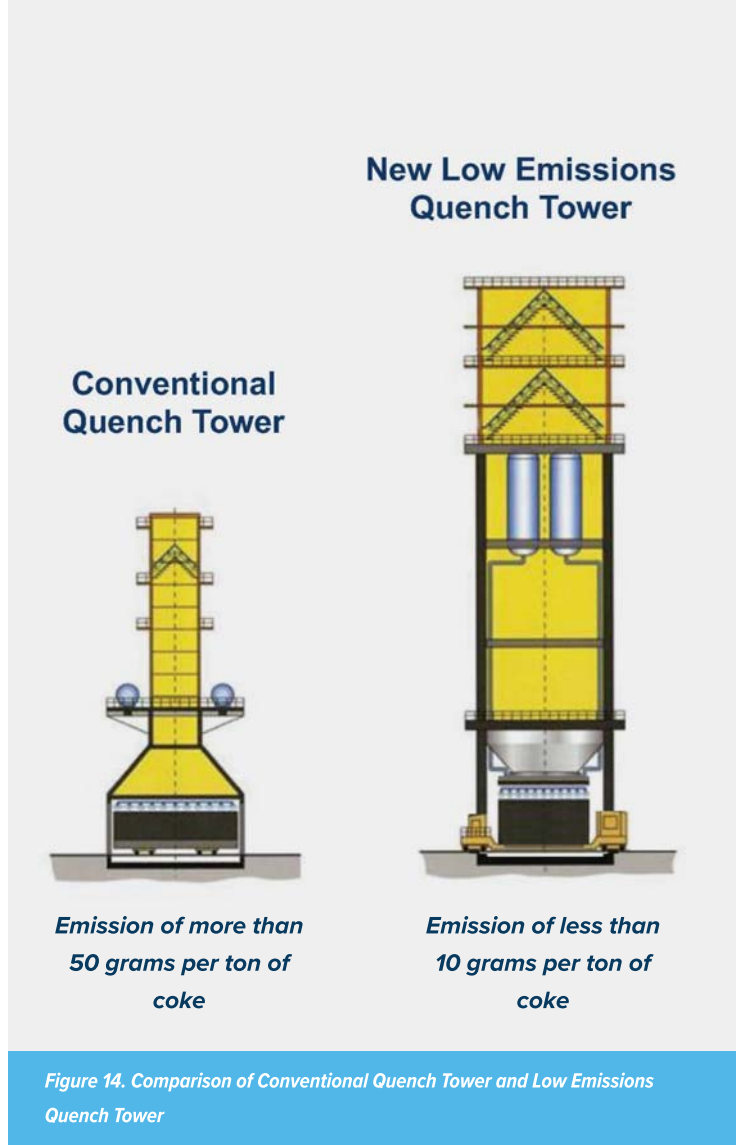


Figure 15. 5A and 7A LEQT – installed in 2013



D. C Battery

C Battery is the most advanced by-product battery in the United States. It was installed and commenced operation in November 2012. It consists of 84 large ovens with dimensions of 6 meters in height x 18 inches wide (average) x 16.7 meters in length. Each oven is made with specially designed refractory brick. The brick is designed to withstand temperatures as high as 2,650 degrees F.

Charging emissions are reduced by using a screw feed larry car to allow for more controlled charging of coal into the ovens. C Battery is the only battery in the United States equipped with the state-of-the-art Pressure Oven Regulated system or PROven® technology. PROven® is an electronic control system that individually controls the pressure in each oven depending on the stage of coking that oven is experiencing. The collector main is maintained at a negative pressure to draw the off gases released during charging and coking thus reducing emissions, and high spikes in oven pressure are reduced significantly. In addition, a low NOx heating system reduces the amount of coke oven gas per ton of coal charged as compared to traditional batteries.

The Pushing Emission Control (PEC) system consists of a hood that is integral to the door machine to reduce pushing fugitive emissions whenever a door is opened. U. S. Steel has also installed a Low Emission Quench Tower to significantly reduce particulate emissions during the coke quenching operation.

C Battery replaced three older batteries (Batteries 7-9 which were permanently idled) and resulted in reductions of hundreds of tons of particulate matter.

E. By-Products Plant and Emissions Controls

The Clairton Plant maintains and operates a state-of-the-art by-products plant that recovers tar, ammonia, light oil (benzene, toluene, and xylene), and elemental sulfur from the coke oven gas (COG). The general process flow diagram below provides a high-level summary of the by-products plant.

The by-products plant utilizes axial compressors to draw the raw coke oven gas into the battery topside collecting mains and through the primary coolers where tar, naphthalene, and water are recovered.

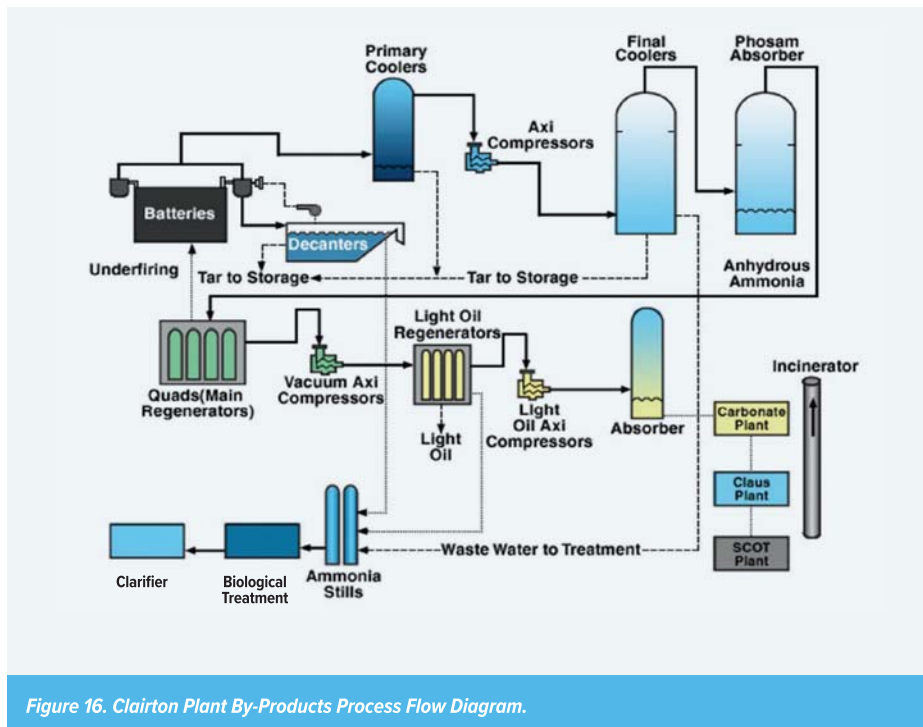


Figure 16. Clairton Plant By-Products Process Flow Diagram.

The raw coke oven gas is drawn through the #1 Control Room axial compressors and then pushed through the U. S. Steel patented PHOSAM process to recover ammonia before being processed at the #2 Control Room cryogenic gas separation plant.

The cryogenic gas separation plant utilizes vacuum compressors to pull and push the raw coke oven gas through the main regenerators which removes

and concentrates the hydrogen sulfide and light oil from the raw coke oven gas. The light oil is recovered in a separate heat transfer, separation, and cryogenic process at #2 Control Room.

The #5 Control Room desulfurization plant converts the concentrated hydrogen sulfide through catalytic technology into elemental sulfur in molten form.

The contaminated water treatment plant is responsible for processing all contaminated water generated by the coke oven gas cleaning process. Here, it is treated to meet technological and water quality-based effluent limitation limits before discharging into the Monongahela River.

A few facts about the Clairton by-products facility:

The cryogenic gas separation facility for coke oven gas is the only one of its kind in North America and, to our knowledge, in the world providing a high-quality gaseous fuel. The facility is capable of removing significantly more light oil than traditional by-products facilities.

The Clairton by-products facility, especially the desulfurization facility, is capable of removing more hydrogen sulfide than traditional by-product desulfurization units. At the Clairton Plant's state-of-the-art desulfurization plant, the process removes the coke oven gas hydrogen sulfide content to a level that is well less than half of traditional desulfurization process and well over 90 percent less than the majority of coke plants which do not desulfurize coke oven gas.

In 2016, upgrades were made to Clairton Plant's coke oven gas (COG) desulfurization process, specifically an innovation at the Vacuum Carbonate Unit (VCU) that reduces the concentration of hydrogen sulfide (H₂S) in the coke oven gas. Within the VCU, the COG passes through a soda ash solution in a trayed absorber column. The H₂S is absorbed by the soda ash, and the desulfurized gas exits the absorber column as a desulfurized fuel. The COG processed through the desulfurization process is combusted across multiple units throughout the Mon Valley Works plants (Clairton, Edgar Thomson, and Irvin).

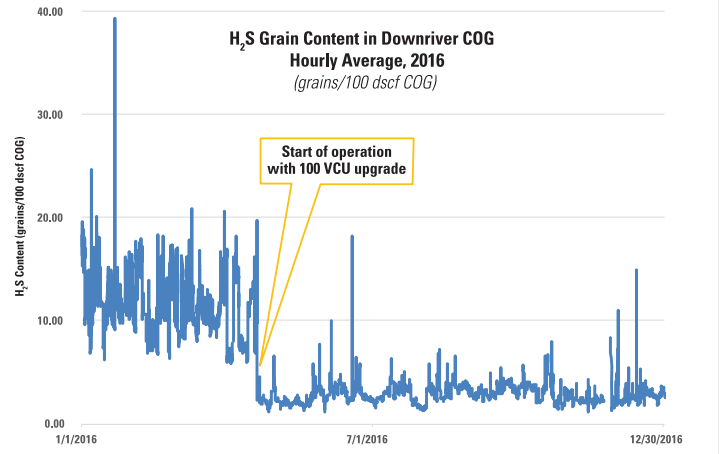


Figure 17. The above figure, as depicted in the September 2017 Allegheny County Health Department (ACHD) State Implementation Plan (SIP) Revision shows hourly H₂S grain content in COG in 2016, before and after the desulfurization process upgrades. The upgrades were completed on April 20, 2016, leading to significant decreases in sulfur content in COG. We continuously monitor the results to demonstrate continuous efficient operation of the desulfurization process.

In addition to its superior efficiency and hydrogen sulfide removal, the state-of-the-art Clairton desulfurization process includes redundancy which allows maintenance to be performed without losing the ability to desulfurize COG whereas traditional by-product facilities require a two to three-week maintenance outage at which time such facilities are not desulfurizing coke oven gas.

In North America, according to the most recent AIST data, there are 12 coke plants operating. Of the 12 metallurgical coke plants in the United States, only four of them currently desulfurize coke oven gas. Of the 4 that desulfurize, USS Clairton has the highest efficiency from an H₂S removal standpoint and is subject to the most stringent H₂S standard in the United States.



Products from Coke Batteries and By-Products Plant

While the By-Products Plant provides a significant environmental benefit by cleaning the coke oven gas (COG), which reduces emissions when the COG is combusted, the materials recovered in the Clairton by-products facility are sold as product and not disposed of as solid waste, providing a benefit to the environment. The quantity of coal charged and each of the by-products recovered is shown below in table below.

