

*Updated

PADD1 / East Coast

PBF Energy - Delaware City, DE – The 180,000-b/d refinery reported an upset in refining process on Sept. 6 that caused emissions of hazardous materials and flaring, according to a regulatory filing. It is not immediately clear if the issue has any impacts on production.

The refinery also reported an "outage at its carbon monoxide boiler on the fluid coking unit" on July 21, according to a state regulatory filing. The filing showed the outage caused excess emissions of carbon monoxide, sulfur dioxide, hydrogen sulfide, ammonia, hydrogen cyanide and particulate matter. During an April 28 conference call, PBF management said work on the reformer and some secondary units at the refinery was completed in April. Officials previously said that the company will restart some secondary production units soon at the neighboring Paulsboro refinery, which could increase the utilization of the Delaware City refinery, because the two refineries operate as one refining system.

PBF Energy - Paulsboro, NJ – PBF Energy will restart a 50,000-b/d crude unit at the 100,000-b/d refinery that has been idled since 2020 by mid August, company officials said on July 28. The move comes as company officials expressed confidence about availability of feed stock for the unit.

In April, PBF management said its restarted a reformer and a distillate hydrotreater at the facility. At the time, management said the company expected its two East Coast refineries to run at an average 270,000-290,000 b/d for Q2 2022.

Phillips 66 - Linden, NJ – The 272,100-b/d Bayway refinery reported an unspecified equipment malfunction, with around 450 lb. of hydrogen sulfide released for about an hour on June 7, according to a filing to the New Jersey environment regulator. A Phillips 66 spokesman did not comment on the incident. It is not immediately clear if the incident has had any impacts on production.

On May 30, the refinery reported "more smoke output than allowed" related to an incinerator compressor issue, according to an environmental filing. A source told OPIS a terminal at the refinery could be down due to a power outage.

United Refining - Warren, PA – On April 22, a company representative told OPIS that the 70,000-b/d refinery in Warren, Pennsylvania is close to restarting following a one-month shutdown

due to maintenance, with product supplies expected to resume as early as next week. The refinery in northwest Pennsylvania was shut at midnight on March 12, the company said in an email. The specific nature of the refinery outage and any possible production impacts cannot be determined. On Feb. 18, the refinery experienced an equipment failure that released a "natural petroleum vapor." Crews have been working throughout the weekend and the company said it expects the situation resolved by Feb. 20 evening.

US Territory / Virgin Islands

Limetree Bay - St. Croix, USVI – St. Croix Energy has hired SLR International Corp. for environmental due diligence on the shuttered 210,000-b/d refinery and to assist in a restart plan, the new business entity said on Oct. 4. In view are bidding deadlines and extended closing dates determined at recent bankruptcy court hearings in Texas: they allow a stalking horse bid by Oct. 21, followed by an auction date of Oct. 29; parties have until Dec. 3 for a winning bidder to close the sale and Dec. 10 for a backup bidder to close.

Current owners Limetree Bay filed for Chapter 11 bankruptcy on July 12 on the same day that EPA went to court seeking an order to extend a shutdown ordered on May 14 following "multiple major mishaps." Limetree complied with the shutdown order and then suspended plans for restart on June 21 due to financial constraints. Operations at the oil storage terminal continue.

PADD2 / Midwest

BP/Cenovus - Toledo, OH – A fire that broke out on Sept. 20 evening at the 160,000-b/d refinery killed two workers, according to a BP spokeswoman. The fire was later extinguished and the refinery was "safely shut down and remains offline" as of Sept. 21, BP said. Sources said the fire affected a crude unit and a coker, and the refinery is expected to be offline for at least 10-14 days with the Occupational Safety and Health Administration (OSHA) on site.

As previously reported, the refinery began a "major turnaround" in mid April and will down for a large part of the second quarter of the year, Cenovus officials said during an April 27 earnings call.

BP - Whiting, IN – A company spokeswoman said on Sept. 8 the largest crude unit at BP's 440,000 b/d Whiting, Indiana, refinery returned to service around Sept. 2-4, and the facility could resume normal operations "in the coming days," following Aug. 24 electrical

All refinery and processing unit capacity figures are given in barrels per stream day per the EIA Refinery Capacity Report. Material is from the best possible sources, but because of the reticence of many companies to confirm unit outages, it cannot be guaranteed.

fire.

On Aug. 29, a BP spokeswoman said the company is "making significant progress" and working toward "a phased restart of the refinery," she said. Meanwhile, a source close to the refinery's operations told OPIS on Aug. 29 that progress is being made on a boiler affected by the fire and that the boiler should be up in the next day or so. In addition, repowering the affected units should take place within the next 24- 48 hours, the source said. On Aug. 24, a BP spokesman said the refinery experienced an electrical fire that was later extinguished, and affected units were shut down as a precaution.

Cenovus - Lima, OH – A major turnaround at 185,000-b/d refinery during October 20121 was concluding in mid-November, in line with previous company comments that the plant would be impacted by the work in late Q3 and into Q4. OPIS notes that the plant last saw a planned turnaround between late September 2019 and late December of that year. The work accompanied tie-in of a crude flexibility project (which concluded in late November).

Cenovus - Superior, WI – The full cost of the project to rebuild the 50,000-b/d refinery formerly owned by Husky is now estimated at \$950 million, with \$324 million spent so far, with restart of the refinery expected "around the first quarter of 2023," Cenovus said on Jan. 28. Nameplate capacity will be 49,000 b/d, with the capability to process up to 34,000 b/d of heavy oil.

Following acquisition (closed Jan. 1, 2021) the refinery is now owned by Cenovus. Husky, a wholly owned subsidiary of Cenovus, will market its products in the U.S. under the Husky name.

Before suspension of the project in March 2020 due to the COVID-19 pandemic, late 2021 had been targeted for restart. The refinery was shut after an explosion and fire involving the FCC and an asphalt tank on April 26, 2018.

CVR Energy - Coffeyville, KS – The next turnaround for the 136,000-b/d refinery will focus on the coker and one of two crude units, the company said in a Nov. 2 conference call, for 30-40 days most likely in Fall 2023. The refinery saw plantwide maintenance between late February and late April 2020.

