

Tentative Determination Fact Sheet

Last modified on **September 14, 2021**

Fact Sheet – Valley Proteins, Inc.
 Application Number: 04-DP-0024
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MARYLAND DEPARTMENT OF THE ENVIRONMENT
 WATER AND SCIENCE ADMINISTRATION
 INDUSTRIAL AND GENERAL PERMITS DIVISION

SUMMARY REPORT AND FACT SHEET

The Region III EPA Permit Checklist has been used as a guide to the permit review process. The results of the review and supporting rationale for the draft permit are summarized below. Supporting documents are attached including the application status memo (from the Customer Service Center), the draft permit, the application, a copy of the previous fact sheet, and a copy of the previous permit's cover page and special conditions.

Permit Type:	Major ¹	Project Type:	Renewal		
State Application No.:	04-DP-0024	EPA No.:	MD0003247		
Application Received:	6/3/2004	Permit Expiration:	2/28/2006		
Watershed Permitting:	Year: 1	Quarter:	2		
Basin Code:	02.13.03.08	Basin Name:	Transquaking River		
Legal Name of Applicant:	Valley Proteins, Inc.				
Mailing Address:	5420 LINKWOOD ROAD, LINKWOOD, MD 21835				
Facility Name:	Valley Proteins, Inc.				
Location:	5420 LINKWOOD RD, LINKWOOD, MD 21835				
County:	DORCHESTER				
Contact (Name, Title):	Rob Bacon, Wastewater Manager				
Contact Address:	P.O. BOX 38, 5420 LINKWOOD ROAD, LINKWOOD, MD 21835				
Contact Phone:	410-228-1616 x36105	FAX:	410-228-9389		
Contact Email:	rbacon@valleyproteins.com				
SIC Code(s):	2077 Animal Fats				
Applicant discharges from:	A poultry rendering facility				
Via Outfall(s):	001				
Name of Receiving Water Body:	Designated USE Code	Salinity?	Tidal	Discharge is to Tier II Waters?	
Unnamed tributary to Transquaking River and to Higgins Mill Pond	USE I	Fresh	Non-Tidal	No	
MD Coordinates of Facility:	East:	1616.08	North:	326.09	
Subject to EPA review?	Yes – Contains effluent limitation guideline based limits		Public Hearing Req'd?	<u>Yes</u>	
Application Rec'd:	6/3/2004		Re-assigned:	10/15/10	
Project Mgr.:	Robert Pudmericky		Phone:	410-537-3721	
Site Visit(s) Dates:	9/1/2011				
Date Completed:	09/30/2011	Major Revision Dates:	11/15/2011	12/7/2011	06/15/2012
			08/02/2013	08/21/2013	03/15/2014
			03/11/2015	04/01/2015	06/06/2015
			04/30/2015	08/17/2017	01/29/2018
			07/25/2018	09/14/2021	
Reviewed by:	J. Rice	(Initial) JR	Date:		
Accepted by:	M. Richardson	(Initial) MR	Date:		

¹ The current permit (99DP0024) is a minor. We will upgrade the renewal to major status once issued.

I. Description of Facility and Activities Generating Discharge

Valley Proteins, Inc. – Linkwood Facility performs poultry rendering, converting poultry processing waste into pet food. The facility renders approximately 20 million pounds of raw material per week over 5.5 processing days. Poultry offal is separated into animal parts and feathers. The processing of animal parts involves cooking and the separation of grease and solids. Grease is collected in a storage tank and meat meal is stored in a silo. The feather rendering process consists of cooking feathers in a hydrolyzer cooker followed by drying, grinding, and storing the finished product in a silo. A scrubber treats odor-causing compounds before they are released to the atmosphere. The treatment of wastewater generated at the facility is continuous. A maximum of 4.0 million pounds of raw material and an average of 3.64 million pounds of raw material are processed each full day of operation.

The application being processed consists of an original application plus two (2) application amendments. Valley Proteins submitted an application on June 1, 2004, for renewal of a permit to discharge an average of 150,000 gallons per day of treated process wastewater from a poultry rendering facility. This application was identified and tracked as 04-DP-0024. On May 5, 2014, the applicant submitted a permit modification request to increase discharge from an average of 150,000 gallons per day to 575,000 gallons per day of treated process wastewater. The Department acknowledged receipt of this request as a separate modification application, numbered 04-DP-0024A. Subsequently, this application has been combined into the original 04DP0024 application as an amendment. Application 04-DP-0024A is thus no longer being considered. On September 17, 2015 Valley Proteins requested another modification to their application. They requested the inclusion of a Vehicle Maintenance Building which will include a truck wash area. All requests were combined into one application now to be called 04-DP-0024.



Figure 1: Aerial Photo of Valley Proteins Site

Due to the increase in raw material production and the resultant increase in the average daily wastewater flow volume (from 150,000) up to 575,000 gallons per day, Valley Proteins proposes to upgrade the existing wastewater treatment

plant to increase its efficiency and to maintain compliance with any revised discharge limits established in the renewed permit. The future WWTP design will be finalized based on the limits in the final renewal permit.

The wastewater treated by the facility's wastewater treatment plant includes water from scrubber overflows, condensate, plant wash water, vehicle wash water and stormwater runoff. Currently, incoming wastewater first passes through a roto-screen filter, then through a mechanical skimmer to remove floatable solids. Collected solids are returned to the rendering plant for processing. Skimmer effluent is pumped to an anaerobic lagoon, where organic matter is stabilized under anaerobic conditions.