- **Metallurgical Coke** is a fuel and reducing agent in blast furnaces.
- **Coal Tar** is a feedstock for producing electrode binder pitch, roofing pitch, road tar, and numerous basic chemicals.
- **Light Oil** is an important source of aromatic chemicals, principally benzene, a chemical essential to the production of materials such as polystyrene and ABS plastics.
- **Anhydrous Ammonia** is a high-quality agricultural fertilizer and a chemical feedstock.
- **Sulfur** is a basic industrial chemical commodity, and **Coke Oven Gas** is a high-quality fuel similar to natural gas at half the heating (MMBtu/scf) value.

	Daily	Annual	Units
Coal Charged	15,918	5,810,204	Tons
Coke Produced	11,700	4,270,500	Tons
Tar Recovered	119,388	43,576,531	Gallons
Light Oil Recovered	44,571	16,268,571	Gallons
Anhydrous Ammonia Recovered	44	15,978	Tons
Elemental Sulfur Recovered	42	15,397	Tons
Coke Oven Gas Recovered	192,612	70,303,469	MCF

Table 1: Coke Batteries and By-Products Plant Recoveries based on Current Clairton Capacities

By producing these products, the advantages of employing a state-of-the-art by-products facility are not only realized locally, but these benefits are also felt throughout the country.



Figure 18. By-Products Piping and Tank Improvements.

2022 By-Products Improvement and Reliability Projects

Clairton’s Contaminated Water Treatment Plant is a biological treatment system that utilizes microbiological organisms to consume and eliminate toxic chemicals in the wastewater. Clairton’s water treatment plant is adding a level of redundancy by installing a roof and equipment to the current three-million-gallon T-1 process tank. T-1 tank currently spares the existing T-2 Biological Basin Feed Tank. By installing a roof and pumping equipment, T-1 will also be able to spare T-3 Still Feed Tank. Picture below is of the roof structure and plating being installed.

The main regenerator process at #2 Control Room is made up of 24 main regenerators, 96 top switching valves and a network of gas distribution piping. Striving to improve SO2 emissions from battery stacks, all 96 switching valves were removed and rebuilt to improve closure capabilities lower the H2S in the underfire gas. This project began in 2018 and committed to ACHD to complete by end of 2022. Picture below is of a newly rebuilt and installed switching valve. Project was completed in June 2022.

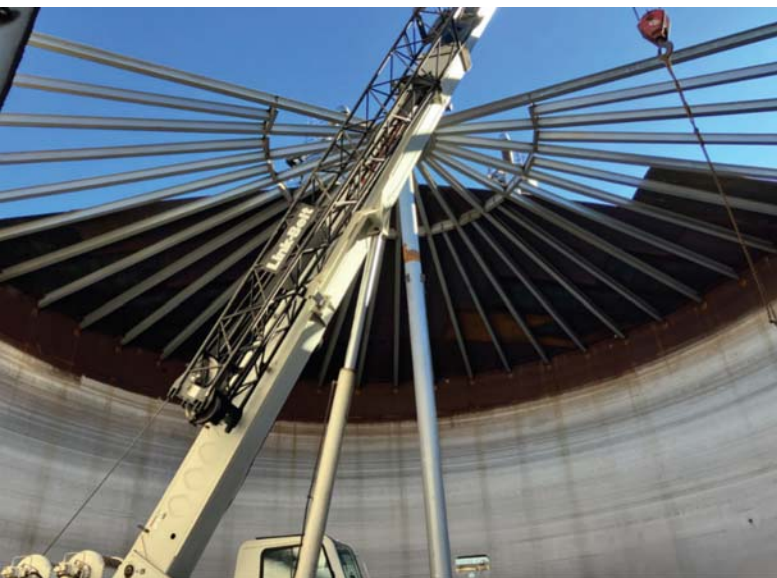


Figure 19. Contaminated Water Treatment Tank T3 Work in Progress



Figure 20. Clairton Switching Valve



Figure 20. Coke Oven Gas Transport Lines



Figure XX. 2021 Boiler House Painting

A primary portion of the Clairton Plant's power generation system is a steam driven 20MW generator that reduces the amount of power needed to be produced from external suppliers. In 2021, preventive maintenance outage planning began and the outage was executed in 2022. Original equipment manufacturer performed inspections and maintenance activities of this generator

The Clairton Plant makes its own steam that is used for heating, power generation and coke making/chemical processing. Each year our boilers are taken offline for inspection and follow up routine maintenance. In 2022 routine maintenance was performed on Clairton's #2 Boiler superheater tubes and air heater tubes. Figure X shows superheater tube and air heater tube work in progress.



Figure XX.



Figure XX. No. 2 Boiler Superheater Tubes

ENVIRONMENTAL TRAINING



Figure X. U. S. Steel Clairton plant's current ISO 14001 Certificate of Registration.

U. S. Steel invests significant resources to ensure that its employees are properly trained in all aspects of their responsibilities to ensure, among other things, that environmental compliance is achieved. This is conducted in many different ways, including one-on-one training as well as more comprehensive training programs, such as those related to ISO 14001.

A. Environmental Management System and ISO14001 (2015)

The Clairton Plant is firmly committed to environmental compliance, beginning with the incorporation of International Organization for Standardization (ISO) 14001 into our environmental management systems.

ISO 14001 standards seek to assist a company or an organization to “minimize harmful effects on the environment caused by its activities, and to achieve continual improvement to its environmental performance.”

The Clairton Plant is certified in compliance with this standard and has been since 1998, having become the first coke plant in the country to obtain certification.

There were two ISO 14001 surveillance audit events in 2022, a recertification audit in February and a surveillance audit in August, and the Mon Valley Works achieved approval of the ISO 14001 Environmental Management System as a result of each audit.



CONTINUOUS IMPROVEMENT TO THE ENVIRONMENT

Figure X. Clairton Plant's Environmental Policy.

B. Continuous Improvement To The Environment (CITE)

The Clairton road to environmental responsibility and excellence begins by focusing on people and encouraging each employee to participate fully. This is being achieved through a comprehensive training approach – the Continuous Improvement to the Environment training program.

CITE Training is a classroom program with the addition of practical field training focused on environmental practices and improvement at the Clairton plant. The training program is an eleven-part program that touches on all aspects of the coking process, their environmental impact, procedures, and best-practices to mitigate environmental impacts from each potential emission point in the coke-making process. This program consists of environmental impact awareness training, learning relationships between processes and equipment, and the ways specific workers' actions and operating conditions affect upstream and downstream operations. Environmental regulations are reviewed as well as the role of the employee in maintaining the plant in compliance with the regulations.

The CITE programs includes, but is not limited to the following:

- Environmental Awareness for Air, Water, and Waste regulations and permits

- Coal Handling Operations and Procedures including coal crushing, screening, blending, and transport
- Larry Car Operations and the charging of batteries
- Lidman Procedures and other top-side battery operations
- Pusher Machine Operations for pushing the coke out of the ovens into the quench cars
- Door Machine Operations for removing doors, cleaning the door and door jambs, and replacing the doors
- Heating Procedures to review proper battery heating techniques
- Patching Procedures for minor oven wall repairs
- Repair and Maintenance of the various process and ancillary coke-making equipment
- And other miscellaneous equipment and procedure reviews

This program reiterates to employees that the environment is everybody's responsibility and that procedures must be followed for U. S. Steel to meet its environmental requirements. U. S. Steel requires that all employees who work at the coking operations at the Clairton plant are trained in the CITE program. Implementation of this program has helped Clairton workers improve their environmental awareness and work practices which results in a culture of environmental awareness. In 2022, U. S. Steel continued to provide our "Continuous Improvement to the Environment" program to all employees/workers assigned to work at the coking operations at the Clairton plant.

ENVIRONMENTAL PERFORMANCE – AIR

The Clairton Plant is subject to federal, state, and local (Allegheny County Health Department (ACHD) air regulations). The ACHD regulates and closely monitors the environmental compliance of the Plant. In addition to periodic monitoring, U. S. Steel continuously monitors many of its sources for environmental performance and compliance at the Plant. These monitors include continuous opacity monitors (COMS), continuous emissions monitors (CEMs), and various continuous parametric monitoring systems throughout the Plant, which read and record thousands of compliance monitoring data values every day. In addition to reviewing the plant's reports and compliance records, ACHD maintains coke oven battery inspectors at the plant five days per week. The certified inspector conducts daily visible emission observations of plant operations.

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In addition to the ACHD inspector, ACHD employs a third-party visible emissions observation contractor that is on-site every day of the year. The third-party contractor implements the USEPA required Method 303 opacity readings (for which U. S. Steel reimburses ACHD) to monitor visible emissions from every battery on a daily basis at the Plant, to determine compliance with Federal Maximum Achievable Control Technology (MACT) Standards pursuant to Method 303 as well as to provide ACHD with data to determine compliance with Article XXI standards.

Method 303 is the USEPA method to determine visible emissions from by-product coke oven batteries.

U. S. Steel focuses on continuously improving environmental performance. The combustion stacks are one of the more significant sources of emissions that environmental performance has been continuously improving at the Clairton plant. Combustion

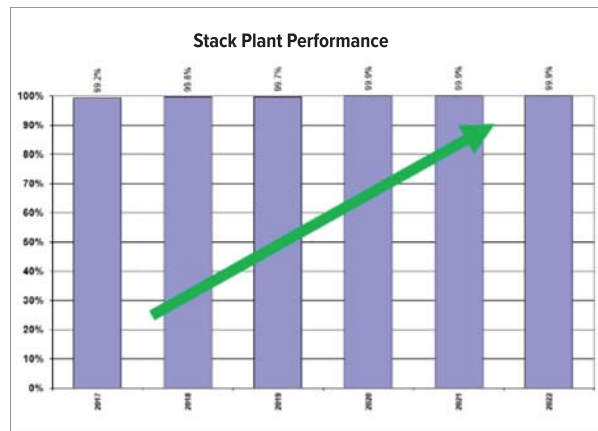


Figure X. 2017 thru 2022 Clairton plant facility-wide combustion stack performance.

products generated by Clairton Plant's batteries during the coke making process are directed to coke battery combustion stacks. Each coke battery combustion stack is equipped with a continuous opacity monitoring system (COMS), which *continuously* measures the degree to which smoke, dust or other particles block light at any given time, or the opacity of the gases exiting the stack. Any combustion issue with the batteries can result in visible emissions from these stacks. According to the Allegheny County Health Department, environmental violations occur anytime this opacity is greater than 20% for more than three minutes aggregated in any given hour, or any instantaneous reading over 60%. Stack performance is calculated daily for all 10 coke batteries in the plant, and *just one three-minute period in an hour could cause a 20% stack violation and put that battery at a 97.9% performance for the day.*

Each hour, on every battery stack, there exists the opportunity for one or both violations to occur. Each year has a potential for 175,200 violations.

In 2022, the Clairton Plant maintained its excellent monthly, quarterly, and annual battery combustion stack environmental performance. Stack compliance at Clairton Plant continued to be 99.9% in 2022, detailing Clairton's continued commitment to environmental stewardship (Figure XX). To reach the level of performance the Clairton Plant team achieved, there were many days in 2022 where all ten batteries recorded a compliance rate of 100%.