CVR has continued engineering and scoping for a renewable diesel conversion that repurposes a hydrotreater, but is likely to wait for assurance that states other than California will adopt low carbon fuel standards before making a final investment decision, CEO Dave Lamp said in the call. CVR has spoken of optionality for the unit to switch between petroleum diesel and RD if warranted. Production of RD at Coffeyville could be as high as 9,800 b/d due to larger size of the unit and hydrogen plant.

CVR Energy - Wynnewood, Ok – The company detailed on Nov. 2 previously disclosed Spring 2022 turnaround plans for the 78,000-b/d refinery in a Q3 earnings conference call. Some 40 days of work

will take place on the FCC, one of two crude units and the alkylation unit. As previously reported, the FCC and alky unit saw several days of unplanned downtime in early May.

The planned maintenance, originally scheduled for Spring 2021, was deferred twice and will now take place alongside the ongoing conversion of the hydrocracker to renewable diesel production. Start-up of RD output (6,000-7,000 b/d) is expected mid-April 2022, according to CEO Dave Lamp. The pre-treater unit on site now has Board approval and is expected to be completed late in Q4 2022, he added.

ExxonMobil - Joliet, IL – Planned multi-unit turnaround at the 275,000-b/d refinery took place in April and May, concluding in late May, market sources told OPIS, confirming reported spring dates. OPIS notes that the refinery's last major turnaround took place around spring of 2019, which included the refinery crude unit, FCC, coker and reformer.

HollyFrontier - El Dorado, KS – May 5 company guidance puts Q2 2021 system throughput in a range of 400,000-420,000 b/d, up from Q1 throughput of 348,000 b/d.

As previously reported, Winter Storm Uri caused unit outages through February at both the 165,000-b/d El Dorado and 166,500-b/d Tulsa refineries. The El Dorado refinery conducted a multi-unit turnaround in Fall 2019.

HollyFrontier - Tulsa, OK – Turnaround at the East Plant of the 166,500-b/d refinery was completed as of the company's Q1 2021 earnings call on May 5, but underwent either unplanned downtime or an extension of the planned work on the FCC between late March and April 21, according to information from state environmental regulators. The FCC began restart on April 20, the report said, experienced malfunction due to compressor malfunction and then went back into operation early on April 21.

As previously reported, planned downtime at the West Plant crude unit was extended in mid-February due to Winter Storm Uri and the smaller East Plant crude unit saw some 65 days of unplanned downtime because of the storm. Q1 system throughput was 348,000 b/d, versus guidance of 350,000-380,000 b/d, and the company's guidance for Q2 is 400,000 to 420,000 b/d.

Marathon Petroleum - Catlettsburg, KY – The 306,000-b/d refinery has been undergoing planned maintenance in at least November 2021, if not also part of October, according to multiple press reports. End dates for the work on one or two of three crude units and one or both FCCs vary, with some estimating around Thanksgiving and others mid-December. The second-largest crude unit was reportedly down for less than a week in the first half of November and the largest crude unit, along with an FCC, reportedly underwent turnaround in Fall 2020.

At a Feb. 2 conference call, the company sees around half of its

Q1 2022 turnaround expenses related to its Gulf Coast region refineries. For Q1 2022, Marathon expects utilization at 92% for Gulf Coast region, 97% for Mid Continent, and 88% at West Coast, while overall FY 2022 turnaround is expected to be "back-half weighted."

Marathon Petroleum - Mandan, ND – The 74,000-b/d refinery will carry out a maintenance turnaround in Q3 2021, company management said in an Aug. 4 earnings conference call without elaborating on its scope or duration.

At a Feb. 2 conference call, the company sees around half of its Q1 2022 turnaround expenses related to its Gulf Coast region refineries. For Q1 2022, Marathon expects utilization at 92% for Gulf Coast region, 97% for Mid Continent, and 88% at West Coast, while overall FY 2022 turnaround is expected to be "back-half weighted."

Marathon Petroleum - Robinson, IL – Planned maintenance at the 266,000-b/d refinery previously disclosed by the company to take place in Q3 2021, appeared by September to be either delayed by a few weeks or taking place on a staggered schedule that would mean some work would conclude in late October or early November, trading sources told OPIS. Gasoline-related units were indicated to have gone down for turnaround in mid-August, while at least coker work (and maybe crude unit maintenance) began in the second half of September.

At a Feb. 2 conference call, the company sees around half of its Q1 2022 turnaround expenses related to its Gulf Coast region refineries. For Q1 2022, Marathon expects utilization at 92% for Gulf Coast region, 97% for Mid Continent, and 88% at West Coast, while overall FY 2022 turnaround is expected to be "back-half weighted."

PBF Energy - Toledo, OH – In a Feb. 10 conference call, PBF management said the 188,000-b/d refinery is running as planned after repairs and scheduled downtime in Q4 2021. Officials of PBF also said on the call that the company expects its only Mid-continent refineries to run at an average 130,000-140,000 b/d for Q1 2022.

A PBF spokesman told OPIS a safety valve in hydrogen service at the refinery relieved, as designed, after a frozen line thawed on Jan. 6. "The hydrogen release caused a loud noise and small fire that was quickly extinguished by refinery personnel," the spokesman said. As previously reported, reports of the Nov. 23 fire at the refinery consistently identify the hydrocracker as having experienced the fire, with little effect seen on other processing units. Duration of the hydrocracker downtime remains uncertain. A PBF spokesperson confirmed that a fire occurred on a "gasoline processing unit" at the refinery at the time.

Phillips 66/Cenovus - Wood River, IL – Turnaround work at the 367,500-b/d refinery began in March and should be complete during the second quarter of 2022, Cenovus executives said during an April 27 earnings call. Officials also said that planned and unplanned work at the refinery impacted Cenovus' overall throughput during

the first quarter of 2022.