Wastewater from the anaerobic lagoon is pumped to five-state activated sludge biological nutrient removal (BNR) wastewater treatment plant. The BNR plant provides removal of pollutants such as BOD, TSS, total nitrogen and total phosphorus. The effluent from the activated sludge BNR plant discharges by gravity to a final clarifier for settling. Settled return activated sludge is returned to the head of the BNR plant. The treated effluent goes through a chlorine tank and is then discharged to a tributary of Transquaking River via Outfall 001. Valley Proteins has a contractor who removes and disposes of the waste solids from the wastewater treatment facility.

No industrial wastewater goes to municipal sewer or septic. The facility's former sanitary waste disposal area was taken out of service in 2016 for construction of a new maintenance shop and parking area. The new sanitary disposal area is located adjacent to the facility's wastewater treatment system and is in operation. Sanitary waste is no longer being hauled off-site for disposal.

II. Changes from the Previous Permit

The Department proposes to issue the permit with limits on the following changes from the current permit:

1. A maximum limitation of 200 MPN/100mL is proposed for fecal coliform, to be superseded by a proposed maximum limitation of 126 MPN/100mL for E. coli within one year of permit issuance.
2. Monitoring without limitations are proposed for flow and total Kjeldahl nitrogen.
3. The Department proposes a compliance schedule of three years for upgrading wastewater treatment at the facility and implementation of new limitations at Outfall 001. The value of the new limitations will be determined by the future flow volume chosen by the applicant.
4. No later than three years following the permit effective date, the applicant must elect limitations based on a flow rate of 150,000 or a flow rate of up to 575,000 gallons per day (gpd). Each option is associated with a different set of proposed stricter limitations which will become effective upon election of a chosen path by the permittee. Once a path is selected, it cannot be changed without major permit modification. The terms of the proposed compliance schedule, including interim milestones, are expressed in a narrative condition in the draft permit.
5. Regardless of the path selected, the Department proposes the following new limitations at Outfall 001 to become effective once the selection is made: total nitrogen (8,477 lbs/year maximum), total phosphorus (315 lbs/year maximum), biochemical oxygen demand (from Apr.-Nov.: 6.0 mg/L average); total Kjeldahl nitrogen (2.8 mg/L annual average); and pH (range of 6.0 to 7.8).
6. Should the applicant elect an average flow rate of 150,000 gpd, the Department proposes the following additional new limitations at Outfall 001: biochemical oxygen demand (from Dec.-Mar.: 12 mg/L average); ammonia (from Apr.-Nov.: 1.5 mg/L average, 12.2 mg/L maximum; from Dec.-Mar.: 3.3 mg/L average, 12.5 mg/L maximum); and dissolved oxygen (6.0 mg/L minimum).
7. Should the applicant elect to increase the average flow rate above 150,000 gpd (up to a potential average of 575,000 gpd), the Department proposes the following additional new limitations at Outfall 001: biochemical oxygen demand (from Dec.-Mar.: 8.0 mg/L average); ammonia (from Apr.-Nov.: 1.4 mg/L average, 12.2 mg/L maximum; from Dec.-Mar.: 3.2 mg/L average, 12.2 mg/L maximum); and dissolved oxygen (from Apr.-Nov.: 6.5 mg/L minimum; from Dec.-Mar.: 6.0 mg/L minimum).
8. In addition to the above numeric limitations and monitoring, the Department also proposes to require chronic whole effluent toxicity testing following the installation of the new wastewater treatment, updated monitoring of groundwater at several locations on the property, updated sludge management (including specific reporting

requirements), a prohibition on ground application of wastewater, authorizes vehicle washing and boiler blowdown discharges, requires use of sufficiently sensitive test methods, and requires the permittee to obtain coverage under the industrial stormwater general permit.

III. Review of SWPPP

The permittee currently maintains a Stormwater Pollution Prevention Plan (SWPPP) on-site as a requirement in the individual permit. The permit requires pollution prevention measures which are incorporated in the SWPPP. Greater than 90 percent of the stormwater associated with industrial activity at the rendering plant flows to the stormwater management pond. Discharge piping along the inner slope of the pond can be sealed and the discharge valve at the receiving stream is normally closed and locked. The facility strives to collect all of the stormwater flow in the pond, and then pump this water to the facility's wastewater treatment system for processing. In this way most of the stormwater from the rendering plant and adjacent parking areas is treated. The facility's SWPPP was update on April 17, 2017 following construction on the southeast portion of the site..

IV. Results of File Review

Monitoring of ground water nitrates was required in the previous permit using eight monitoring wells. The contamination was due to now discontinued spray irrigation fields and leaking lagoons which are now lined. There has been no spray irrigation of treated wastewater at the site since 1991. The nitrogen concentrations have dropped significantly since 2005 and are at normal levels for six of the eight installed wells.

Discharge monitoring report (DMR) data files were reviewed, and the resulting summary information is provided in Section VIII of this fact sheet, Detailed Assessment of Liquid Waste – Outfall 001.

V. Results of Studies

Per Special Condition P in the current permit, biomonitoring was the only study that was required. Whole effluent toxicity testing results show 100 % survival rate for the *C. dubia* and *P. promelas* organisms, which indicates that the discharge did not exhibit toxicity. The sample was collected on 12/22/04 and the copy of the lab report is on file.

VI. Compliance History

The compliance status of the facility is currently under review and moving towards resolution. This process is happening concurrently, but is a different process from the permitting process. Thus the facility's compliance history is not being addressed in this section.

VII. Outfall Details

Table A: Outfall Details

Outfall or Monitoring Point #	Where will the Discharge be Monitored	What are the Waste Streams that contribute to the Discharge	Average Flow (gpd)	Comments	Outfall Coordinates (in 1000 ft)	
					Northing	Easting
001	weir of the dechlorination contact tank	dechlorinated wastewater made up of scrubber overflows, condensate, plant wash water, and vehicle wash water.	150,000 ⁽²⁾	some wastewater is recycled back to the plant, thus reducing the impact of overall increase in water consumption	326.09	1616.08
Total			150,000 575,000⁽³⁾			

VIII. Detailed Assessment of Liquid Waste – Outfall 001

Inspection at the Outfall 001 sampling location shows that the discharge is relatively clear in appearance. Further inspection at the receiving stream does not reveal any floating solids or visible foam.