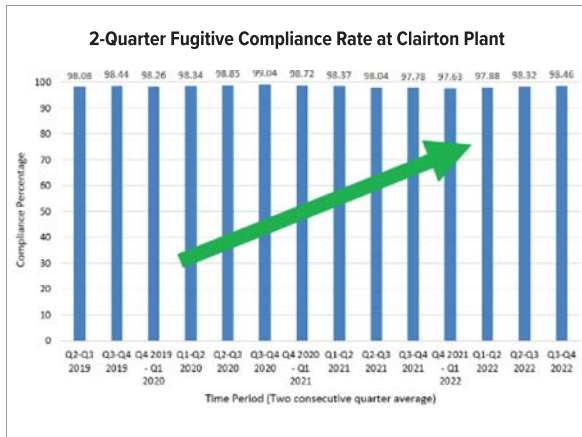


Figure X. Clairton plant two-quarter fugitive compliance performance.

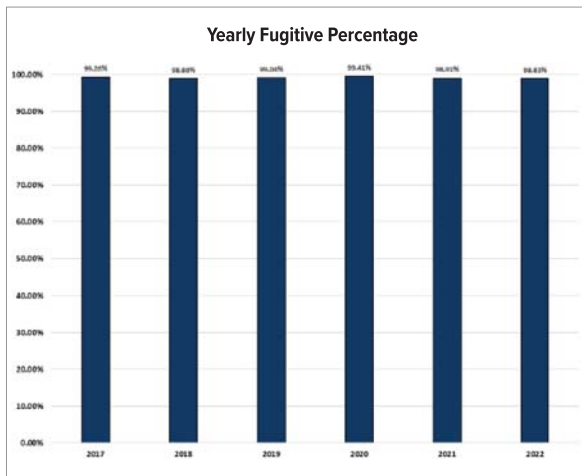


Figure X. Clairton Fugitive Compliance Including All Inspections.

Stack performance is considered a key indicator of the overall environmental performance of the coke batteries both internally and by U. S. Steel’s regulating agency. That is why there is a strong emphasis placed on this compliance rate, and why this record-breaking performance is so important.

In addition to stack performance, two-consecutive quarter fugitive compliance rates at the Clairton Plant are shown in Figure X, detailing Clairton’s continued commitment to environmental stewardship. Figure X includes the results of fugitive visible emissions observations performed by ACHD and a third party ACHD Method 303 contractor in accordance with the June 2019 Settlement Agreement and Order. This figure does not include 3rd party push and travel observations that are conducted daily at the plant in accordance with the Pushing, Quenching, Battery Stacks MACT federal rule. For a more representative picture of Clairton’s fugitive emission compliance see Figure XX below.

A. National Ambient Air Quality Standards (NAAQS)

National Ambient Air Quality Standards (NAAQS) were developed for pollutants considered, in certain amounts, harmful to sensitive populations and the environment. The EPA has set NAAQS for several pollutants, including particulate matter (including PM10, and PM2.5), SO₂, NO₂, ozone, CO, and lead. These standards are developed to be protective of public health for the most sensitive populations. USEPA air monitors operated by the ACHD and located in the Liberty/Clairton area measure the ambient air quality, which accounts for emissions attributable from a variety of background sources, mobile sources, and the Clairton Plant. The Clean Air Act requires the EPA to set NAAQS, and to periodically review the science upon which the NAAQS are based, as well as the NAAQS themselves. Reviewing the NAAQS is a lengthy undertaking and generally takes years for each individual pollutant. While the air quality continues to improve, the EPA has recently lowered the NAAQS further for certain pollutants, including PM2.5, ozone and SO₂.

The EPA continues to lower the NAAQS levels, but U. S. Steel has a history of success. While the air quality improves and the Clairton plant continues to reduce emissions, the NAAQS continue to become more stringent. In response, each time a standard gets lowered, U. S. Steel, with its commitment to environmental progress and innovation of its employees, rises to the challenge. On January 11, 2023, County Executive Rich Fitzgerald noted, “In the last 12 years, fine particulate pollution has decreased 32% at the Liberty Monitor... These are some of the largest decreases in fine particulate pollution anywhere in the country. It’s quite an accomplishment.” This supports the notion that U. S. Steel Clairton has done its fair share to reduce emissions in Allegheny County.

PM₁₀, NO₂, Carbon Monoxide, Ozone and Lead NAAQS

Including 2022 monitor data, Allegheny County and the Liberty/Clairton area has now attained the PM₁₀ NAAQS for 27 consecutive years; the NO₂ NAAQS for 38 years (including unclassifiable/attainment with the 2010 100 ppb NAAQS); the carbon monoxide (CO) standard for 34 consecutive years; the 2015 Ozone (O₃) standard for 6 years; and the lead standard since its latest promulgation in 2008.

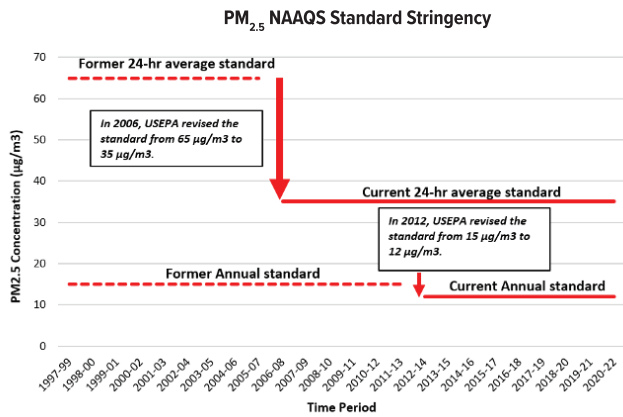


Figure XX. History of PM_{2.5} 24-hour average and annual NAAQS.

PM_{2.5} NAAQS

The following figure depicts how the PM_{2.5} NAAQS has become more stringent over time. In 2006, the 24-hour standard was reduced from 65 µg/m³ to 35 µg/m³. In 2012, the annual standard was reduced from 15 µg/m³ to 12 µg/m³. Attainment of the annual standard had been achieved in 2012 before the limit was reduced in December of 2012. Based on 2022 data, Allegheny County attained both the annual and 24-hour standards for PM_{2.5} for the third consecutive year.

While the Liberty/Clairton monitor has met the PM_{2.5} hourly standard based on recent monitor data, it is currently designated as nonattainment with the 2012 PM_{2.5} annual NAAQS based upon older monitoring data, including periods of time before our major investments. The nonattainment designation was made in 2015. On September 11, 2019, the ACHD Board of Health unanimously approved the PM_{2.5} State Implementation Plan (SIP) for Allegheny County. A SIP is a state plan created for a pollutant non-attainment area (i.e. PM_{2.5}) intended for complying with the Federal Clean Air Act (CAA) by containing new rules to reduce emissions. In this case, ACHD created the PM_{2.5} SIP, and then shared it with the Pennsylvania Department of Environmental Protection (PADEP) for approval. The PM_{2.5} SIP was then submitted to the USEPA. On May 14, 2021, USEPA published a final rule in the Federal Register to fully approve most elements of the PM_{2.5} SIP, and conditionally approve others.

As part of the ACHD’s SIP submittal, U. S. Steel installed new Low-Emission Quench Towers (LEQT) 5A and 7A as the main quench towers for Batteries 13-15 and Batteries 19-20, respectively, replacing the older Quench Towers 5 and 7 that now serve

as emergency/backup quench towers. The new LEQTs were instrumental in demonstrating attainment with the standard for Allegheny County.

2022 preliminary data from the Liberty monitor continues to show attainment for the 3-year (2020–2022) 98th percentile daily average (31 µg/m³ vs. 35 µg/m³) and 3-year annual average (10.9 µg/m³ vs. 12 µg/m³) for the PM_{2.5} NAAQS. The ACHD submitted early certification of data and requested a Clean Data Determination from the USEPA. On March 16, 2022, the USEPA published a final rule including their determination that the Allegheny County, Pennsylvania nonattainment area has clean data for the 2012 annual PM_{2.5} NAAQS. This Clean Data Determination under the EPA’s Clean Data Policy is based upon quality assured, quality-controlled, and certified ambient air quality monitoring data showing that the area has attained the 2012 PM_{2.5} NAAQS based on 2018–2020 data available in EPA’s Air Quality System database. Based on the Clean Data Determination, the EPA also determined that the requirements for Pennsylvania to make submissions to meet certain Clean Air Act requirements related to attainment of the NAAQS for this area are not applicable for as long as the area continues to attain the 2012 annual PM_{2.5} NAAQS. After the clean data determination was made final by the EPA, ACHD submitted a re-designation request for the area to be classified as attainment.

A study analyzing emission source impacts at the Liberty monitor and area traffic data **found that there was a 40% decrease in PM_{2.5} emissions concentrations** when comparing readings from before and after the COVID-19 stay-at-home order in Spring 2020. Over the period reviewed, there was no change in production at the Clairton Plant, while the number of total vehicles on southwestern Pennsylvania roadways in the area fell by 50%. The data review opportunity afforded by these unique circumstances, suggests a direct, significant correlation between the amount of vehicle traffic and Liberty monitor PM_{2.5} concentrations, and further study is required.

Mon Valley Air Pollution Episode Regulation

An air inversion is an atmospheric condition that occurs when a layer of warm air traps a layer of cold air near the ground. Pollutants which are normally dispersed over a wide range become trapped in the layer of cold air. Temperature inversions usually happen in valleys, and the Mon Valley may experience inversions many times throughout the year. On January 2, 2020, ACHD advised the public that it would develop a regulation that would apply to multiple sources in the Mon Valley area to deal with such inversions.

On September 16, 2021, ACHD's regulation, §2106.06 - Mon Valley Air Pollution Episode Rule, became effective. On December 27, 2021, as required by the new rule, U. S. Steel submitted Episode Plans for Clairton, Edgar Thomson, and Irvin Plants. U. S. Steel committed to a nearly 60% reduction of the permitted levels of PM2.5 from its Mon Valley operations during the Warning Phase of an Air Episode. The reductions are approximately 11% to 17% from the four-year average of actual emissions of PM2.5 and 16% to 23% of actual PM10 emissions. ACHD approved U. S. Steel's Plans. U. S. Steel implemented these Plans in 2022 when Watch/Warning Phases were issued.

U. S. Steel Inversion Prediction Tool

U. S. Steel continues to explore potential mitigating actions that can be taken to provide measurable benefits during inversions. In addition, at its own initiative to better understand and predict inversions so we can act proactively, U. S. Steel collaborated with Trinity Consultants to develop an inversion prediction tool. The forecasting system uses a 48-hour forecast from National Oceanic and Atmospheric Administration's (NOAA) High Resolution Rapid Refresh (HRRR) weather model (3 km resolution, cloud resolving, hourly output) as raw data input (48-hour forecast HRRR is updated every 6 hours). HRRR is one of NOAA's cutting-edge numerical weather prediction (NWP) tools, and is the highest-resolution and highest-frequency-updating model that NOAA currently runs on an operational basis. It continually undergoes upgrades and improvements based on the latest research in NWP modeling techniques.

An approximate 1-year model training period was used to develop a custom model translating the raw HRRR weather forecast data into a specific prediction of air quality impacts in the Clairton area.