Valero Energy - Ardmore, OK – Quarterly reporting on Oct. 21 showed that Q3 2021 throughputs at Valero's three Midcontinent refineries at 465,000 b/d averaged some 2% lower than Q2 but 2% higher than the top end of Q3 guidance. Valero's Q4 guidance for modeling suggested its runs for the region would range between 455,000 b/d and 475,000 b/d, which would register as 98% utilization. The Ardmore plant can process up to 88,000 b/d of crude.

Valero Energy - Memphis, TN – Quarterly reporting on Oct. 21 showed that Q3 2021 throughputs at its three Midcontinent refineries at 465,000 b/d averaged some 2% lower than Q2 but 2% higher than the top end of Q3 guidance. Valero's Q4 guidance for modeling suggested its runs for the region would range between 455,000 b/d and 475,000 b/d, which would register as 98% utilization. The Memphis plant can process up to 185,000 b/d of crude.

PADD3 / Gulf Coast

Calumet - Shreveport, LA – Supply of ULSD from the 60,000-b/d refinery hit a snag around April 5, according to an industry source, due to the unexpected outage of a diesel hydrotreater compressor. Resolution of the issue is seen by April 10 but the timeline is subject to change.

The refinery restarted in March following planned maintenance that began on Feb. 1. As previously reported, restart was about half accomplished by March 3, company executives said in a conference call. While the plant is "highly winterized" and disruption was minimal, Winter Storm Uri's freeze in mid-February halted the turnaround and delayed restart originally planned for end-February. According to RMR history, the reformer and one of two crude units last saw turnaround (two months) in Q4 2019. The other crude unit saw ten days of planned maintenance in November 2018.

Chevron - Pasadena, TX – The 115,700-b/d refinery reported an unspecified "equipment leak" that started Jan. 4, resulting in emissions from a reformer, according to a TCEQ filing. The air emission event lasted for about 12 hours, and it is not immediately clear if the incident has any production impacts.

As of late July, traders were confirming to OPIS reports suggesting that the FCC at the refinery will not be repaired and restarted. As previously reported, the company gave notice of emissions expected from restart of the FCC boiler beginning in early July. That timing suggested a two-week extension of unit downtime. The FCC and boiler were shut on an unplanned basis June 1, with restart was initially estimated to begin June 7 and then downtime duration was extended to June 17. The restart process reportedly began around June 10. The FCC at the refinery last saw planned maintenance in summer 2020, restarting in the first half of August.

***CITGO - Corpus Christi, TX** – The 175,500-b/d refinery reduced rates in multiple units, including the No. 2 FCC, for 11 hours starting Sept. 24 after rains caused an upset, the company said in a TCEQ filing. The Gas Oil Unibon Unit was also impacted, according to the filing, which said unit rates were reduced to stabilize the refinery and stop flaring. Rates were then returned to normal operations.

CITGO - Lake Charles, LA – The company reduced rates at 440,000-b/d refinery following the cyber attack that shut Colonial Pipeline. The company's May 10 statement didn't indicate the size of the cut or the expected duration.

As previously reported, the refinery had been scheduled for four weeks of planned maintenance beginning in February involving 150,000 b/d of capacity, Morgan Stanley researchers said in a report. OPIS notes that the 150,000-b/d crude unit (one of three) last saw scheduled work in the second half of January 2020.

Delek - El Dorado, AR – Turnaround maintenance at the 85,000-b/d refinery – advanced to Q1 from Q2 following the mid-February freeze – concluded in April, company executives said in a May 5 call with equity analysts. Though the work is seen affecting Q2 financials, improving fuel demand has the company expecting the refinery to run at nearly full rates in May and June. Total throughputs averaged 36,432 b/d in Q1.

A fire occurred Feb. 27 which injured six employees. The unit involved, the Penex unit, processes light straight-run naphtha into high-octane gasoline blendstock. The refinery last saw plantwide maintenance between March 11 and April 25 in 2019.

Delek - Big Spring, TX – The 74,000-b/d refinery reported a "process equipment upset during heavy rain" that started on Sept. 15, resulting in sulfur dioxide emission that lasted for 5 hours, according to a TCEQ filing. The filing listed the diesel hydrotreater, gasoil hydrotreater and the light distillate hydrotreater as the process units. It is not immediately clear if the incident had any impacts on production.

On Aug. 18, the refinery also reported "process equipment upset" and emissions on Aug. 18, according to a filing. The filing shows process units include a diesel hydrotreater, gas oil hydrotreater and light distillate hydrotreater. On May 28, the refinery saw a process upset involving the No. 1 sulfur recovery unit, the company reported in a TCEQ filing. The event lasted five hours and resulted in flaring, according to the report. As previously reported, the unit also saw a process upset on March 23.

Delek - Krotz Springs, LA – As of Aug. 31, the operating status of the 83,000-b/d refinery following Hurricane Ida was unclear absent company response to an OPIS query. Media reports on the refinery's status have varied, ranging from full shutdown to reduced rates but documents reviewed by OPIS from an internal DOE report state that all nine New Orleans-Baton Rouge refineries are shut.

As previously reported, the refinery was restarted in late March due to improving margins amid fuel demand still weakened by the COVID-19 pandemic. The plant wrapped up turnaround maintenance in Q1 and plans no major work for the rest of 2021, Delek said on May 4. At the time, the company expected nearly full run rates at its refineries in Q2 due to stronger fuel demand, estimating 91% system utilization. As of Nov. 5, 2020, the refinery was operating the reformer and new alkylate unit but not the crude unit or FCC.

Delek - Tyler, TX – The 76,000-b/d Delek Tyler refinery had "a furnace tube leak and crude-unit failure," according to a letter written by EPA Administrator Michael Regan dated May 28. The EPA said in a statement that day that it has issued an emergency fuel waiver effective until June 6 to "help alleviate fuel shortages" in 34 counties in East Texas whose supply of low volatility gasoline has been impacted by a crude unit.