Table B: Outfall 001 Waste Stream Characteristics

Type of wastewater in Outfall 001:	dechlorinated wastewater made up of scrubber overflows, condensate, vehicle wash water, plant wash water and stormwater		
Treatment Unit:	Anaerobic pond, activated sludge system, chlorination, de-chlorination, and post aeration		
Discharge Type:	Continuous	Period:	Throughout the year
Potential Basis for Whole Effluent Toxicity (Biomonitoring) Testing	We will continue to assess the wastes for potential toxicity, since the facility and treatment involve a complex effluent. Biomonitoring will be required after the plant upgrade is completed. See Special Condition K for details.		

Table C: Effluent Characteristics from Application
(Values from the application)

Pollutant	Maximum Value		Average Value		Units		Source of Data/ Number of Analyses
	Conc	Other	Conc	Other	Conc	Other	
Chemical Oxygen Demand (COD)	3.6	39			mg/L	lbs/day	Application
Total Organic Carbon (TOC)	21.6	23			mg/L	lbs/day	Application
Temperature (winter)			10 (50)		°C (°F)		Application
Temperature (summer)	10 (50)		30 (86)		°C (°F)		Application
Nitrate-Nitrite (as N)	46	69	33	50	mg/L	lbs/day	Application
Nitrogen, Total Organic (as N)	7	7.6			mg/L	lbs/day	Application
Sulfate (as S)	139	151			mg/L	lbs/day	Application

² Flow listed in the application. The long-term flow from 2018 through 03/31/2021 is 170,478 gpd.

³ Requested expanded flow.

Pollutant	Maximum Value		Average Value		Units		Source of Data/ Number of Analyses
	Conc	Other	Conc	Other	Conc	Other	
Sulfide (as S)	2	2.2			mg/L	lbs/day	Application
Sulfactants	0.092	0.099			mg/L	lbs/day	Application
Magnesium	167	180			mg/L	lbs/day	Application
Chlorine, Total residual	< 0.1	< 0.1	< 0.1	< 0.1	mg/L	lbs/day	Application

Table D: Effluent Characteristics from Discharge Monitoring Reports
(Values from Discharge Monitoring Reports submitted from beginning of 2018 through 03/31/2021)

Parameter (Statistic Below)	Average of DMR Value	Max of DMR Value	Units
BOD, 5-day, 20 deg. C			
Average Amount	24.36		lbs/day
Average Concentration	18.25		mg/L
Maximum Amount		176.80	lbs/day
Maximum Concentration		125.00	mg/L
Chlorine, total residual			
Maximum Concentration	0.10	0.10	mg/L
Coliform, fecal general			
Average Concentration	85.82		MPN/100mL ⁴
Maximum Concentration		2,419.60	MPN/100mL
Flow, in conduit or thru treatment plant			
Average Amount	0.17		MGD ⁵
Maximum Amount		0.41	MGD
Nitrogen, ammonia total [as N]			
Average Amount	7.58		lbs/day
Average Concentration	6.89		mg/L
Maximum Amount		146.60	lbs/day
Maximum Concentration		158.00	mg/L
Nitrogen, nitrate total [as N]			
Maximum Concentration	5.28	22.60	mg/L
Nitrogen, total [as N]			
Average Amount	18.19		lbs/day
Average Concentration	15.57		mg/L
Maximum Amount		167.00	lbs/day
Maximum Concentration		160.50	mg/L
Oil & Grease			
Average Amount	0.58		lbs/day
Average Concentration	0.49		mg/L
Maximum Amount		9.80	lbs/day
Maximum Concentration		6.90	mg/L
Oxygen, dissolved [DO]			
Minimum	6.68	9.48	mg/L
pH			
Average		7.67	s.u.