A wide range of potentially air-quality-significant parameters from the HRRR model output were initially considered in the model development. Extensive experimentation and tuning of the model found that maximum performance was obtained by considering a relatively small set of parameters (wind speed, wind direction, and PBL height), and focusing on the very high sensitivity of the air quality monitor data to those parameters.

The goal of the model's tuning is to accurately predict 24-hour PM2.5 AQI exceedances at the Liberty monitor. Scores >100 are predicted exceedances of the 24-hour PM2.5 100 AQI level. The basics of how the model calculations work, as set based on experimentation and backtesting during the 1 year training period, are as follows:

- PBL height (mixing height), wind direction, and wind speed are the critical parameters from the HRRR forecasts that are used as inputs to our model
- An hourly score is computed for each hour (with higher scores meaning higher expected air pollutant concentrations), and the hourly scores are averaged to give an initial 24-hour air quality score.
- Additional points are added or subtracted to this score by looking at the 24-hour period as a whole (e.g. a large number of hours with extremely low mixing heights results in an increased score, regardless of the average mixing height over the 24-hour period)

Forecast calculations are automatically done every 6 hours when a new 48-hour HRRR forecast is posted by NOAA. These air quality forecasts are automatically emailed out to USS staff once the forecast is complete.

Predicting the Future Through Big Data – U. S. Steel's Digital and Analytics Forecasting Tool

U. S. Steel has developed a fully automated Big Data analytics model to accurately forecast the probability of a potential PM2.5 NAAQS exceedance and provide PM2.5 values four (4) hours in advance at the Liberty Monitor. The model output is based on correlations between Clairton Works operational data, regional and local weather data and local air quality data (Liberty Monitor). The model has the capability to analyze data quickly, predict the potential air quality impact under different operational parameters

and weather conditions. The model allows U. S. Steel to make decisions before and during an Air Pollution Episode Event to minimize the impacts of its operations on the local air quality.

U. S. Steel's Big Data Digital and Analytics Forecasting Tool is a Machine Learning model that is trained on relevant data to identify significant predictive variables and correlations to PM2.5 exceedances. A one (1) year model refinement, training and analyzing period was used to develop and test precision and accuracy of the model. Correlations to PM2.5 exceedances and inversion weather events were discovered and used to intelligently engineer features as inputs into the model. Additionally, PM2.5 regression and classification models were trained through multiple iterations using an eighteen (18) month train, four (4) month test and two (2) month validation process.

To allow U. S. Steel to make informed decisions before and during severe weather inversion events, dashboards were developed to look at current weather and operational values, as well as explain model output, performance, feature importance and prescriptive analytics and their effects on PM2.5 24-hour exceedance values. The Big Data Digital and Analytics Forecasting Tool in tandem with the U. S. Steel Inversion Prediction Tool has allowed U. S. Steel to successfully implement its Air Pollution Episode Mitigation Plans and minimize the impact of plant operations on the local airshed.



Figure X: Big Data Dashboard – Local Wind Direction to the Liberty Monitor



Figure X: Big Data Dashboard Clairton Plant Operation Overview

PM2.5 (µg/m3)			
	Today	24 Hr	Current
Reading	16.1	16.0	3.42
Predicted	17.6	17.4	44.1
Events	2/0	2/0	0/0
Acceptable	High	Severe	
<25	25-35	>35	

Figure XX. Big Data PM2.5 Dashboard Screen

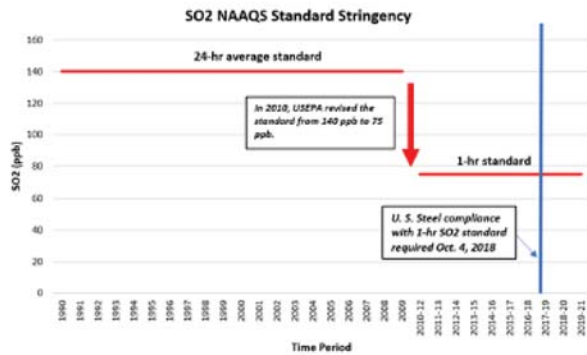


Figure XX: History of SO₂ NAAQS demonstrating change from a 24-hour average to a much lower 1-hour standard.

SO₂

The following figure depicts how the SO₂ NAAQS has become more stringent over time. In 1971, the SO₂ standard was 140 ppb for 24-hour. In 2010, a new 1-hour standard of 75 ppb was promulgated, and the 24-hour standard was revoked. Attainment had been reached for 10 consecutive years prior to the new 2010 primary 1-hour NAAQS. The Liberty area is currently designated in nonattainment based upon pre-2010 ambient air quality data, although the controls currently in place have been shown to demonstrate attainment.

The USEPA approved ACHD’s SO₂ SIP in late April 2020 with the final rule becoming effective on May 26, 2020.

U. S. Steel implemented the following projects and restrictions to reduce SO₂:

- Installation of VCU trays – direct reduction of SO₂ emissions from Coke Oven Gas
- Reroute of Shell Claus Off-gas Treatment (SCOT) Plant Tail gas – eliminates a source of high SO₂ Coke Oven Gas during planned/unplanned SCOT Plant outages
- Required to be and were in compliance with SO₂ emission limits throughout the Mon Valley operations by October 4, 2019

SO₂ data from the Liberty monitor shows attainment of the standard based on the 3-year (2020–2022) 99th percentile (55.7 ppb vs. 75 ppb standard). This value supports a finding that the current SO₂ SIP is working as U. S. Steel’s SIP controls were implemented in late 2018, and the Liberty monitor continues to demonstrate

SO₂ attainment. As had been done for PM_{2.5}, U. S. Steel expects the ACHD to submit a Clean Data Determination (CDD) request to the EPA this year; a critical step for the nonattainment area to be redesignated to attainment. The CDD request from the ACHD to the USEPA seeks review and approval of the Liberty Monitor SO₂ data from 2019–2021 as quality assured, quality-controlled, and certified ambient air quality monitoring data that demonstrates the Allegheny County, Pennsylvania nonattainment area has clean data for the 2010 hourly SO₂ NAAQS and is in attainment with the SO₂ NAAQS.

B. National Emissions Standards For Hazardous Air Pollutants/Maximum Achievable Control Technology (NESHAP/MACT) Requirements

The Federal Clean Air Act (CAA) requires the USEPA to regulate emissions of hazardous air pollutants for listed sources via National Emission Standards for Hazardous Air Pollutants (NESHAP). Hazardous air pollutants are also known as toxic air pollutants or air toxics. They are pollutants that have been found to cause or may cause cancer or other serious health effects or adverse environmental and ecological effects. The USEPA is required to control 187 hazardous air pollutants, or HAPs.

40 CFR Part 63 Subpart L is a NESHAP entitled “National Emission Standards for Coke Oven Batteries” and is applicable to the Clairton Plant. In 1992, the USEPA proposed national emission standards for the control of emissions from new and existing coke oven batteries. This action promulgated the national emission standards and visible emissions observation standards, Method 303, for the determination of visible emissions from by-product and nonrecovery coke oven batteries. U. S. Steel is 100% compliant with the requirements of Subpart L.

40 CFR Part 63 Subpart CCCC is a NESHAP entitled “National Emission Standards for Hazardous Air Pollutants for Coke Ovens: Pushing, Quenching and Battery Stacks” and is applicable to the Clairton Plant. The USEPA issued a final rule to reduce emissions of toxic air pollutants from coke oven batteries in 2003. This rule applies to each new or existing coke oven battery at any coke plant that is considered a major source of toxic air emissions. Major sources are those that emit 10 tons per year or more of a single toxic air pollutant, or 25 tons or more of a combination of toxic air pollutants. The CAA requires the USEPA to identify categories

of industrial sources that emit one or more listed 188 toxic air pollutants, of which coke oven emissions is one. U. S. Steel is 100% compliant with the requirements of Subpart CCCCC.

The CAA requires the USEPA to assess the risk remaining after application of the final air toxics standards. This is known as a residual risk assessment, or Risk and Technology Review. Based on the completion of this risk assessment, including available health information and associated uncertainties, the EPA determines whether the risks from the source sector are acceptable or not and whether the current standards provide an ample margin of safety to protect public health. During the residual risk assessment and as required by the CAA, the EPA will review and revise the maximum achievable control technology (MACT) standards as necessary, considering developments in practices, processes and control technologies since the standards were first issued in 2003.

In August 2015, the USEPA began an Information Collection Request (ICR) for the Risk and Technology Review (RTR) for 40 CFR Part 63 Subpart CCCCC, otherwise known as the Coke MACT, which includes the residual risk assessment from Pushing, Quenching and Battery Stacks. The USEPA continues to work on the risk and technology analysis.

40 CFR Part 61 Subpart L is a NESHAP, not to be confused with Part 63 Subpart L, entitled “National Emission Standard for Benzene Emissions from Coke By-Product Recovery Plants” and is also applicable to the Clairton Plant. These standards are applicable to the equipment associated with the by-products recovery plant (tar decanters, tar storage tanks, light-oil condensers, light-oil sumps, etc.) including pumps, valves, exhausters, pressure relief devices, sampling connection systems, open-ended valves or lines, flanges or other connectors, and control devices.

40 CFR Part 61, Subpart FF for Benzene Waste Operations is also applicable to the Clairton Plant because the Plant operates a coke by-product recovery plant with benzene-containing hazardous waste.

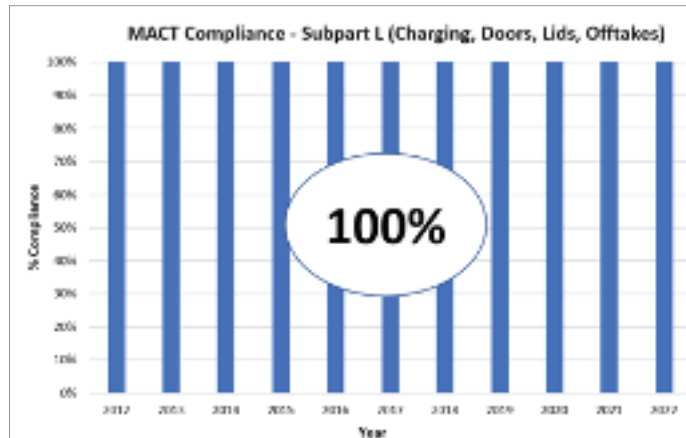


Figure XX: Clairton plant facility-wide Subpart L, National Emission Standards for Coke Oven Batteries, maximum achievable control technology compliance rate from 2012 to 2022.

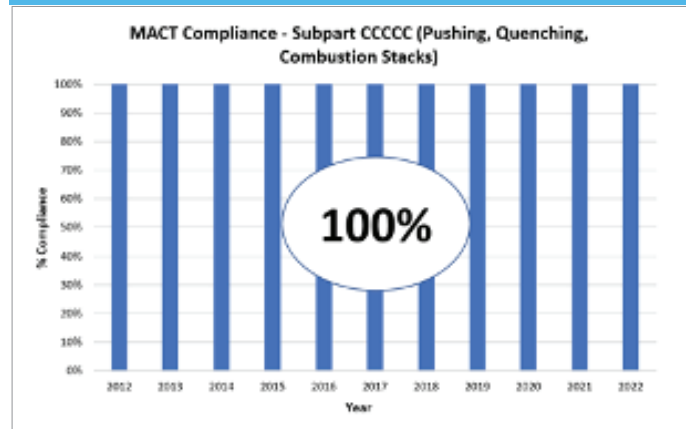


Figure XX: Clairton plant facility-wide Subpart CCCCC, National Emission Standards for Hazardous Air Pollutants for Coke Ovens: Pushing, Quenching and Battery Stacks, maximum achievable control technology compliance rate from 2012 to 2022.