On April 13, the refinery reported a "transitional operation at the FCC following an equipment malfunction," according to a TCEQ filing. The event lasted for 48 minutes and it cannot be immediately determined if the incident might have any production impacts. The refinery also identified its No. 9 Boiler Stack as the source of the excess emissions and flaring. On Dec. 15, Delek said its refinery will conduct minor maintenance in Q4 2021, which would allow the company to defer the start of the next turnaround until 2023.

ExxonMobil - Baton Rouge, LA – Operations at the 542,000-b/d refinery were impacted due to a loss of steam from a third-party provider, a company spokeswoman told OPIS on May 24. The refinery reported flaring but continued to meet contractual commitments, according to the spokeswoman. She did not provide information about units affected or an estimated time to restore operations.

ExxonMobil - Baytown, TX – The 584,000-b/d refinery said it is "performing planned maintenance activities" that may result in flaring, according to a Aug. 3 post on the company's official Twitter page. On Aug. 2, the refinery said it experience an "operational issue." Company representatives did not respond to OPIS' request for comment, and it is not immediately clear if the incident resulted in any production impacts.

A TCEQ filing on July 29 showed the loss of oxygen to the refinery's FCC No. 2 resulted in emissions that lasted for about 50 minutes. On Feb. 17, reported a "loss of instrument air pressure at an airto-close valve," causing the valve to open and resulting in safe utilization of the flare system, according to a TCEQ filing. ExxonMobil did not specify the unit(s) affected but listed its No. 2 FCC unit as the process unit in the filing. The company said that valve's instrument air line was repaired and the valve was closed, and its fence line monitoring indicates no adverse environmental impact.

ExxonMobil - Beaumont, TX – The 384,400-b/d refinery on July

13 reported a sudden equipment failure involving the FCC that led to flaring, the company said in a TCEQ report. The report said the failure caused the CO boiler to trip. Production rates were decreased to minimize emissions while the problem was addressed, according to the filing.

Flint Hills Resources - Corpus Christi, TX – On Aug. 15, the 350,000-b/d refinery said a "power blink" resulted in the "unplanned shutdown of multiple units at Flint Hills Resources Corpus Christi West refinery," according to a TCEQ filing. A company spokesman did not return a call for comment. It is not immediately clear if the incident has any production impacts.

On Aug. 6, the refinery experienced a power outage caused by a lightning strike that shut down a coker unit wet gas compressor located at its West refinery, according to filing. Flaring lasted for nearly 1.5 hours, the filing showed. On March 28, the refinery said it initiated a safe shutdown of a "2nd stage charger heater" in a hydrocracker unit located at the West Refinery after discovered a leak there, according to a TCEQ filing. Additionally, it said while decommissioning that heater at the hydrocracker to repair the leak, the capacity of the flare gas recovery unit was exceeded, resulting in flaring. As previously reported, the refinery reported flaring following the March 13 unplanned shutdown of the continuous catalytic reforming unit at its west refinery, the company said in a filing. During the event, there were also leaks in a naphtha hydrotreater recycle compressor and the NHT bottoms/feed exchanger in the CCR unit, according to the report. The cause of the event is currently under investigation, the report said.

HollyFrontier - Artesia, NM – The 124,000-b/d refinery began maintenance turnaround on units including the FCC, at least one of two crude units, the alkylation unit and the hydrocracker in late September or early October 2021, in line with previous guidance, and began restarting units in mid-November. The last turnaround for the New Mexico refinery took place in Q1 2017. As previously reported, renewables co-location plans include construction of a new, 125-million-gal/year renewable diesel unit (to open Q1 2022) as well as the construction of a feedstock pretreatment plant.

LyondellBasell - Houston, TX – The 289,000-b/d refinery saw a June 14 fire, the company reported in an environmental filing. The report did not specify the unit involved, but reports indicated the fire occurred in a coker heater unit and would result in reduced crude runs while repairs were conducted.

As previously reported, the refinery saw process upsets on both May 23 and May 18. On May 2, loss of gas processing capacity in a compressor led to a fluid catalytic cracking unit being taken offline.

The company announced April 21 it intended to shut the refinery by the end of 2023. However, company CEO Kenneth Lane on April 29 said the company will also continue to consider potential transactions and alternatives for the site. The company had been

seeking a buyer for the site since September.

Marathon Petroleum - El Paso, TX – A Jan. 20 leak in an alky cooling tower exchanger at the 138,000-b/d refinery led to the equipment being blocked in, the company said in a TCEQ report. The report didn't indicate other units that might have been impacted or if production was disrupted.

As previously reported, an external power interruption on Nov. 13 disrupted operations at the refinery, shutting down process units and spurring flaring, according to an emissions report filed with TCEQ. The units weren't identified and the filing didn't include any downtime duration of restart dates. The El Paso refinery underwent planned maintenance in Q4 2020.

At a Feb. 2 conference call, the company sees around half of its Q1 2022 turnaround expenses related to its Gulf Coast region refineries. For Q1 2022, Marathon expects utilization at 92% for Gulf Coast region, 97% for Mid Continent, and 88% at West Coast, while overall FY 2022 turnaround is expected to be "back-half weighted."

Marathon Petroleum - Galveston Bay, TX – On Aug. 23, the 625,000-b/d refinery said it "experienced steam loss causing multiple unit issues across the refinery," the company said in a TCEQ report. The company "brought effected units to safe state and resumed normal operations," the filing showed. A Marathon Petroleum spokesman said the company did not comment on refinery operations. It is not immediately clear if the incident affected production or other operations.

On Aug. 7, equipment issues resulted in a loss of feed to an FCC unit at the refinery, resulting in a process upset and flaring.

As previously reported, an ultracracker unit experienced a shutdown on Aug. 3, when a valve closed unexpectedly, the company said. The incident triggered flaring that lasted for around 2 hours. A TCEQ filing on July 21 showed the refinery reported intermittent issues with a sulfur recovery unit, with flaring lasting for around 15 hours.

Marathon Petroleum - Garyville, LA – On Feb. 21, the 608,000-b/d Garyville refinery has extinguished a fire that broke out earlier in the day, with air monitoring devices having detected no hazardous emissions, a Marathon spokesman said. Media reports said the incident took place near a hydrocracker. It is not immediately clear if the fire might have any production impacts.