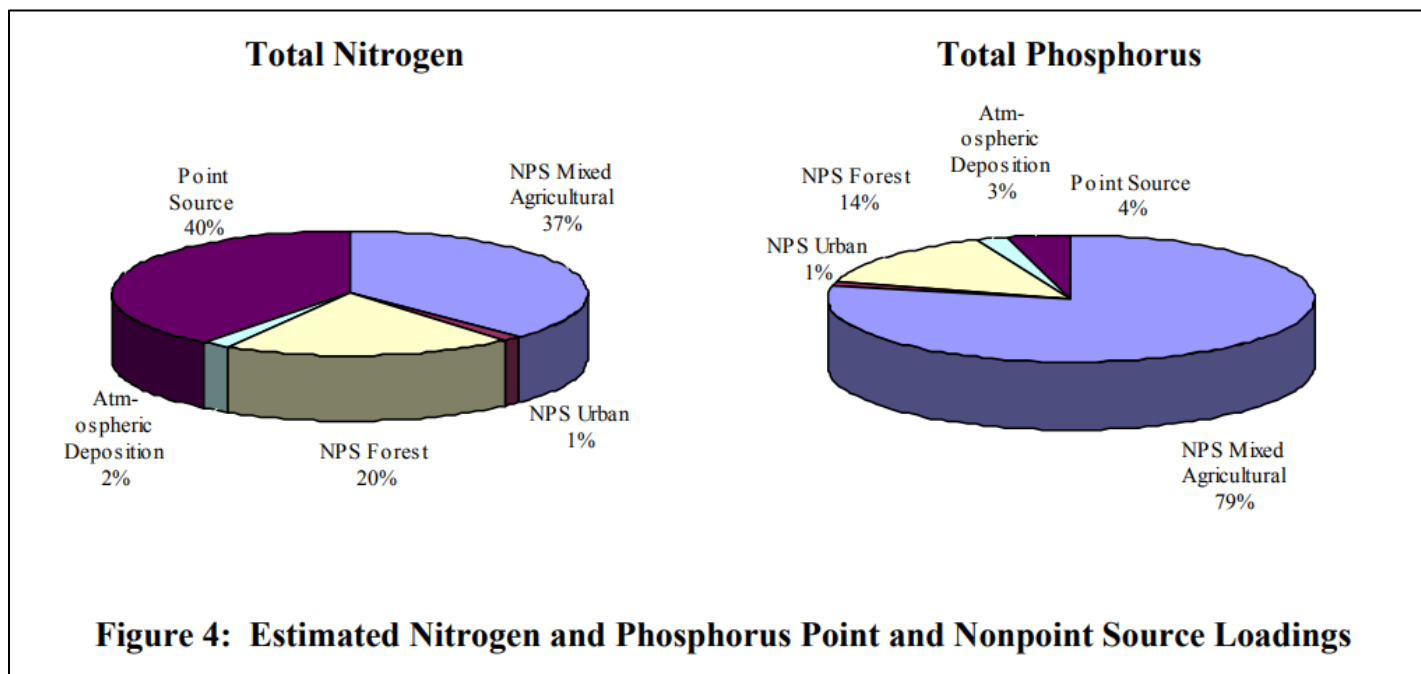
⁴ Most Probable Number per 100 mL

⁵ Millions of gallons per day

Parameter (Statistic Below)	Average of DMR Value	Max of DMR Value	Units
Maximum		9.00	s.u.
Minimum		4.30	s.u.
Phosphorus, total [as P]			
Average Amount	0.95		lbs/day
Average Concentration	0.57		mg/L
Maximum Amount	2.09		lbs/day
Maximum Concentration	1.19		mg/L
Solids, total dissolved			
Maximum Concentration	1,778.54	11,744.00	mg/L
Solids, total suspended			
Average Amount	10.59		lbs/day
Average Concentration	7.56		mg/L
Maximum Amount		48.60	lbs/day
Maximum Concentration		49.30	mg/L

IX. Total Maximum Daily Load (TMDL) Status of the Receiving Water

The facility discharges into an unnamed tributary to Transquaking River (Transquaking River watershed, Basin Code 02.13.03.08) which flows into the Higgins Millpond and to Chesapeake Bay. The Transquaking River is listed on the 303 (d) list for nutrients and sediments. The [*Total Maximum Daily Loads of Nitrogen and Phosphorus for the Transquaking River, Dorchester County, Maryland*](#)⁶, was approved by the EPA on March 9, 2000. The Transquaking River drains to the Chesapeake Bay through Fishing Bay, and is part of the Lower Eastern Shore Tributary Strategy Basin. At the time the TMDL was developed, the single point source discharge was the Valley Proteins facility (formerly Darling International Inc), contributing a major load to the watershed. The facility was characterized as a rendering facility contributing 354,050 lb/yr of nitrogen and 1,825 lb/yr phosphorus to the basin.



⁶ https://mde.maryland.gov/programs/water/tmdl/approvedfinaltmdls/pages/tmdl_transquaking.aspx

Figure 2: Pie Charts from Transquaking River TMDL Document

The facility load was also included in the above listing of all sources of nitrogen and phosphorus. At the time, point sources represented over 40% of the nitrogen load and 4% of the phosphorus load.

The TMDL identified a roadmap for various nutrient loading required to meet water quality standards. It broke down the loading into two distinct times of the year. The most restrictive was the low flow months which favored harmful algae. The other evaluation was an overall annual load for the entire year. The Valley Proteins operation was required to meet more restrictive loads as part of the overall strategy.

The critical season for excessive algal growth in the Transquaking River is during the summer months for low flow and average flow conditions. During low flow conditions the stream is poorly flushed, resulting in slow moving, warm water, which is susceptible to excessive algal growth. During average flow conditions, the increased nonpoint source nutrient loads can cause excessive algal growth. The model results indicate that, under expected low flow conditions, the desired water quality goals are achieved with the reduced nutrient loads, established in the TMDL. The low flow TMDLs are stated in monthly terms because low flow conditions occur for shorter periods of time.

EPA requires that TMDL allocations account for all significant sources. The technical memorandum *Significant Nutrient Point Sources and Nonpoint Sources in the Transquaking River Watershed* identifies the significant surface water discharges of nutrients, and significant nonpoint sources and their distribution between different land uses. TMDLs were established in the Transquaking River watershed for both low-flow and average annual conditions. The following Tables 1A and Table 1B from the TMDL memorandum provide point source waste load allocation information for low-flow and average annual TMDLs for total nitrogen (TN) and total phosphorus (TP) respectively.

Table 1A				
Loads Attributed to Significant Point Sources for Low-Flow and Average Annual Nitrogen TMDLs^a				
Source Name	Permit Number	TN Load <i>lbs/month</i>	Flow <i>mgd</i>	Concentration <i>mg/l</i>
Darling International, Inc	MD0003247	1,231	0.246	20

Table 1B				
Loads Attributed to Significant Point Sources for Low-Flow and Average Annual Phosphorus TMDLs^a				
Source Name	Permit Number	TP Load <i>lbs/month</i>	Flow <i>mgd</i>	Concentration <i>mg/l</i>
Darling International, Inc	MD0003247	123	0.246	2

Figure 4: WLA Tables from Transquaking River TMDL Technical Memorandum

The waste load allocations (WLAs) for Valley Proteins, Inc. are 1,231 lbs/month for nitrogen and 123 lbs/month for phosphorus were based on implementing technology that achieve 20 mg/L for TN and 2 mg/L for TP.