C. Allegheny County Health Department (ACHD) Standards

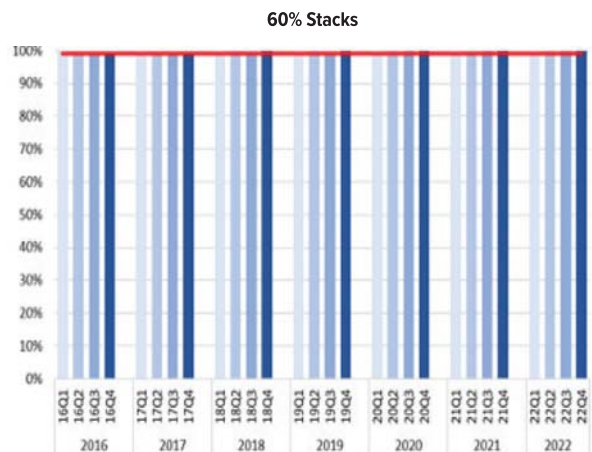
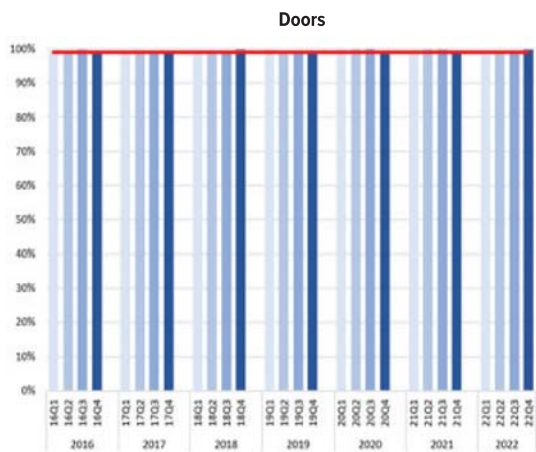
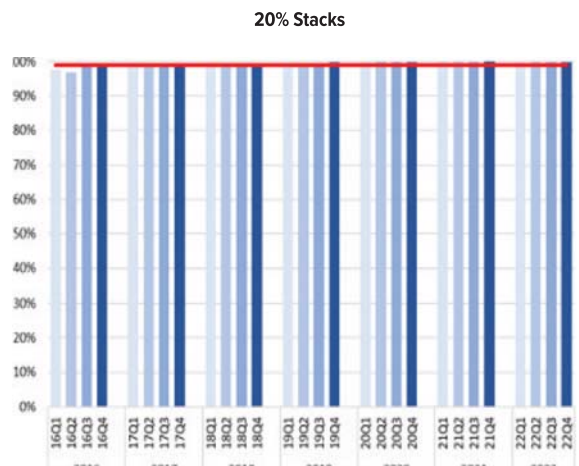
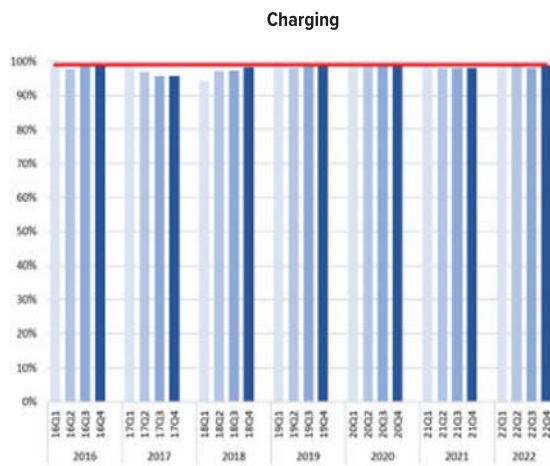
In addition to certain federal regulations, the Clairton Plant is subject to the Allegheny County Health Department requirements, which include performance metrics that, in most instances, are much more stringent than the corresponding federal standards.

The ACHD has recognized that it has promulgated the most stringent air regulations for coke plants in the country. The regulations, found in Article XXI, in most cases, are much more stringent than corresponding USEPA regulations and are enforceable by the ACHD as well as the USEPA as part of the State Implementation Plan. The regulations apply to various coke plant operations, including:

- **Charging** – visible emissions when charging coal into an oven.
- **Doors** – any visible emissions from the door areas during the coking process. In addition, during ACHD inspections, each emission’s opacity is read. Opacity is read because there is a “high opacity door” limit of 30% for C Battery and a limit of 40% for all other Batteries.
- **Charging ports** – visible emissions from the charging ports or charging seals on the battery top.
- **Offtakes** – visible emissions from the offtake piping on the battery top.
- **Pushing** – visible fugitive pushing emissions or emissions from the pushing emission control device outlet.
- **Traveling** – visible emissions from the transport of hot coke from the oven to the quench tower.
- **Combustion stacks** – all 10 Battery stacks have Continuous Opacity Monitors (COMS) used to record opacity. There is a 20% aggregate opacity limit and an instantaneous 60% opacity limit.
- **Soaking** – uncombusted emissions from a standpipe.
- **Quenching** – emissions must be vented through baffles to

control PM and water must be equivalent or better than the water quality standards established for the Monongahela River.

The Clairton Plant was issued a Title V operating permit from the ACHD. Title V permits are required for larger facilities by Title V of the Clean Air Act. The permit is enforceable by the ACHD and the USEPA. The Title V permit is unique to Clairton, is comprehensive, and includes “all applicable requirements” under the Clean Air Act and underlying regulations that apply to the Clairton plant. The permit, renewed and reissued on November 21, 2022, is voluminous, consisting of 325 pages, and includes emissions limits, standards, and work practice requirements, as well as air pollution control equipment, stack testing, monitoring, recordkeeping, and reporting requirements. U. S. Steel is required to provide periodic monitoring reports to the ACHD and the USEPA and certify compliance at least annually, identifying any deviations from any of the applicable requirements.

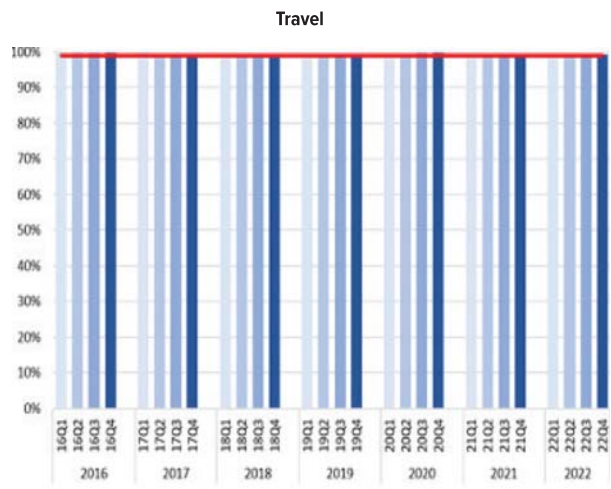
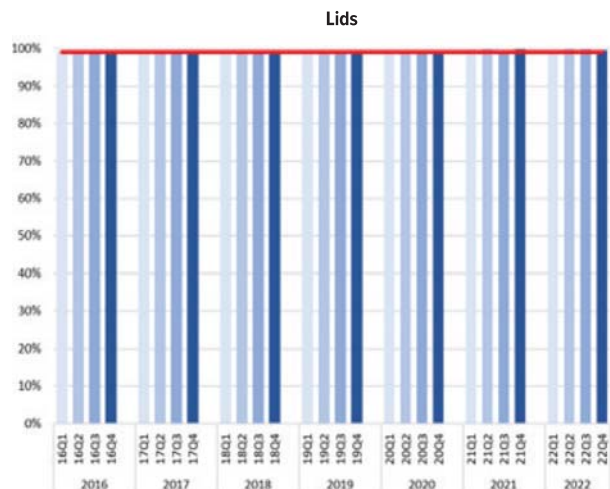
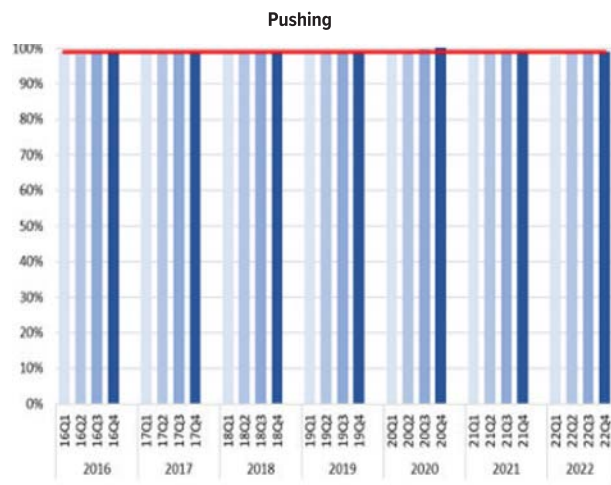
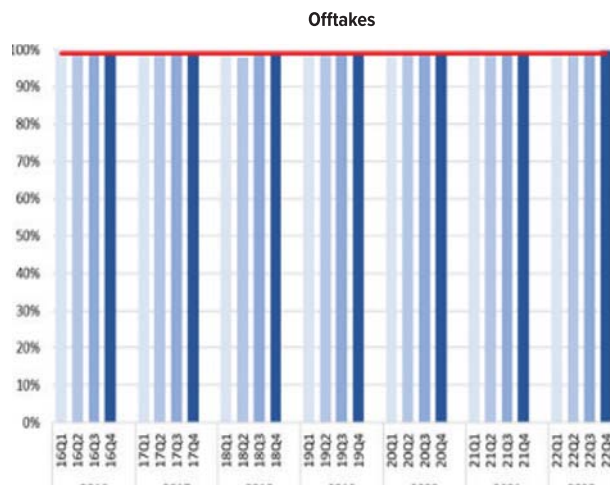


The reissued Title V permit was appealed by U. S. Steel on December 21, 2022. U. S. Steel will work collaboratively with ACHD to resolve the issues that have been appealed. U. S. Steel disagrees with ACHD’s incorporation of new regulatory requirements, including many new emission limits that were not in the prior Title V Operating Permit, nor any underlying installation permits. The Clean Air Act Title V program was not intended to create new emission limits. The Department issued the Title V Permit with substantively different terms and conditions than what was presented in the draft permit, and which could not be reasonably anticipated, without affording U. S. Steel, the regulated community or the public the ability to comment on the substantive changes prior to including them in the final Title V Permit. U. S. Steel is requesting that the unjustified new emission limits and regulatory requirements be removed from the Title V Operating Permit.

U. S. Steel’s Clairton Plant has maintained nearly 100% compliance rate with the Federal Standards and has demonstrated an unprecedented high compliance rate with the ACHD standards that apply to charging emissions, door leaks, battery combustion stack opacity (20% and 60%), offtakes, lids, pushing (cannot exceed 10% at any time), and travel (cannot exceed 10% at any time). U. S. Steel’s compliance with these standards are highlighted below.