On Aug. 31, 2021, the company had disclosed the refinery sustained minor damage from Hurricane Ida and was using generators as it assessed a timeline to resume operations. The plant was shut on a precautionary basis Aug. 27-29. At a Feb. 2 conference call, the company sees around half of its Q1 2022 turnaround expenses related to its Gulf Coast region refineries. For Q1 2022, Marathon expects utilization at 92% for Gulf Coast region, 97% for Mid Continent, and 88% at West Coast, while overall FY 2022

turnaround is expected to be "back-half weighted."

Motiva - Port Arthur, TX – The 639,700-b/d refinery will begin startup activities of its FCC unit in response to an unplanned shutdown, according to an Aug. 30 TCEQ filing. Flaring is expected to take place for 48 hours between Aug. 31 and Sept. 2. It is not immediately clear if the event has any impact on production. On July 14, the refinery saw flaring related to a process incident involving a variety of units, the company reported in a TCEQ filing. The nearly nine-hour event involved flares associated with the crude reforming unit, FCC, delayed coking unit and hydrocracking unit, according to the filing. As previously reported, a July 5 process incident resulted in flaring which lasted for nearly 11 hours. On Jun 20, the refinery began restarting a FCC unit following an unplanned shutdown.

PBF Energy - Chalmette, LA – The 197,000-b/d refinery is scheduled for turnaround work during the fourth quarter of 2022, company officials said July 28. The company did not disclose the nature of the work or units impacted.

During an April 28 conference call, PBF management said the refinery completed a major turnaround of the reformer among other activities during Q1. The company also expects throughput at its only Gulf Coast refinery to be 180,000 b/d to 190,000 b/d for Q2 2022. Management also confirmed a 20,000-b/d renewable diesel facility on site, repurposing certain idled assets including a hydrocracker, should begin production in the first half of 2023.

At a Feb. 10 conference call, the company said the refinery was in the process of wrapping up a turnaround on its aromatics and reforming units.

Phillips 66/Cenovus - Borger, TX – The 157,000-b/d refinery reported flaring in "Area E" that lasted for about 3 hours on July 28, as refinery personnel made operational adjustments to minimize emissions, according to a TCEQ filing. The refinery did not specify an affected unit(s) and it is not immediately clear if the incident resulted in any production impacts.

The refinery a process upset on June 26, with emissions lasting for about 5 hours from its Unit 43 sulfur recovering unit (SRU) located in Area C, according to a TCEQ filing. The filing didn't specify if the event impacted production. According to a previous TCEQ filing, the refinery was undergoing planned maintenance involving the Unit 40 FCC electrostatic precipitators from May 31 through June 2. As previously reported, Cenovus executives said in April turnaround work at the refinery began in March and should be complete during the second quarter of 2022. On April 27, Phillips 66 reported an emissions event involving multiple units at the refinery, including the SRU, hydrogen plant, coker heater and vacuum unit heater, according to a TCEQ filing.

Phillips 66 - Belle Chasse, LA – The 269,140-b/d Alliance refinery

will not be returned to operation, the company said Nov. 8, but will instead be converted into a terminal facility in 2022.

The plant was shut down ahead of Hurricane Ida's Aug. 29 landfall and sustained "significant impacts" (including flooding from a broken levee). Previously the refinery was expected to be down at least until the end of 2021 while Phillips assessed future strategic options for it. The scenario was similar to one in 2020 following impacts from Hurricane Sally which shut the refinery on Sept. 13 of that year. Phillips carried out maintenance through Q4 2020, then began restarting units in January.

Phillips 66 - Sweeny, TX – On Sept. 14, Phillips 66 said "multiple refinery units experienced process upsets that required safe utilization of the flare system" at the 278,900-b/d Sweeny refinery due to a "third party power failure," according to a TCEQ filing. Power was restored as quickly as possible, and operations personnel are stabilizing units. It is not immediately clear if the incident has affected refinery production.

On June 27, the refinery also experienced a process upset and maintenance/startup activities that led to flaring, the company reported in a TCEQ filing. Units impacted by the incident included the Unit 3 Regenerator, Unit 4 Gas Concentration Plant and the Coker flare, according to the filing.

Placid Refining - Port Allen, LA – The 82,500-b/d Baton Rouge area refinery, upon getting power back in early September and a loan of 300,000 bbl of SPR crude, was restarting processing units, according to DOE and media reports. The plant was shut on Aug. 28 ahead of Hurricane Ida landfall on Aug. 29 near Port Fourchon.

Pemex - Deer Park, TX – The 340,000-b/d refinery reported a "compressor trip" on Sept. 17 that sent gas to the "West Property Flare," according to a TCEQ filing. The filing listed distilling as a process unit, the filing shows, and the compressor was restarted in about 2 hours. It is not immediately clear if the work had any production impacts.

On Aug. 26, the refinery said it is "performing work activities that may cause flaring," according to a CAER filing. The filing did not specify the impacted units. As previously reported, the refinery also reported a day and a half of flaring starting July 24 due to work activities. In addition, the refinery saw an onsite leak July 2 with work to correct the situation lasting about two days, according to a series of CAER filings. On July 1 the company had warned that work activities at the site might cause flaring.

Shell - Norco, LA – On Jan. 3, the 250,000-b/d refinery reported "a unit upset" as well as "elevated flaring and smoking until the unit is back online," according to the refinery's Facebook update. The company said it will monitor air conditions throughout the restart of the unspecified unit. It is not immediately clear about the duration and any production impacts of the incident.

The refinery– shut ahead of Hurricane Ida on Aug. 29 – is preparing to begin a month of restart to begin mid-October, the company said Oct. 4. Maintenance and repairs to storm damage are ongoing following the restoration of power and utilities, Shell said. Local utility Entergy had estimated Sept. 29 for restoration of power to St. Charles Parish where the refinery is located. As previously reported, the FCC was shut down as of at least Aug. 6 due to a catalyst leak, according to market sources. OPIS notes that FCC was shut for nearly two weeks in April.