The *Chesapeake Bay Total Maximum Daily Load for Sediments, Nitrogen and Phosphorus* issued on December 29, 2010, limits total (net) discharges of nitrogen, phosphorus and sediment that ultimately reach the Bay. The facility’s allocation described above in the Transquaking River TMDL is consistent with aggregate load allocations for TN and TP listed in the Bay TMDL.

The Transquaking River watershed is also listed as impaired for TSS, but a localized TMDL has yet to be completed.

X. Anti-degradation Review and Tier II Status of the Receiving Stream

This discharge does not go (directly or downstream) to Tier II waters. Consequently this permit has been constructed to protect and maintain the receiving streams existing uses and the basic uses of water contact recreation, fishing, protection of aquatic life and wildlife, and agricultural and industrial water supply as is associated with its designated Use.

XI. Standards

Tables E and G (below) present applicable technology and water quality standards for each pollutant of concern. These standards were compared against the levels of pollutants found in the discharge and used to determine the final permit monitoring, limits and special conditions. In Table E, 40 CFR §432 refers to federal effluent limitation guidelines (ELGs) established for the Meat and Poultry Products Point Source Category, Subpart J, which are applicable for the Renderers subcategory. The water quality standards in Table G stem from Maryland regulatory standards, applicable TMDLs, or site-specific modeling completed for the purposes of this renewal permit.

Table E: Technology Standards

Pollutant	Maximum Value		Average Value		Units		Regulatory Basis
	Conc	Other	Conc	Other	Conc	Other	
Ammonia (as N)		0.14		0.07		lbs/1000 lbs raw material	40CFR 432
Total Nitrogen	194		134		mg/l		40CFR 432
BOD ₅		0.18		0.09		lbs/1000 lbs raw material	40CFR 432
Fecal Coliform	400				MPN/100ml		40CFR 432
Oil & Grease		0.10		0.05	mg/l	lbs/1000 lbs raw material	40CFR 432
TSS		0.22		0.11		lbs/1000 lbs raw material	40CFR 432
pH (min-max)		6.0-9.0				s.u.	40 CFR 432.3

ELG Loading Limit Calculations for the above Technology Standards Table (if based on updated production levels):

Note that, as reflected in Section XII of this fact sheet, the Department has opted to not increase ELG-based limits for increases in production, stating that the permittee would need to complete a comprehensive site-specific model of water quality to demonstrate that there was assimilative capacity. Assuming the updated projection level of 3,640,000 lbs/day proposed by the permittee, if the Department based limitations strictly on the ELG limits, they would be as follows in Table 6. The original ELG-based limits were derived based on a production level of 1,000,000 lbs/day, which has continued as the basis in renewal permits despite increases in production in order to ensure protection of water quality. Table 6 includes the limit based on 1,000,000 lbs/day of production for comparison.

Calculations were done by:

$$\text{Limit (lbs/day)} = (\text{Production Level in lbs of raw material/day}) \times (\text{ELG for the Parameter in lbs/1,000 lbs of raw material})$$

Table F: Calculated ELG-Based Limits at Differing Production Levels

Parameter	Based on Production of 3,640,000 lbs/day		Based on Production of 1,000,000 lbs/day	
	Daily Maximum Limit (lbs/day)	Monthly Average Limit (lbs/day)	Daily Maximum Limit (lbs/day)	Monthly Average Limit (lbs/day)
Ammonia	509.6	254	140	70
BOD	655.2	327	180	90
TSS	800.8	400	100	50
Oil & Grease	364	182	220	110

Table G. Water Quality Criteria

Pollutant	Maximum Value		Average Value		Units		Regulatory Basis
	Conc	Other	Conc	Other	Conc	Other	
pH	7.8						modeled
Dissolved Oxygen	5.0 minimum				mg/l		COMAR 26.08.02.03-3A(3)
Dissolved Oxygen	6.0 minimum				mg/l		modeled at flow of 0.15 MGD
E. coli			126		MPN/ 100 ml		COMAR 26.08.02.03-3A(1)
Fecal coliform			200		MPN/ 100 ml		COMAR was revised to remove this limit, effective one year after the effective date of the permit. It will be replaced with the E. coli standard.
Kjeldahl Nitrogen, Total (TKN)	2.8				mg/l		modeled
Nitrogen, Total (as N)		1,231*				lbs/ month	Nitrogen TMDL waste load allocation for the Transquaking River (May 1 – Oct. 31).
Nitrogen, Total (as N)		8,477				lbs/year	modeled
Phosphorus, Total (as P)		123**				lbs/ month	Phosphorus TMDL waste load allocation for the Transquaking River (May 1 – Oct. 31).
Phosphorus, Total (as P)		315				lbs/year	modeled
Total Residual Chlorine	0.019		0.011		mg/l		COMAR 26.08.02.03-2G(1)
Between April 1 and November 30							
Ammonia	23.0		4.2		mg/l		COMAR 26.08.02.03-2
Ammonia (as N)	12.2		1.5		mg/l		COMAR 26.08.02.03-2 - modeled at flow of 0.15 MGD - Between April 1 and November 30