D. June 2019 Settlement Agreement and Order #190606 Update

On June 27, 2019, a Settlement Agreement and Order (SAO) was entered into between U. S. Steel and ACHD. U. S. Steel is currently in compliance with all requirements of the SAO.



ENVIRONMENTAL PERFORMANCE – WATER

A. National Pollutant Discharge Elimination System (NPDES Permit) and Performance

The quality of water discharged into the Monongahela River and Peters Creek is governed by a National Pollutant Discharge Elimination System (NPDES) Permit which was issued on September 28, 2012. An application for renewal was submitted in March of 2017, which administratively extends the permit until the PADEP can reissue it. There are eight (8) outfalls at the Clairton Plant that discharge a combination of process and noncontact cooling water. These outfalls are sampled once a week at all of the outfalls associated with the processes. There are also six (6) outfalls associated with emergency overflows, with a sample frequency of twice per discharge event. There are 11 stormwater outfalls which require sampling twice a month. The Clairton Plant has achieved greater than 99% compliance since 2015 with the NPDES permit limits.

Non-contact Cooling Water

Water discharged through Clairton's outfalls include both non-contact cooling water as well as treated process water. Approximately 8,000,000 gallons of non-contact cooling water pass through the outfalls each day. That equates to approximately 2,920,000,000 gallons per year. This water is used for cooling various processes and equipment. Since non-contact cooling water does not physically mix with other process waters, it remains uncontaminated. The only difference is the temperature increase from when it was withdrawn from the Monongahela River. Clairton has strict thermal limits placed at the outfalls that protect aquatic life.

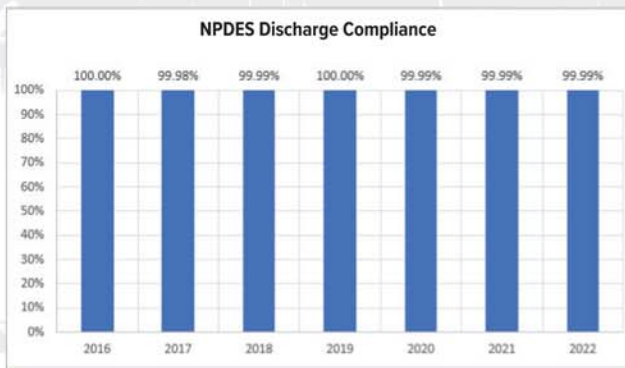


Figure XX: 2016 thru 2022 Clairton Plant NPDES discharge compliance percentages.

Process Water

Approximately 67,000,000 gallons per day of process water is discharged. That equals approximately 24,455,000,000 gallons of process water discharged each year. Clairton's raw material, coal, contains a significant amount of natural moisture that is removed during the process. Additional water is generated by chemical reactions, byproducts recovery, and other operations. The Clairton Plant is continuously upgrading its technology and improving operating practices with the goal of minimizing impacts from plant discharges. All process water is treated prior to discharge. All of the water treatment and chemical additives used in water and wastewater treatment are subject to Pennsylvania Department of Environmental Protection (PADEP) approval before they are used.

The Contaminated Water Treatment Plant (CWTP) utilizes free and fixed ammonia distillation stills to remove ammonia and acid gases and a biological oxidation system to further treat the water. The biological treatment occurs in two aeration basins. This type of treatment utilizes microbiological organisms to consume and eliminate toxic chemicals in the wastewater. The microorganisms utilize these chemicals as sources of food and energy. Solids are then settled out in the clarifiers and the treated water is then discharged to the Monongahela River.



Figure XX. Biological Plant Ammonia Stills and Clarifier.

B. Storm Water Management

All storm water discharges at the Clairton Plant are regulated under their NPDES Permit. The NPDES permit which was issued on September 28, 2012, by the PADEP requires monitoring at 11 storm water only outfalls twice per month during precipitation events. The NPDES Permit also requires that the Clairton Plant maintain a Storm Water Pollution Prevention Plan (SWPPP). The SWPPP identifies potential pollutant sources as well as best management practices (BMP's) to mitigate those sources. A comprehensive site compliance evaluation is done annually in addition to quarterly inspections.

In addition to BMP's, Clairton also has a storm water treatment plant that treats all storm water from the coal storage area prior to discharge to the Monongahela River. Approximately 14,920,000 gallons of storm water is treated each year. The storm water is first collected in two sedimentation basins to allow the majority of solids to drop out. The storm water is then pumped to a secondary treatment system that consists of pH adjustment, polymer addition, and clarification to remove both suspended solids and metals. The treated water is then discharged to the Monongahela River. The solids that are removed during this process (mostly coal fines) are recycled and become part of the metallurgical coal used to make coke at Clairton.

Quench Water

The water used for the quenching of the hot coke comes directly from the Monongahela River. This water is recycled and normally there is no discharge due to the high evaporation rates associated with this process. The evaporated steam is vented through quench towers.



Figure 29. Clairton Plant's Coal Storage Area storm water collection and treatment system include solids and metals removal and pH adjustment prior to discharge to the Monongahela River.



ENVIRONMENTAL PERFORMANCE – RECYCLING

A. Utilization Of Clean Coke Oven Gas

We reduce the amount of waste generated and emissions produced by reusing the by-product gas produced at our coke batteries. This reuse is good for the environment and good for business.

By using coke oven gas generated by our coke batteries, approximately 160 million MMBtu from 2017-2021, we have avoided consuming enough natural gas and other fuels to heat over 1.1 million households each year from 2017 to 2021.

Mon Valley Works as an “Alternative Energy System”

U. S. Steel Mon Valley Works is one of the most energy efficient integrated Iron and Steel facilities in the world. The Mon Valley Works reuses gases from the blast furnaces and coke ovens to support combustion processes at Clairton, Edgar Thomson, and Irvin as well as to generate electricity at the Edgar Thomson and Clairton Plants.

The Mon Valley Works is a certified Alternative Energy System recognized by the Pennsylvania Department of Environmental Protection (PADEP).

The generation of electricity at the Clairton and Edgar Thomson facilities allows the Mon Valley Works to purchase less electricity, thus reducing its carbon footprint. Working with one of our largest electricity suppliers, U. S. Steel has been able to secure Emission Free Energy Certificates to meet all of its purchased power needs through December 2024 for the three Pittsburgh-area Mon Valley facilities (Clairton, Edgar Thomson, and Irvin).

B. Recycling Projects

Clairton generates process residues from the recovery of coal tar and light oil in the by-products recovery plant. Rather than dispose of these residues, Clairton recycles the materials by blending them with the coal feedstock to the coke ovens for recovery in the by-products plant.

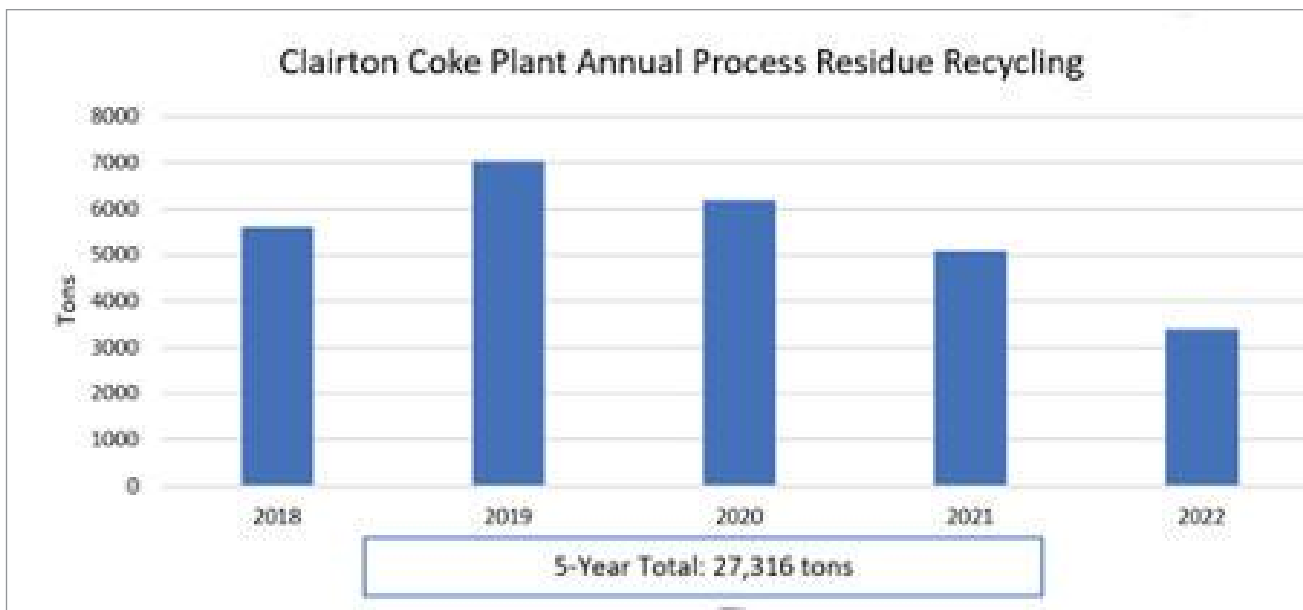


Figure 30. 2018 thru 2022 tons per year of process residue recycling.

COMMUNITY INVOLVEMENT

U. S. Steel's Mon Valley Works – Clairton Plant is joining other local businesses and community groups as a sponsor for South Allegheny School District events held at the district's Gladiator Stadium.

The plant's contribution covers a five-year period and will give our company's brand prominent placement at football games, marching band festivals, commencement and other community events held at the facility.

A. Community Projects

In 2022, U. S. Steel demonstrated its commitment to the communities it operates in by providing thousands of volunteer hours and financial support to a variety of projects and local organizations benefiting education, recreation, and families. Some of these contributions and volunteer efforts are highlighted. .

U. S. Steel Clairton Plant Donation Supports South Allegheny School District

U. S. Steel's Mon Valley Works – Clairton Plant is joining other local businesses and community groups as a sponsor for South Allegheny School District events held at the district's Gladiator Stadium.

The plant's contribution covers a five-year period and will give our company's brand prominent placement at football games, marching band festivals, commencement and other community events held at the facility.



Above: Mike Rhoads (Clairton Plant Manager) presents Dr. Lisa Duvall with a check, South Allegheny's stadium

Clairton Plant ERG Members “SERVE” Meals to those in Need on Easter Sunday

Shepherd’s Heart Fellowship and Veteran’s Home offers local veterans, including those who may be homeless, a variety of assistance. Clairton’s SERVE chapter has developed a partnership with the non-profit to aid their mission in several ways.

Volunteers helped prepare and serve meals to residents. Our volunteers also provided residents with treat bags and gift cards.



Above (in various photos): Mike & Christian Rhoads, Dave & Kim Laing, Dustin Pierce, Brian & Ainsley Pritz



U. S. Steel Clairton Plant's April 2022 Blood Drive a Big Success

Once again, employees at U. S. Steel's Mon Valley Works - Clairton Plant were generous at the plant's quarterly blood drive with Vitalant on April 20.

