From:	Dave Jordan
To:	Jones, Dave F (DEC); Stacy, Andrea
Cc:	Collins, Catherine; Simpson, Aaron J (DEC); Ted Hartman (Ted.Hartman@nutrien.com); Don Shepherd; Kirsten King; Andrea Blakesley; Paul Burger
Subject:	RE: [EXTERNAL] Setting Up a Meeting to Discuss New Q/d Calculations
Date:	Friday, September 13, 2019 12:41:41 PM
Attachments:	image001.png

Here are responses to the initial questions that were posed a couple of weeks ago regarding the startup operating scenario and flaring events. We can discuss this information in greater detail during our call.

Start up/Shut Down Scenarios:

- Please provide an overall explanation of what is occurring during the start up scenario(s).
  The startup scenario refers to the operating scenario involving startup of the Ammonia Plant Reformer. The front end of the Ammonia Plant (Reformer) is used to separate natural gas into CO_2 and H_2 gas, and operates at a high temperature. The startup operating scenario involves gradually bringing the Reformer up to its normal operating temperature, which must be performed over time to avoid damage to the equipment. The Startup Heater is used approximately ¾ of the way through the entire start-up process to heat gas within the back end of the ammonia plant where H_2 gas is converted to ammonia. The Startup Heater only operates during startup of the back end of the ammonia plant and is shut down during normal plant operations. All other emission units at the facility are assumed to be operating normally during an Ammonia Plant startup.
  There are no startup operating scenarios for any other emission units at the facility.

- What are the hourly emissions when the turbines and reformer are in start up/shut down modes?
  The emissions attributed to the Reformer during the startup operating scenario assume the unit is operating at its maximum emission rate during the entire time of the startup. In reality, the unit is gradually increasing load through this timeframe and will have emissions well below its maximum allowed emission rate until the end of the startup. The emissions inventory for the startup operating scenario assume that all downstream operations are also operating at maximum operating levels during a startup. In reality (particularly for a "cold" startup described below) downstream urea operations will not be operating at all during the majority of the startup and will only begin normal operations at the end of the Reformer startup.
  There is no startup operating scenario for the turbines. The turbines are all assumed to be operating at their maximum permitted capacity during a Reformer startup and during normal operations of the plant.

- What is the duration of start up/shut down events specifically for the turbines and primary reformer?
  The length of time for a startup for the Reformer is dependent on whether the startup is a "cold" startup or a "warm" startup. A "cold" startup refers to starting the Reformer when the Reformer has not been in operation for several days, which results in the need to bring the unit from ambient temperature to its normal operating temperature. The time period for a "cold" startup is approximately 36 hours. A "warm" startup

occurs when the reformer has been in operation within a short of period of time prior to the startup. The length of time for a "warm" startup varies depending on how recently the Reformer has been in operation, but would typically be around twelve hours.
As noted above, there is no startup scenario proposed for turbines.

- How many start up/shut down events may occur in a 24-hour period per unit at the facility?
  Given the nature of a Reformer startup, no more than one startup would occur within a 24-hour period. KNO's planned operations call for the plant to operate continuously year round, with a planned turnaround resulting in the need for a cold startup only once every four years. The plant is permitted for a total of 200 startup hours in a 12-month period.

Flaring Events:

- What is the maximum number of hours per day that flares may be operational?
  The three flares at KNO are primarily in place for safety purposes to combust gases created during malfunction events that would otherwise be vented to the atmosphere. All three flares are equipped with small natural gas-fired pilot burners that operate continuously, and are assumed to be operating during all operating scenarios at the plant. KNO expects that the flare associated with the ammonia storage tanks will never be used to combust ammonia emissions from storage tanks except during unanticipated malfunction events. There are a limited number of circumstances where the plant would plan to vent ammonia to the Small Flare or the Emergency Flare during turnaround events that occur once every four years. These flaring events would be spaced out over time during a turnaround corresponding to the sequencing of equipment outage and maintenance during the turnaround. The worst case planned flaring event during a turnaround would be the venting of ammonia from a vessel containing 90,000 pounds of ammonia. The fastest this vessel could be vented would be the entire contents of 90,000 over a three-hour period. KNO expects that this would actually be done over a longer period, resulting in lower maximum hourly emissions than identified for the turnaround operating scenario. Regardless, the maximum amount of ammonia that would be vented in a planned flaring event is 90,000 pounds within a 24-hour period. Although there are other planned flaring events that would occur with the Small Flare on different days than the Emergency Flare during the turnaround, the quantity of ammonia that would be vented to the small flare during these events is less than the 90,000 pounds that would be vented to the Emergency Flare. There are no other occasions where flaring is planned during normal operations or during startup.