Pollutant	Maximum Value		Average Value		Units		Regulatory Basis
	Conc	Other	Conc	Other	Conc	Other	
Ammonia (as N)	12.2		1.4		mg/l		COMAR 26.08.02.03-2 - modeled at flow of 0.575 MGD - Between April 1 and November 30
BOD		39.0		31.0		lbs/day	Assimilative study modeled in 1981.
BOD			6.0		mg/l		modeled at flow of 0.15 MGD - Between April 1 and November 30
BOD			6.0		mg/l		modeled at flow of 0.575 MGD - Between April 1 and November 30
Oil & Grease		20.0		13.0		lbs/day	Assimilative study modeled in 1981.
TSS		53.0		39.0		lbs/day	Assimilative study modeled in 1981.
Dissolved Oxygen	6.5 minimum				mg/l		modeled at flow of 0.575 MGD - Between April 1 and November 30
Between December 1 and March 31							
Ammonia	23.0		10.0		mg/l	lbs/day	COMAR 26.08.02.03-2
Ammonia (as N)	12.5		3.3		mg/l		COMAR 26.08.02.03-2 - modeled at flow of 0.15 MGD - Between December 1 and March 31
Ammonia (as N)	12.2		3.2		mg/l		COMAR 26.08.02.03-2 - modeled at flow of 0.575 MGD - Between April 1 and November 30
BOD		180.0		90.0		lbs/day	Assimilative study modeled in 1981.
BOD			12		mg/l		modeled at flow of 0.15 MGD - Between December 1 and March 31
BOD			8.0		mg/l		modeled at flow of 0.575 MGD - Between April 1 and November 30
Oil & Grease		100.0		50.0		lbs/day	Assimilative study modeled in 1981.
TSS		220.0		110.0		lbs/day	Assimilative study modeled in 1981.
Dissolved Oxygen	6.0 minimum				mg/l		modeled at flow of 0.575 MGD - Between April 1 and November 30

NOTE: * Annual nitrogen loading is calculated as: 1,231 lbs/month x 12 month/ year x 0.75 = 11,079 lbs/ year
 ** Annual phosphorus loading is calculated as: 123 lbs/month x 12 month/ year x 0.75 = 1,107 lbs/ year

XII. Rationale for Effluent Limitations and Monitoring

The limitations for the permit were derived by comparing the applicable technology and water quality standards and selecting the most restrictive. In cases where the limitations are ELG-based, such as the winter limits for BOD, TSS, and oil & grease, the Department has continued to base them on a production level of 1,000,000 pounds of raw product per day, which was the original basis when ELGs were first implemented in this permit. This matches what the Department has done over the years, as only the ELG limits based on this level were confirmed as acceptable based on water quality modeling. In order to propose an update on such limits to reflect increased production levels, it would be necessary for the permittee to complete a comprehensive water quality model to demonstrate the increased limits would be protective. Furthermore, the permittee has demonstrated the ability to continue meeting the existing limitations despite gradual increases in production over the past 30-plus years.

Fecal Coliform (FC)/E-coli (water quality based): The limit for FC continues from the previous permit and will remain in effect for one year from the date of the issuance of this permit. After one year, the old FC standard will be replaced with E. coli, which is the replacement water quality standard adopted in COMAR 26.08.02.03-3 during the permit term. The previous permit limited Fecal Coliform to 200 MPN per 100 ml of effluent as a geometric mean measured once per week. This permit limits E. coli to 126 MPN per 100 ml, per COMAR 26.08.02.03-3A(1), as a geometric mean also measured once per week.

Total Residual Chlorine (water quality based): The facility uses chlorine to treat for bacteria to meet the water quality standards. The limit is based on water quality from Table G. However, the measurements are based on non-detectable levels of chlorine per COMAR 26.08.03.06D. Per COMAR 26.08.03.06C(5), if the chlorine is below detection limits, it may be discharged.

pH (technology based): The pH limits will initially be maintained at the technology-based range used in the last permit. This is consistent with the ELG limits for the entire Meat and Poultry Products Point Source Category, as expressed at 40 CFR §432.3, applied at the end of pipe. However, upon plant upgrade pH maximum will be limited to 7.8. This is necessary to make sure that the modeled TKN value is met (see discussion on TKN modeling below).

Biochemical Oxygen Demand (BOD₅), Total Kjeldahl Nitrogen (TKN), and Dissolved Oxygen (DO): A Streeter-Phelps Equation (INPRG) model was run to determine limits necessary to maintain DO levels above the water quality criteria in the stream between Valley Proteins' outfall and the Higgins Millpond. The model output the optimal levels of BOD, TKN and DO. The limit values for BOD, TKN and DO are listed in the Water Quality Criteria table above with a regulatory basis of "modeled". The modeled limit for BOD is new in that it is a concentration limit. The previous loading limits for BOD and are being continued to prevent backsliding. The limit for TKN is new. The limits will take effect after the wastewater treatment plant is upgraded. The limit for DO is being continued, but a new limit based on the model will take effect once the wastewater treatment plant is upgraded.

Phosphorus, Total (TP): To prevent algal blooms the reservoir needs to stay in an oligotrophic⁷ state. The Vollenweider model was run to find the TP Loading which corresponds to the flush rate will maintain the Higgins Millpond. Via the model, we estimated that the pond can receive a maximum of 488 lbs/year to prevent eutrophication. Of that total, the annual loading limit for Valley Protein was set at 315 lbs/year. This is a 79% reduction from the limit (1,497 lbs/year) in the current permit. The limits will take effect after the wastewater treatment plant is upgraded.

⁷ Oligotrophic, as referring to lakes and ponds, means to be relatively low in plant nutrients and containing abundant oxygen in the deeper parts.

Ammonia: The water quality criteria for ammonia have been updated since the last permit was issued. To comply with the updated criteria, the water quality-based limits for ammonia needed to be updated. The updated calculated values are listed in Table G (Section XI of this fact sheet, above). The limits continue to be based off of COMAR 26.08.02.03-2. There also continue to be different sets of seasonal limits. Finally, limit sets were calculated based on the current flow and the requested expanded flow.