Overall, 31 donors were registered, and 38 blood products were collected. Since one unit of blood can be used to save up to three lives, our employees' donations can support 114 people in need of blood products. This represented a jump from the team's showing in December 2021 of 26 blood products supporting 78 people.



Above: Don Furko (President - United Steelworkers Local 1557) making his donation

U. S. Steel Clairton Plant Employees Earth Day Effort

At U. S. Steel, we believe every day is Earth Day because our “Environmental Stewardship” S.T.E.E.L. Principle calls on us to operate our business in environmentally responsible ways.

Clairton Plant employees volunteered their time to beautify the plant and surrounding communities. Earth Day efforts included landscaping at the Plant Hospital, trash cleanup, landscaping at the Worker’s Memorial & Maple Gate, tree planting and trash cleanup at Peter’s Creek, trash cleanup, mulching and planting trees at the Montour Trail entrance and Ravensburg Bridge.



Above: Volunteers participate in Earth Day activities at various locations around the Clairton Plant and Community

SERVE ERG Continues Yearly Landscaping of Clairton, PA Veterans Memorial

Mon Valley Works' SERVE Employee Resource Group (ERG) members volunteered their time on May 26 to landscape and beautify the Memorial Hill Veterans Memorial in Clairton, Pa., just in time for Memorial Day. Their work included mulching, leaf blowing, and other clean-up work to prep the park for an annual Memorial Day event on Monday.

Over the last couple of years, Clairton Plant's SERVE chapter has frequently dedicated time to beautifying this memorial, often ahead of the Memorial Day holiday when the park welcomes more visitors.



U. S. Steel Employees Help City of Clairton Honor Local Veterans

Members of the SERVE Employee Resource Group at Mon Valley Works' Clairton Plant joined American Legion Post 75 to help the city of Clairton hang special banners honoring local veterans just ahead of Memorial Day. Thank you to Dustin Pierce, Ernie Reece and Lonnie Grimm for volunteering your time.



Above: (from left to right): Tishie Woodwell, Kevin Stetter, Kendra Carl, Eric Williams, Dave Hacker, Mark Rupnow, Brett Tunno, Chris Hardin, Jonelle Scheetz, Brian Lasko, Megan Bombick



Image 2: A volunteer helping to clean the roadway

U. S. Steel's Legal, Headquarters Environmental and Plant Environmental Participate in Roadway Cleanup

On July 22, a group of 11 U. S. Steel employees from the Legal, Headquarters Environmental, and Plant Environmental organization took time to clean up an approximately 2 mile stretch of Lovedale Road in Lincoln Borough near our Mon Valley Works' Clairton Plant.

Volunteers removed various debris and litter stretching across roadway.

The event was organized by the Legal, Compliance, and Environmental organization's Community Inclusion Committee, which identifies and organizes community engagement projects for interested members of the corporate-based teams.

U. S. Steel's Clairton Plant Hosts Middle School Students for Manufacturing Day Event

60 Clairton-area students learned about steel and its raw materials

On October 7, 2022, in recognition of Manufacturing Day, U. S. Steel's Mon Valley Works' Clairton Plant hosted seventh-grade students and faculty from the Clairton City School District. Plant Manager Mike Rhoads provided a high-level overview of the steel industry and Mon Valley Works to about 60 participants.

The presentation explained to the students how steel is essential to our lives - from the buildings we live in, to the cars we drive and the appliances we use. The students learned the recipe for steel, including the raw materials that are used in the steelmaking process and the coke-making process that takes place at Clairton Plant.

After the presentation, the visitors took a driving tour of the plant, where they were able to see some of the coke-making operations. The students were very enthusiastic about seeing the plant and had many questions for our employees.



Above: Clairton City School District students learn about the importance of domestic manufacturing and enjoy a plant tour, led by Plant Manager, Mike Rhoads

Mon Valley Team Answers the Donation Call from Clairton Plant's SERVE ERG

The photos below show the generous donations made by members of the Mon Valley Works team to continue their support of Shepherd's Heart Fellowship and Veterans Home. The Clairton SERVE chapter thanks everyone for their generosity!

Shepherds Heart Mission provides transitional housing, rehabilitation, counseling, and food for homeless Veterans until they are stable and prepared for independent housing. They also provide a drop-in center for homeless men and women which provides meals, clothing, networking, and services. They provide transportation for Veterans to the VA hospital, medical appointments, government offices and other non-profit agencies. Finally, they provide a food pantry, resource center, emergency fund and cold weather shelter for women.



U. S. Steel & SERVE ERG Host Medal of Honor Recipient for Special Event

On Sept. 14, U. S. Steel's SERVE Employee Resource Group hosted a special event featuring Sergeant Dakota Meyer, a U.S. Marine Corps Veteran, recipient of the Medal of Honor (the U.S. military's highest honor), and New York Times Best-Selling Author of *Into the Fire* and *The Way Forward*.

Sgt. Meyer is the first living Marine to receive the Medal of Honor since 1973 and one of the youngest recipients ever. During the Battle of Ganjgal on Sept. 8, 2009, in Afghanistan, Sgt. Meyer helped save the lives of 13 American and 23 Afghan troops by undertaking five successive rescue missions over six hours.

Sgt. Meyer kicked off his visit by telling a packed conference room at Mon Valley Works' Clairton Plant and many more attending virtually that he was floored when he learned what our employees do and the products our company makes. "It's hard to drive around this facility and not be proud to be an American," he said. "What you do matters."

During his hour-long talk, Sgt. Meyer shared more about his choice to enlist in the Marines, serving our country in multiple tours in the Middle East, his experience in the Battle of Ganjgal, and finding a new purpose in life upon the completion of his military service. In addition, he:

- Stressed how people don't need to wear a uniform of any kind to serve others or their country
- Highlighted his DASH approach (Detoxify – Activate – Support – Hydrate) to both physical fitness and leadership in any situation
- Emphasized every person has the power to make the kinds of change that make other people, other places and the world better.

Together, we're creating workplaces that work for all, helping to deliver our Best for All® strategy, and enabling our company to make our communities stronger.



Above: Sergeant Dakota Meyer, Mon Valley Works and Clairton Plant leadership

U. S. Steel Lays Wreath at Arlington Cemetery's Tomb of the Unknown Soldier

U. S. Steel and our SERVE ERG took time ahead of the Thanksgiving holiday to thank and pay our respects to our nation's fallen heroes at Arlington National Cemetery's Tomb of the Unknown Soldier in Washington, D.C.

We were honored to be granted the opportunity to lay a wreath at this truly sacred spot that symbolizes the bravery, service and sacrifice displayed by the members of the U.S. armed forces. The event served as an opportunity for our company to show our appreciation to the heroes buried in Arlington.

The event also allowed us to involve our SERVE ERG as a sign of our appreciation for the work they are doing to support veterans and those who remain active in the military, as well as their families, inside our company and in the communities where we operate.

The following individuals represented U. S. Steel in the ceremony:

- **Dave Burritt:** President & CEO
- **Ken Jaycox:** Senior Vice President & Chief Commercial Officer and Executive Sponsor of the SERVE ERG
- **Chad Buus:** U.S. Air Force veteran; Senior Area Manager – Central Maintenance & Electrical/Strategy and SERVE Chapter Lead at Minntac
- **Dustin Pierce:** U.S. Army veteran; Shift Manager II and SERVE Chapter Lead at Mon Valley Works' Clairton Plant



Above: Photo 1: U. S. Steel's wreath awaiting placement, Photo 2: Front row (left to right) - Chad Buus and Dustin Pierce. Back row (left to right) - Dave Burritt and Ken Jaycox.

Photo 3: Chad Buus and Dustin Pierce place the wreath on behalf of U. S. Steel employees and our SERVE Employee Resource Group, Photo 4: Dave Burritt (right) and Ken Jaycox (left), Photo 5: Chad Buus (left) and Dustin Pierce (right).

Photo 6: Ken Jaycox (left front), Dave Burritt (right front), Dustin Pierce (back left) and Chad Buus (back right) being escorted away from the Tomb of the Unknown Soldier at the conclusion of the wreath laying ceremony.



Above: Members of Leadership Pittsburgh and Clairton Plant Manager, Mike Rhoads

Mon Valley Works' Clairton Plant Hosts Leadership Pittsburgh Group

The visit was part of the 2022 Leadership Pittsburgh program.

On October 13, 2022, members of the Leadership Pittsburgh XXXIX cohort visited Mon Valley Works' Clairton plant as part of their session focusing on the Pittsburgh regional economy.

Leadership Pittsburgh Inc. (LPI) is a multi-disciplinary leadership identification, enrichment and networking organization in Southwestern Pennsylvania dedicated to developing a robust pipeline of diverse civic leaders to serve the region.

The group met with Clairton's Plant Manager Mike Rhoads, who gave a presentation detailing the significant impact that Clairton and the Mon Valley Works have on the regional economy. Following the presentation, the group toured the plant.

Jenn Beer, the newly appointed CEO of LPI, also joined the participants for the event. She was impressed by U. S. Steel's long history in the region and noted that seeing the plant up close "makes me proud that U. S. Steel has its roots in Pittsburgh!"

Clairton Plant Employees Spread Holiday Cheer to Local Families

In December 2022, employees from U. S. Steel's Clairton Plant bought, wrapped, and delivered gifts to low-income families for the holidays through a partnership with the Southwestern Pennsylvania Human Services, Inc.'s Monessen Family Center's Adopt-A-Child program and Go Time Ministries, Clairton mission. The effort allowed our employees to extend their generosity to children and families in the Clairton, Monessen, Donora, Belle Vernon, and Charleroi areas.

Clairton Plant employees stepped up and provided gifts to nearly 100 children and 40 families. Many employees adopted multiple children and some employees even took on families with five or six members. Their kindness helped the Monessen Family Center and Go Time Ministries, meet the needs of program participants, and improve many peoples' holidays.

Mike Rhoads said that he is "humbled by the outpouring of generosity and the willingness of so many to give back to our neighbors in need. I thank all who participated very much."



Above (left to right): Steve Zelenski, Bridget McElhinney and Mike Rhoads deliver toys to Pastor Brent Furlong at Go Time Ministries, Clairton mission



Above: Mike Rhoads and Bridget McElhinney delivery toys to the Monessen Family Center



Above: Clairton Plant and community volunteers support Operation Santa Claus, A Day of Giving

U. S. Steel Employees Continue to Spread Holiday Cheer to People in Need

U. S. Steel employees continue to spread the holiday cheer this season by helping those in need, the Clairton Plant donated \$2,000 to Lincoln Borough's Operation Santa Claus, A Day of Giving, to provide grocery store gift cards to members of the community.



Above: Mike Rhoads presents a check to Tammy Firda, from Lincoln Council, to support Operation Santa Claus, A Day of Giving



B. Community Advisory Panel (CAP)

In June of 2019, the Clairton Plant established a Community Advisory Panel (CAP). A CAP is commonly defined as a group of representatives from area communities who meet periodically with representatives from a major employer to discuss issues of common interest. The purpose of the CAP is to proactively communicate, to foster a collaborative relationship and to facilitate an understanding of community expectations and concerns. The Clairton CAP consists of key members of the Clairton Plant team along with community members of Clairton, Glassport, Liberty, Lincoln, Jefferson Hills, McKeesport and Port Vue. The quarterly meetings have included tours of the Plant, discussions of current events, Plant compliance, and content/information requested by the communities. In each meeting, the CAP is also educated on the operations of the Clairton Plant. The CAP members, most of which hold local government office, are then better able to answer constituent questions.