Starlight Relativity - San Antonio, TX – The 21,000-b/d refinery in San Antonio said its compressor and isomerate units “tripped” on March 25, sending gas to the flare, according to a TCEQ filing. The company said it “reset compressor and isomerate units,” without providing specific details. It cannot be immediately determined if the incident has any production impacts.

Total - Port Arthur, TX – A wet gas compressor at the 245,000-b/d refinery's delayed coker unit "tripped" during a heavy rainstorm on June 4, resulting in flaring at the South, North and East flares, according to a TCEQ filing. It is not immediately clear about the incident's exact production impacts. On Feb. 17, the refinery said it discovered a leak on the naphtha feed line to the Naphtha Hydrotreating Unit, which triggered flaring for about 2.5 hours. The naphtha feed line was isolated and a temporary clamp was installed, Total said in the filing. On Feb. 11, the refinery experienced a process upset at its sulfur recovery unit (SRU) No. 5 that resulting in a unit trip, and sulfur dioxide are to be emitted from SRU No. 4 and SRU No. 5 incinerators. The refinery "reduced rates" at several acid gas producing units, the filings showed.

Valero Energy - Corpus Christi, TX – The July 3 controlled shutdown of a compressor in the East Plant Complex 7 coker led to nearly eight hours of flaring at the 297,000-b/d refinery, according to a TCEQ filing. The shutdown was due to maintenance activities and led to reduced rates in the affected units, according to the filing.

As previously reported, the refinery saw flaring related to an unexpected outage of a third-party gas plant on June 19. The event lasted for about six hours. On May 17, the refinery reported that protective safety shutdown sequences were automatically initiated in its West Plant due to loss of electric power. The incident included flaring.

Valero Energy - Houston, TX – The 210,000-b/d refinery reported "maintenance activities" and flaring at its refinery, according to a message posted on CAER Online website on Aug. 30. The refinery said "no community impacts are anticipated." It is not immediately clear if the incident has affected production. On Feb. 7, the refinery said an unanticipated loss of power related to a third-party supplier issue that triggered flaring, according to a TCEQ filing. On Feb. 3, the refinery also reported flaring due to operational conditions, according to a community environmental notice. The

notice did not indicate which units were affected.

Valero Energy - Meraux, LA – The company reported an April 22 fire in a ROSE unit at the 1.649 million-b/d refinery. The unit allows the plant to convert a higher proportion of its feedstock into lighter, high-grade products such as gasoline and diesel. The cause of the fire was under investigation, and the length and scope of any impact on production was unclear.

Valero Energy - Norco, LA – Quarterly reporting on Oct. 21 showed Valero Gulf Coast Q3 throughput at 1.649 million b/d, 4.7% lower than Q2 but even with the upper end of Q3 guidance. Valero's Q4 guidance for modeling for its Gulf Coast plants is 1.67 million to 1.72 million b/d. The expansion of renewable diesel production at the co-located Diamond Green Diesel plant – by 400 million gal/year – concluded ahead of schedule in Q3 and began the process of starting up on Oct. 18, according to company officials.

As of Sept. 14, post-Hurricane Ida restart of the 220,000-b/d St. Charles refinery was underway. The plant was shut on a precautionary basis ahead of Hurricane Ida landfall on Aug. 29. Utility Entergy had estimated Sept. 29 for restoration of power to St. Charles Parish where the refinery is located.

Valero Energy - Port Arthur, TX – The 415,000-b/d refinery saw a process upset and flaring that lasted for three hours on July 27, according to a TCEQ filing. As previously reported, a process unit upset on July 17 led to six hours of flaring, the company reported.

Valero Energy - Sunray, TX – On June 10, the 200,000-b/d McKee refinery reported flaring that lasted for nearly 24 hours due to a "protective" protocol related to a vapor recovery compressor in Complex 2, according to a TCEQ filing. It is not immediately clear if the incident had any impact on production. On June 7, the refinery saw flaring from the FCC following an issue with the gas vapor recovery unit. The event lasted 13 hours. On Feb. 20, a light ends compressor at Complex 2 experienced an unanticipated performance disruption, triggering flaring. A previous filing showed scheduled maintenance took place at Complex 1 between Jan. 18 and Jan. 21.

Valero Energy - Texas City, TX – A problem with a compressor in complex III at the the 231,000-b/d refinery led to flaring on March 15, the company reported in a TCEQ filing. The report didn't indicate an impact on production.

As previously reported, on Feb. 4 refinery operators said a third-party power supplier failure resulted in loss of power to the plant resulting in “multiple process upsets” and widespread flaring at the facility, according to a TCEQ filing. Problems with a Tail Gas Incinerator led to an emissions event Jan. 3, according to a TCEQ filing.

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Valero Energy - Three Rivers, TX – The 91,000-b/d refinery discovered a “packing leak” on a valve at a Light Ends Unit on March 29, triggering flaring that lasted for about 6 hours at the plant's Complex 1, according to a TCEQ filing. Refinery personnel took steps to shut down the unit “as expeditiously as possible,” but it cannot be immediately determined if the incident might have any production impacts.

PADD4 / Rockies

Calumet - Great Falls, MT – Plans remain in place for the 27,000-b/d refinery to see planned maintenance in Spring 2022, the company said in a Nov. 5 earnings conference call. The April 2022 work will be plantwide and coincide with the conclusion of a partial conversion to renewable diesel production (15,000 b/d RD, 12,000 b/d for petroleum). The project received key permits sooner than expected, CEO Steve Mawer said, adding that discussions on entering into a joint venture for the project “are well advanced.”

As previously reported, the refinery saw a “mini outage” for the FCC in Fall 2021. Three weeks of maintenance were carried out beginning April 5, 2021 (units not identified), and the last plantwide turnaround was 45 days ending in late March 2018. The FCC and alkylation unit last saw planned maintenance in September 2018.

ExxonMobil - Billings, MT – The 69,500-b/d refinery has resumed normal operations after repairing damage from a March 26 explosion and fire, a company spokeswoman said June 10.