Nitrogen, Total (TN): The aggregate load assigned to Valley Protein in the Chesapeake Bay TMDL is being implemented as an annual limit, 8,477 lbs/year. This is a 43% reduction from the limit previous limit which equated to 14,772 lbs/year in the current permit. The limits will take affect after the wastewater treatment plant is upgraded.

Suspended Solids, Total (TSS) and Oil & Grease - Between April 1 and November 30: The Department developed loading permit limits for these parameters in 1981. A stream assimilative study was conducted by the Department, including Streeter-Phelps model to evaluate dissolved oxygen, which indicated that the limits were adequate to protect the receiving stream's water quality criteria. The limits have been in place since that time and have been deemed to be protective of water quality. Thus the current limits will be maintained to prevent backsliding. Based on the current performance data, the facility is expected to be able to continue to meet these limits.

Suspended Solids, Total (TSS) and Oil & Grease - Between December 1 and March 31: The current winter loading limits for BOD, TSS, and Oil & Grease were based on EPA's guidelines specifying use of best available technology for treatment for the rendering industry. The limits were production based using 1,000,000 pounds of raw material processed per day. Based on the development of limits during the permit in 1981, the limits were deemed to be protective with season all limits. Since then the production rate has increased from 1 million lbs/day, to 2 million lbs/day of raw material processed during the existing permit, to a proposed 4.0 million lbs/day. This increase would allow higher production based limits based on the ELG. However, the current limits will be kept because they have shown to be protective of water quality. Thus, the current limits will be maintained to prevent backsliding. Based on the current performance data, the facility is expected to be able to continue to meet these limits.

XIII. Rationale for Special Conditions in the Draft Permit

- B. **DEFINITIONS** – The included definitions have been edited from the standard list of 41 definitions so that only the ones relevant to this permit are included.
- C. **TOXIC POLLUTANT REPORTING** – This condition has been continued from the previous permit. The text of this condition has been updated to current standards. This requirement is to address the release of any toxic pollutants not anticipated in the permit review process.
- D. **REMOVED SUBSTANCES** – This condition has been continued from the previous permit. The text of this condition has been updated to current standards. This requirement is to assure that pollutants do not reach State waters by some other route. Standard inclusion, but only activated if we determine a potential need for this information.
- E. **ANALYTICAL LABORATORY** – This condition has been continued from the previous permit. The text of this condition has been updated to current standards. This requirement is included because the Department may need to know who is doing the testing.
- F. **WASTEWATER OPERATOR CERTIFICATION** – This heading has been continued from the previous permit. This requirement is to assure that a properly trained person is operating the wastewater treatment system. The certification is for Class 5, per COMAR 26.06.01.

- G. **FLOW MONITORING** – This requirement is to increase the probability that flow is being monitored competently.
- H. **FLOW BASIS FOR ANNUAL DISCHARGE PERMIT FEE** – This condition was added to all new/renewal permits to improve fee determinations. This requirement is to assure that we have the correct flow on which to base the annual fee.
- I. **REAPPLICATION FOR A PERMIT** – This condition and language was added to all new/renewal permits to comply with current watershed permitting requirements. This requirement is normally to assure that we have the application in time to reissue the permit by its watershed schedule.
- J. **PERMIT REOPENER FOR TOTAL MAXIMUM DAILY LOAD (TMDL)** – This condition allows the permit to be reopened if a TMDL is issued or approved for the watershed in which this facility resides. Additionally, this requirement allows for the permit to be re-opened should changes to the implementation plans of the Chesapeake Bay nutrient TMDL require it or a nutrient general permit is issued.
- K. **BIOMONITORING PROGRAM** – This requirement is automatically required for major permits, and for minors, such as this. Due to the proposed increase in the flow the biomonitoring will be required after an appropriate startup and shake down of the new system. After the startup the permittee has to notify the Department that the plant is fully operational.
- L. **TOXICITY REDUCTION EVALUATION** – The text of this condition has been updated to current standards. This requirement defines the steps necessary to determine the cause of toxicity, once toxicity has been identified.
- M. **MIXING ZONES AND POLLUTION PREVENTION** – This condition was added to all new/renewal permits to provide an opportunity for the permittee to implement the goals of the “Chesapeake 2000 Bay Agreement”. This requirement is included because the goal of eliminating toxic pollutants in discharges, especially with the elimination of the mixing zone option, will not generally be attainable by wastewater treatment, so we are trying to get permittees to establish a pollution prevention program now. It has been marked [Reserved] in the permit since there are not any toxics that require a mixing zone to meet water quality standards.)
- N. **PROTECTION OF WATER QUALITY** – This condition puts the permittee on notice that there are occasions where they may be held accountable for failure to comply with state water quality standards regardless of whether there is a specific limit in the permit.
- O. **ODOR CONTROL REQUIREMENT** – This condition will be continued from the previous permit to ensure odor control measures are taken to minimize the odors generated by the plant operation. The anaerobic digestion lagoon has an odor and the problem is solved in part by maintaining a layer of floating scum.
- P. **GROUNDWATER MONITORING REQUIREMENTS** – Even though the spray irrigation fields have not been used for the past several years, the sampling data continue to indicate some type of legacy pollution issue. We reviewed the most recent monitoring well data. We summarized the data in the tables below. All data is in mg/L. The pink/red highlight indicates values that are above the standard. The parameters monitored under the previous permit were TDS, fecal coliform and nitrates. Each monitoring well has high values for one thing or another. This special condition is necessary to monitor the presence of contaminants in the groundwater and the effectiveness of the previous compliance plan. The Department will review the results of the sampling and determine what, if any, further corrective

measures will be necessary to address the excessive levels in groundwater. These monitoring requirements are updated from the requirements in the previous permit. In particular the renewal permits requires installation and re-siting of some monitoring wells. It also requires monitoring for an expanded suite of parameters which include Total Kjehdahl Nitrogen, Ammonia, Nitrate, Total Dissolved Solids, and Fecal Coliform.