- Are there or will there be limits on daily flaring events in addition to the annual limits on flaring hours?

  The permit contains limits on maximum hourly emissions from flaring events in addition to the annual limits.

- What are the maximum hourly and daily emissions during flaring events?

  As noted above, the maximum daily and hourly emissions during planned flaring events will occur during turnaround when 90,000 pounds of ammonia are vented to the emergency flare. The maximum hourly emissions during such an event will be venting of this ammonia over a three hour period, which results in 54 pounds per hour of NOx

emissions and 150 pounds per hour of ammonia emissions. Because this event will only last three hours, the total daily emissions will be three times these levels, or 162 pounds per day of NOx and 450 pounds per day of ammonia.

David R. Jordan, P.E.
Partner

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From: Jones, Dave F (DEC) <dave.jones2@alaska.gov>
Sent: Friday, August 30, 2019 1:56 PM
To: Stacy, Andrea <andrea_stacy@nps.gov>
Cc: Collins, Catherine <catherine_collins@fws.gov>; Simpson, Aaron J (DEC) <aaron.simpson@alaska.gov>; Dave Jordan <Dave.Jordan@erm.com>; Ted Hartman (Ted.Hartman@nutrien.com) <Ted.Hartman@nutrien.com>; Don Shepherd <don_shepherd@nps.gov>; Kirsten King <kirsten_king@nps.gov>; Andrea Blakesley <andrea_blakesley@nps.gov>; Paul Burger <Paul_Burger@nps.gov>
Subject: RE: [EXTERNAL] Setting Up a Meeting to Discuss New Q/d Calculations

Andrea,

Meeting after I return on September 9th sounds like the best plan. Aaron and myself have pretty open schedules, so we can let you and Catherine propose a time that works for the both of you.

I think that Ted Hartman and Dave Jordan will be happy to walk us through the answers to the initial questions you have from their updated Q/d calculations spreadsheet.

Regards,

Dave Jones
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From: Stacy, Andrea [mailto:andrea_stacy@nps.gov]
Sent: Thursday, August 29, 2019 1:00 PM

To: Jones, Dave F (DEC) <dave.jones2@alaska.gov>
Cc: Collins, Catherine <catherine_collins@fws.gov>; Simpson, Aaron J (DEC) <aaron.simpson@alaska.gov>; Dave Jordan <Dave.Jordan@erm.com>; Ted Hartman (Ted.Hartman@nutrien.com) <Ted.Hartman@nutrien.com>; Don Shepherd <don_shepherd@nps.gov>; Kirsten King <kirsten_king@nps.gov>; Andrea Blakesley <andrea_blakesley@nps.gov>; Paul Burger <Paul_Burger@nps.gov>
Subject: Re: [EXTERNAL] Setting Up a Meeting to Discuss New Q/d Calculations

Thank you Dave,

Many folks here are out tomorrow due to the upcoming holiday. Why don't we schedule a call discuss this when you return after September 9th?

To that end, we have begun reviewing the revised Q/d calculations provided by Agrium. We have a few initial questions:

Start up/Shut Down Scenarios:

- Please provide an overall explanation of what is occurring during the start up scenario(s).
- What are the hourly emissions when the turbines and reformer are in start up/shut down modes?
- What is the duration of start up/shut down events specifically for the turbines and primary reformer?
- How many start up/shut down events may occur in a 24-hour period per unit at the facility?

Flaring Events:

- What is the maximum number of hours per day that flares may be operational?
- Are there or will there be limits on daily flaring events in addition to the annual limits on flaring hours?
- What are the maximum hourly and daily emissions during flaring events?

Thanks again and we look forward to talking with you in the near future.

On Wed, Aug 28, 2019 at 5:03 PM Jones, Dave F (DEC) <dave.jones2@alaska.gov> wrote:

> Andrea and Catherine,
>
> Agrium has provided the Department with a new spreadsheet (attached) calculating Q/d using four different operating scenarios that are possible at the Kenai Nitrogen Operations facility. The Department would like to open up a dialogue between Agrium and the Federal Land Mangers to discuss this approach moving forward. Please let us know if there is a time that would work for everyone later this week. Otherwise I will be out of the office until Monday September 9th.
>
> Thanks,
>
> Dave Jones
>
> Env. Engineering Assistant I

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