HollyFrontier - Cheyenne, WY – Work on the renewable diesel unit at the 52,000-b/d refinery is mechanically complete, with renewable fuel sales from the facility expected to start in Q1 2022, the company said in a Dec. 14 filing with the U.S. Securities and Exchange Commission. HollyFrontier announced in June 2020 it would convert the refinery to renewable diesel output and also indicated it would construct a pre-treatment unit at its Artesia refinery. That project is expected to be complete in Q2 2022.

Sinclair Oil Corp. - Casper, WY – HollyFrontier has held to expectations of a mid-2022 close of its acquisition of Sinclair's two refineries (announced in August 2021), according to comments made in a November 2021 conference call. As previously reported, the 30,000-b/d Casper refinery was in turnaround during August 2021 until mid-September, according to an industry source. The refinery saw plantwide maintenance during an overhaul of the refinery in May 2016 which included the replacement of fuel-oil-fired steam boilers (powering the crude unit and other plant operations) with boilers that use natural gas.

Suncor - Commerce City, CO – Early Aug. 8, Suncor said it is shutting down part of its 111,700-b/d refinery in Commerce City,

Colorado, due to an “equipment malfunction.” A company spokeswoman told OPIS later that day that “refinery operations are back to normal.” It is not immediately clear about the exact impact on production.

As previously reported, the refinery said it is in the process of safely taking units out of service due to an “equipment malfunction,” Suncor said in its website on March 17. It cannot be determined about the duration of the outage and if the incident has any production impacts.

PADD5 / West Coast

BP - Blaine, WA – The 251,000-b/d Cherry Point refinery has undergone planned maintenance between Jan. 21 and Jan. 24, according to a regulatory filing. “Process unit maintenance requires scheduled equipment shutdowns,” according to the filing, without further elaboration. As previously reported, the refinery also reported planned works between Dec. 3 and Dec. 12, 2021. The refinery plans to double its renewable diesel production capacity and improve its hydrocracker with work seen beginning in Q4 2021 and concluding in 2023, the company said Oct. 4. RD output (reducing the refinery's CO2 emissions) will increase to 2.6 million bbl/year (7,123 b/d) in 2022 and the improved hydrocracker will reduce the amount of hydrogen used by the unit, reducing CO2 emissions. Work on the hydrocracker and cooling tower will conclude in 2023.

Chevron - El Segundo, CA – Planned flaring is expected to take place at the 290,500-b/d Chevron El Segundo refinery between Aug. 16-19 due to “start-up/shut down,” according to a regulatory filing with the South Coast Air Quality Management District (SCAQMD). It is not immediately clear if the incident had any impacts on production. OPIS previously reported unplanned flaring took place as recently as Aug. 11 due to a “mechanical/electrical malfunction.”

On Aug. 6, the refinery also reported “a mechanical issue at one of its operating units,” according to a Chevron statement, resulting in the intermittent use of the facility's safety flares that could be visible to the public. The company said it remedied the issue and notified the cities of El Segundo and Manhattan Beach. A South Coast AQMD filing showed unplanned flaring the refinery took place on Aug. 6 afternoon for about 12 minutes. Sources told OPIS the issue might be related to a hydrocracker. On June 27, the refinery saw unplanned flaring following a mechanical/electrical malfunction, the company reported in an environmental filing. A second filing indicated a second round of flaring about nine hours later due to start-up/shutdown procedures.

Chevron - Richmond, CA – “Significant flaring” was reported on Sept. 2 at Chevron's 257,000-b/d Richmond refinery near the Bay Area with the cause reported as “mechanical,” according to a filing with the California Emergency Management Agency. It cannot be

immediately determined if the events may have any impact on production. On June 7, a CalEMA filing showed flaring at the refinery. On March 21, the refinery also reported flaring, the same day a local United Steelworkers union chapter began a strike after failed contract negotiations, OPIS reported.

HollyFrontier - Anacortes, WA – Extreme cold weather caused a Dec. 26 upset at the 149,000-b/d, according to regulatory filings from the Northwest Clean Air Agency. The filing did not identify units affected.

As previously reported, a Nov. 9 leak in a vacuum pipe still at the refinery led to the unit being shut down, according to a notice from the Northwest Clean Air Agency. The Puget Sound refinery was acquired by HollyFrontier in a deal that closed Nov. 1. Shell is managing production and fuel offtake until year-end.

The next scheduled turnaround for the refinery is in 2024. In mid-May, Shell wrapped up maintenance that began April 16, filings showed.

Marathon Petroleum - Anacortes, WA – The 120,000-b/d refinery saw flaring between Dec. 30 and Jan. 3 due to startups following unit shutdowns caused by freezing weather around Christmas, the company said in a filing with the Northwest Clean Air Agency. The company did not identify the affected units or detail the impact on production.

As previously reported, the company said in another environmental filing that the refinery was “processing crude but at a lower rate” between Nov. 18 and Nov. 19, due to corrosion on the inlet of the flare gas recovery compressors. The filing also showed that compressors were back in service on Nov. 19.

At a Feb. 2 conference call, the company sees around half of its Q1 2022 turnaround expenses related to its Gulf Coast region refineries. For Q1 2022, Marathon expects utilization at 92% for Gulf Coast region, 97% for Mid Continent, and 88% at West Coast, while overall FY 2022 turnaround is expected to be “back-half weighted.”

Marathon Petroleum - Los Angeles, CA – Planned flaring was estimated to take place at Marathon's 382,000-b/d Los Angeles refinery between Sept. 14-22 for “start-up/shut down” activity, according to a filing with the Flare Event Notification System on Sept. 20. It is not immediately clear if the event has any impact on production.

As previously reported, planned flaring would take place at the Carson section of the refinery Sept. 3-9 for “start-up/shut down,” according to a SCAQMD filing on Sept. 2. On May 14, a power outage impacted the hydrocracker at the Wilmington section of refinery and led to flaring, market sources told OPIS. An environmental filing by the company confirmed flaring at the facility.