Mayor Richard Lattanzi,
City of Clairton

Here in Clairton, and throughout the Mon Valley, there has been so many needs for projects big and small in each of our communities.

We were blessed to start a Community Advisory Panel with U. S. Steel (Clairton Works) and we meet quarterly to exchange information about the plant, mainly Environmental Impacts and Improvements. We have an opportunity to hear from leaders of different departments and how they are working towards a cleaner Mon Valley. We are presented with pictures, graphs, questions, and answers. As a group, we are all concerned about our communities and are not easily won over, however as a group we are satisfied with the progress and the information received whether good or bad, we see results.

The 5 impact communities are blessed to be a part of the Community Benefit Trust, and what a benefit to our local Communities. Before this, it was a struggle to achieve improvements with limited funds and grant opportunities, simply too many projects very little funding! Recently, with The Community Benefit Trust Program in place for us, all the communities are getting the much-needed help to make improvements in our

communities. Honestly, they would not have happened without this infusion of funds and a great working relationship, between the Clairton Plant and the surrounding communities.

Special thank you to U. S. Steel, not only for the financial assistance, but the countless volunteer hours from their staff and local union.

Elaina Skiba, Glassport Borough



We are now halfway through our second year working with the Community Advisory Panel, (CAP). What a positive experience it has been. The education and services provided to the CAP by the USS Clairton Plant have been immeasurable. As an elected official of

Glassport Borough, I am very pleased with the CAP experience. The representatives from the Clairton Plant are not just there to educate us, in turn allowing us to take this knowledge back to our residents, but they offer us many services.

We have been given tours of the plant, instructed on the operations of the plant, the safety measures in place for the employees, the measures taken to make sure the Clairton Plant is in compliance with all of the regulations put in front of them, and many other topics. Even during this challenging time dealing with COVID-19 restrictions, the CAP was still a priority to the plant. We continued to have our meetings whether it was initially virtual or later, in person with social distancing. It is obvious that the Clairton Plant team involved with the CAP is dedicated to continuing to educate its surrounding communities with as much knowledge of the processes and outcomes of the Plant as possible.

Speaking for Glassport, we have benefited from USS Clairton Plant's commitment to continue to be a good neighbor. Whether it be offering a tutoring program, staffed with Plant employees, to our students in the South Allegheny School District, helping Glassport continue to expand our own Safety Committee or providing our Police Dept with disturbance gear, we know that we can rely on the Clairton Plant and its employees to help in our community and school district. I am looking forward to being involved with the CAP for a long time to come.



Tammy Firda, Lincoln Borough

Local government officials always have a huge burden when making decisions with limited funding for what is best for their community. What comes first, the road that needs desperately paved, the dilapidated building that need

demolished or a new municipal vehicle for the police or public works. Wait a minute.....What about recreation? It always takes a back seat but is very needed. The needs are always great, and the funds limited. Even with grants available through other sources it is competitive and most of the time requires a local match. The Community Benefit Trust has made a huge difference for the all over betterment to the five communities that it serves. If you look at the projects that have been accomplished by the communities, it speaks volumes. We are all thankful for the help the Community Benefit Trust has provided through U. S. Steel and look forward to what the future brings.

Lee Lasich, City of Clairton Council

In the past, Clairton residents have suffered from many illnesses, and they always seemed to place the blame on U. S. Steel. Clairton Plant. It's really not the case. Look at the Plant itself. It's undergone many major changes over the past few years and there have been many improvements to the equipment itself, under the plant leadership.

The leaders of the Plant's surrounding municipalities have complained so much about the help that the County didn't give, that U. S. Steel stepped in and helped create a fund in which the five surrounding municipalities participate. Those funds are derived from fines that our County levies against the U. S. Steel, Clairton Plant. Those fines are used by the municipalities to purchase needed vehicle replacements, demolitions, etc., that would go undone without those funds.

Yes, U. S. Steel helps indirectly by the use of those Funds, but it also helps by lending a hand to its neighbors. The employees of U. S. Steel, Clairton Plant are so helpful to the residents of the City, that the residents don't even know it. They go un-thanked many times. The Plant employees help Clairton by the refurbishing of Memorial Hill every year, by installing and removing the Veteran Banners, by the digging of the many, many holes for the Memorial Trees, and any number of things that they are asked.

So, yes, I'm going to say U.S. Steel, Clairton Plant is a good neighbor.

C. Community Benefit Trust

In early 2020, U. S. Steel established a Community Benefit Trust as part of an agreement with the Allegheny County Health Department to resolve the company's appeal of enforcement orders issued by the ACHD against the Company. As part of the settlement, it was of the highest importance for U. S. Steel to represent the voices of the local communities where many of our employees live and work. At our urging, 90% of the disputed penalty and 90% of any future stipulated penalties are placed into the Trust to directly benefit the following localities: Clairton, Liberty, Lincoln, Glassport and Port Vue.

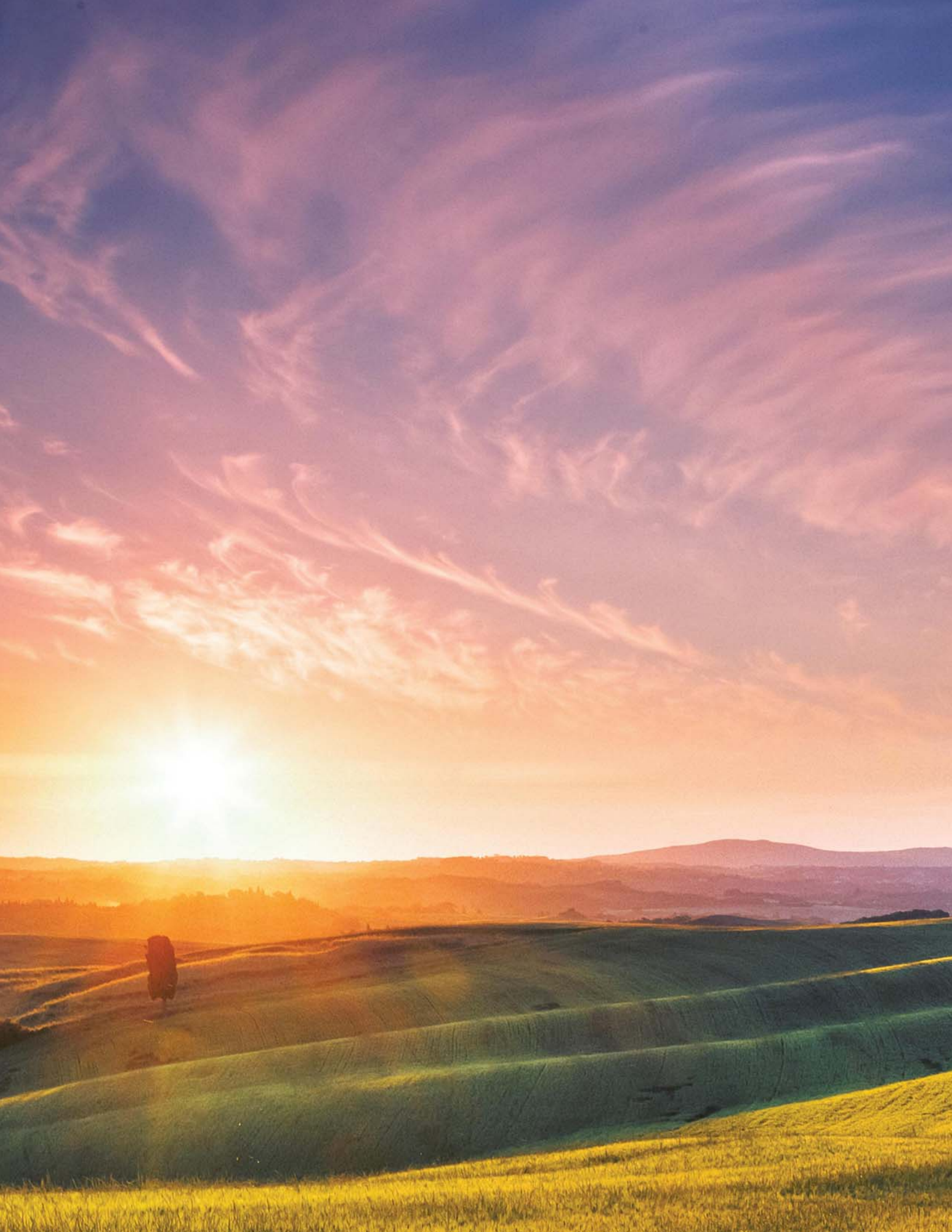
Per the terms of the Trust, distributions from the Trust must benefit the localities or the local environment through supplemental projects, and the projects must be anticipated to improve, protect, or reduce the risk to public health or the environment. Such projects may include providing funding to improve physical community infrastructure (such as the creation or renovation of parks, green spaces, or playground spaces), or fostering the creation or expansion of programs that are aimed at directly improving the well-being of residents, and need not be air quality-related, as long as an environmental and/or public health benefit can be recognized. Any project proposals submitted must demonstrate a reasonable probability that the project will be successful.

The trustee, Smithfield Trust Company, is totally independent from U. S. Steel. The trust instrument requires that the trustee administer investments, issue funds for projects by the Trust Distribution Board (which is a board made up of members representing the five community beneficiaries) and prepare periodic reports and financial documents. U. S. Steel nor the trustee has any role in screening or

approving projects, as that role is the sole responsibility of the Trust Distribution Board.

The Trust Distribution Board has elected a President and Vice President. In 2022, grant applications have been submitted and approved for the communities of Clairton, Glassport, Liberty, Lincoln and Port Vue. Some of the items included in the applications are as follows:

- Upgrades to parks, playgrounds, and recreational facilities
- Sponsoring numerous local youth sports and other youth organizations
- Sponsoring numerous community concerts, festivals, car cruises and other events
- Purchase fire rescue equipment, including SCBA's, masks, oxygen cylinders, dive team equipment and air bags
- Local community scholarship donations
- Adoption of approximately 2 miles of Peters Creek Road for litter control
- Repair of buildings, sidewalks, crosswalks, and roads
- Support local school districts through funding of staff wellness events, school sports, marching bands and PTA's
- Funding for demolition of blighted properties



Commitment to the Environment and Community – Now and in the Future

As shown throughout this 2022 report, U. S. Steel is strongly committed to environmental stewardship and to serve the communities in which we operate

As we move into 2023, we remain committed to:

- Our S.T.E.E.L. principles
- Developing and implementing innovative projects to improve environmental performance
- Providing support to the communities in which we operate
- Assisting the company in achieving the Corporate GHG Reduction Goal to reduce its global greenhouse gas emissions intensity by 20 percent, as measured by the rate of carbon dioxide (CO₂) equivalents emitted per ton of finished steel shipped by 2030, based on 2018 baseline levels.





United States Steel Corporation

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