Total Dissolved Solids (TDS)

Monitoring Period End Date	MW1	MW2	MW3	MW4	MW5	MW6	MW7	GW Drinking Standard
06/30/2018	660							500
09/30/2018	840							500
12/31/2018		238	174	128	222	200	10,810	500
03/31/2019	456	212	192	150	219	148	10,316	500
06/30/2019	660	260	210	166	262	246	11,744	500
09/30/2019	682	736	216	182	302	408	10,600	500
12/31/2019	690	782	206	192	296	280	8,800	500
03/31/2020	718	378	192	208	308	422	11,500	500
06/30/2020	706	290	220	234	338	180	11,600	500
09/30/2020	788	518	204	224	282	170	10,600	500
12/31/2020	685	285	220	235	290	182	9,860	500
03/31/2021	840	372	208	230	302	182	9,420	500
Average	702	407	204	195	282	242	10,525	500
Median	690	331	207	200	293	191	10,600	500

Fecal Coliform

Monitoring Period End Date	MW1	MW2	MW3	MW4	MW5	MW6	MW7	GW Drinking Standard
06/30/2018	160.							2
09/30/2018	.1							2
12/31/2018		2.	2.	2.	2.	4.	2.	2
03/31/2019	2.	2.	2.	2.	2.	2.	2.	2
06/30/2019	160.	160.	160.	24.	4.	160.	160.	2
09/30/2019						3.		2
12/31/2019	1.	1.	1.	1.	1.	2.	1.	2
03/31/2020	1.	1.	1.	1.	1.	1.	1.	2
06/30/2020	1.	1.	1.	1.	1.	12.	1.	2
09/30/2020	1.	1.	24.	1.	1.	1.	1.	2
12/31/2020	1.	1.	1.	1.	1.	1.	1.	2
03/31/2021	.1	.1	.1	.1	.1	.1	.1	2
Average	33	19	21	4	1	19	19	2
Median	1.	1.	1.	1.	1.	2.	1.	2.

Nitrates

Monitoring Period End Date	MW1	MW2	MW3	MW4	MW5	MW6	MW7	GW Drinking Standard
06/30/2018	0.34	6.37	9.52	0.30	17.40			10.00
09/30/2018	2.04							10.00
12/31/2018						0.20	0.70	10.00
03/31/2019	0.30	5.16	10.20	0.30	17.50	2.40	0.22	10.00
06/30/2019	0.34	5.23	11.00	0.32	20.50	0.02	0.02	10.00
09/30/2019	1.42	7.68	12.30	0.38	22.60		0.30	10.00
12/31/2019	0.95	4.00	11.90	0.35	21.80	0.28	0.71	10.00
03/31/2020	0.22	7.47	5.16	0.34	21.90	0.24	0.41	10.00
06/30/2020	2.06	7.45	9.30	0.25	22.00	1.00	0.38	10.00
09/30/2020	0.74	4.72	9.25	0.30	20.40	0.23	0.43	10.00
12/31/2020	4.18	6.14	8.00	0.30	12.20	0.47	0.22	10.00
03/31/2021	2.04	3.53	7.64	0.32	19.70	0.45	0.46	10.00
Average	1.33	5.78	9.43	0.32	19.60	0.59	0.39	10.00
Median	0.95	5.69	9.41	0.31	20.45	0.28	0.40	10.00

- Q. **SLUDGE MANAGEMENT PLAN** – This condition was updated from the condition which was in the previous permit. Sludge is generated at this facility during various stages of the treatment process and the excess sludge is hauled away. Once every 12-months, the permittee shall report to the Department the quantity of sludge expected to be generated for the coming calendar year and how all sludge generated at the facility shall be disposed of. The permittee shall manage and report the removal of sludge to offsite locations in accordance with Special Condition D.1 - Removed Substances.
- R. **PROHIBITION ON APPLICATION OF WASTEWATER TO GROUND** – This permit will no longer authorize groundwater discharge. The condition will prohibit use of spray fields or any other method of wastewater application on the ground to avoid additional contamination.
- S. **VEHICLE WASHING AND BOILER BLOWDOWN** – The condition addresses specific conditions related to vehicle washing and to boiler blowdown.
- T. **COMPLIANCE SCHEDULE FOR NUTRIENTS** – The condition is self-explanatory.
- U. **USE OF SUFFICIENTLY SENSITIVE TEST METHODS** - The Department has begun including this condition to explicitly reference the need for use of sufficiently sensitive test methods per 40 CFR §122.44.
- V. **STORMWATER ASSOCIATED WITH INDUSTRIAL ACTIVITIES** - This condition requires the permittee to keep up-to-date their stormwater pollution prevention plan. Then within 30-days of issuance they will be required to obtain industrial stormwater coverage under the general industrial stormwater permit (currently the 12-SW). The Department is transitioning to requiring all industrial stormwater coverage come via the industrial stormwater general permit. This requirement is included because 40 CFR 122.26 identifies this facility for industrial stormwater regulation.

XIV. Anti-Backsliding Review

The permit complies with anti-backsliding regulations (40 CFR §122.44(l)). This permit is being renewed with effluent limitations, standards or conditions at least as stringent as the final effluent limitations, standards, or conditions in the previous permit. Additionally, in the case of any effluent limitations established on the basis of Section 402(a)(1)(B) of the CWA, the permit is being not being renewed with effluent limitations which are less stringent than the comparable effluent limitations in the previous permit.