Marathon Petroleum - Martinez, CA – On Dec. 16, 2021, the refinery reported a “flange leak from a hydro carbon unit” that

resulted in flaring, a day after the refinery reported an unspecified unit startup.

In May 2021, MPC's board has approved a renewable diesel (RD) project at the Martinez facility, which will transition the 166,000-b/d oil refinery to a 17,000 b/d RD production facility in the second half of 2022. Following start-up of a feedstock pre-treatment plant in 2023, RD production is expected to increase to a total of 48,000 b/d by the end of 2023. The refinery was idled in April 2020 due to weak petroleum fuel demand due to the COVID-19 pandemic.

Par Pacific - Kapolei, HI – Throughput for Q4 2021 at the 95,000-b/d East Plant of the refining complex is targeted at 82,000 b/d to 85,000 b/d, the company said in early November, higher than the Q4 2020 average of 79,000 b/d. The plant averaged 81,000 b/d throughput in Q3 2021. Some 30 days of planned maintenance was conducted at the East Plant in Q3 2020.

Par Pacific - Tacoma, WA – The 42,000-b/d refinery saw Q3 2021 throughputs average 38,000 b/d and as of early November, Q4 throughputs were also holding at that level (on average), the company said in a conference call.

Early in 2021 (February), the plant saw 20 days of turnaround maintenance. No additional major maintenance was planned for the balance of the year. The second part of the Tacoma turnaround is scheduled to take place early in 2022, Par said in February. Under previous ownership, the refinery last saw plantwide maintenance in Q2 2015.

PBF Energy - Martinez, CA – During an April 28 conference call, PBF's management said the company has completed turnaround at the 157,000-b/d refinery's distillate hydrotreater and hydrocracker during Q1 2022. The refinery reported an unspecified “process upset” on March 17, resulting in a Community Warning System Level 1 alert, according to regulatory filings. At a Feb. 10 conference call, PBF officials said the refinery has completed the installation of new reactors for the cat feed hydrotreater and a sulfur plant. At the April 28 conference call, PBF management said the company expects its two West Coast refineries to run at an average 290,000-310,000 b/d for Q2 2022.

PBF Energy - Torrance, CA – Unplanned “emergency” flaring was taking place at the 166,200-b/d PBF Torrance refinery Aug. 15 morning, according to an SCAQMD filing. It is not immediately clear if the incident had any impacts on production. The refinery completed a significant turnaround in July, company officials said during a conference call at the end of the month. Officials did not give details about the scope or duration of the work. As previously reported, the refinery saw planned flaring between June 20 and June 26 due to start-up/shut down activities, according to an environmental notification.

Phillips 66 - Ferndale, WA – A notice filed with the Northwest

Clean Air Agency showed the 110,500-b/d Phillips 66 refinery in Ferndale, Washington, a 45-day planned turnaround was slated to begin on Sept. 6. It is not immediately clear about the exact nature of the planned maintenance.

On June 23, a trader familiar with the matter told OPIS that the 110,500-b/d refinery's FCC is expected to restart around June 28. As previously reported, according to a Northwest Clean Air Agency filing, an upset at a vacuum tower shut down the unit on June 11, with start-up beginning on June 15. OPIS notes that on April 19, an FCC was shut down immediately after a lube oil leak from an air blower caught fire, according to a regulatory filing.

Phillips 66 - Los Angeles, CA – On Sept. 20, a Phillips 66 spokesperson confirmed planned maintenance activity is underway at the 147,000-b/d Los Angeles refinery, and that details regarding the units involved and the duration of the work are considered proprietary.

On Aug. 12, the Carson section of the refinery experienced an "upset at the refinery plant due to a power dip," according to a filing with the California Emergency Management agency. It is not immediately clear if the incident had any impacts on production. As previously reported, unplanned flaring took place at the Wilmington portion of the refinery since July 5 evening, according to SCAQMD filings. A company spokeswoman said Phillips 66 does not comment on operations or commercial activities, adding that there is no planned maintenance underway at the Los Angeles Refinery.

Phillips 66 - Rodeo, CA – A process unit upset on Nov. 11 caused sulfur dioxide release at the 128,000-b/d refinery, with material "partially combusting and flaring directly into the atmosphere, no estimated time of control," according to a California regulatory filing. It is not immediately clear about the reason for the upset. Commenting Oct. 29 on progress of the renewable diesel conversion at the refinery, Phillips 66 officials said the public comment period would close mid-December 2021 and they anticipated getting the project permitted "probably late 1Q (2022)." The company expects full conversion will be completed by early 2024.

RD production (8,000 b/d) from a reconfigured hydrotreater began in July. Full conversion (including use of two high pressure hydrocrackers) would take output to 50,000 b/d of renewable fuels, the company has said.

Valero Energy - Benicia, CA – The 149,000-b/d refinery notified the City of Benicia's Fire Department they are performing planned work on processing units as they shut down some equipment inside the refinery, according to a notification from the fire department. The work is expected to begin Sept. 20 and last for "several days" during which intermittent flaring may take place. It is not immediately clear if the issue has any impacts on production.

On July 21, the refinery also notified the Benicia Fire Department

that it is experiencing a "mechanical issue" with an unspecified unit, leading to the release of sulfur dioxide and flaring. On March 10, the refinery also reported flaring due to a mechanical issue.

Valero Energy - Wilmington, CA – The 93,500-b/d refinery reported unplanned flaring around midday Jan. 21, with "emergency flaring" being listed as the reason of event, according to a regulatory filing. The latest filing didn't identify any units involved or indicate duration of the planned work. As previously reported, the refinery will be in planned maintenance starting the week ending Jan. 21 and through at least February, according to a bulletin sent by Valero. There were no additional details about the nature of the turnaround. In addition, flaring for planned maintenance was reported on Nov. 1, 2021 for the refinery, following two incidences of flaring involving the coker in October. Quarterly reporting on Oct. 21 showed Valero West Coast Q3 throughput at 270,000 b/d, 2,000 b/d lower than Q2 and at the top end of Q3 guidance. Valero's Q4 guidance for modeling for its two West Coast plants is 230,000 to 250,000 b/d.