Florida Phosphate Mining
Technical Report Summary
Effective December 31, 2022

CONTENTS

Florida Phosphate Mining
Florida, USA
Technical Report Summary

TABLES

FIGURES

FORWARD LOOKING INFORMATION CAUTION

All statements, other than statements of historical fact, appearing in this report constitute "forward-looking statements" within the meaning of the Private Securities Litigation Reform Act of 1995. Statements regarding results depend on inputs that are subject to known and unknown risks, uncertainties and other factors that may cause actual results to differ materially from those presented in this Technical Summary Report (Report). Forward-looking statements may include words such as "anticipate", "believe", "could", "estimate", "expect", "intend", "may", "potential", "project" or "should", Information that is forward-looking includes, but is not limited to, the following:

- Mineral resource and mineral reserve estimates.
- Assumed commodity prices and exchange rates.
- Proposed and scheduled mine production plan.
- Projected mining and processing recovery rates.
- Capital cost estimates and schedule.
- Operating cost estimates.
- Closure costs estimates and closure requirements assumptions.
- Environmental, permitting and social risk assumptions.

Additional risks to the forward-looking information include:

- Changes to costs of production from what is assumed.
- Unrecognized environmental risks.
- Unanticipated reclamation expenses.
- Unexpected variations in production tonnage, grade or recovery rates.
- Adverse weather conditions and climate change.
- Failure of plant, equipment or processes to operate as anticipated.
- Accidents, labor disputes and other risks of the mining industry.
- Changes to tax rates.
- Other material risks and uncertainties reported from time to time in the Company's reports filed with the Securities and Exchange Commission (SEC).

1.0 Executive Summary

1.1 Introduction

Florida phosphate mining consists of three active phosphate facilities (South Fort Meade, Four Corners and Wingate) and three exploration properties as defined by SEC Regulation S-K, Subpart 1300 (DeSoto, Pioneer and South Pasture), located in central Florida. Mining in central Florida started more than 130 years ago. The majority of mining currently takes place in Hardee County. Of the active mines, Four Corners and South Fort Meade are dragline mines and Wingate is a dredge mine. All of the exploration properties are planned to be dragline operations at the commencement of mining.

A facility consists of an active mining area, mine office, an operating beneficiation plant and ancillary support facilities (e.g., pipelines, electric infrastructure, clay settling areas, etc.). The facilities are staffed with Mosaic personnel and contractor employees. Mining areas include areas of progressive reclamation and active mining.

The 2022 Florida Phosphate Mining Technical Report Summary has been prepared by the Florida phosphate Qualified Persons and supports the mineral resource and mineral reserve estimates for the year ending December 31, 2022.

Mineral resources and mineral reserves are reported as a beneficiation plant product (phosphate rock) tonnage and P_2O_5 grade including a total primary impurities ratio (MER).

The mineral resources and mineral reserves are reported in accordance with SEC Regulation S-K, Subpart 1300.

1.2 Property Locations

The Florida phosphate facilities and three exploration properties are located in central Florida (Figure 1-1), in DeSoto, Hardee, Hillsborough, Manatee and Polk counties.

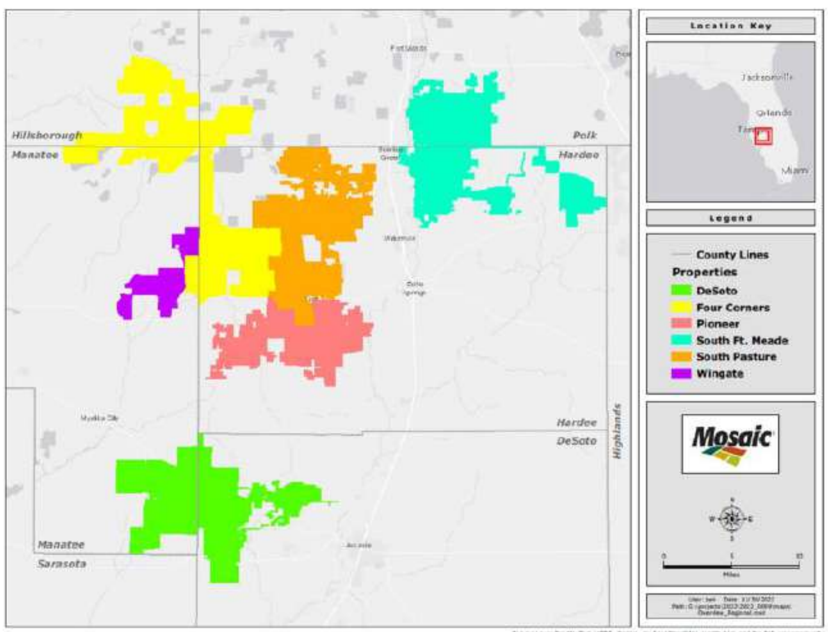


Figure 1-1: Florida Phosphate Mining Facility and Property Locations

1.3 Ownership and Status

The Florida phosphate mining facilities and properties are owned by or have controlling interest granted to Mosaic Fertilizer, LLC (Mosaic Fertilizer), South Ft. Meade Land Management, Inc. (SFMLM) or South Ft. Meade Land Partnership, L.P. (SFMLP) each a direct or indirect wholly-owned subsidiary of The Mosaic Company. For the purposes of this Report, unless otherwise noted, The Mosaic Company, Mosaic Fertilizer, SFMLM and the SFMLP will each be referred to interchangeably as Mosaic, as the context requires.

1.4 Mineral Tenure, Surface Rights, Water Rights and Royalties

Mosaic, through subsidiaries, owns or controls approximately 212,965 acres (86,184 hectares) of land in central Florida. A total of 167,823 acres (67,916 hectares) is owned fee simple and 19,035 acres (7,703 hectares) of mineral rights are owned.

Mosaic owns approximately 192,027 acres (77,711 hectares) of surface rights in central Florida. All infrastructure including the beneficiation plant and Clay Settling Areas (CSA) are located on Mosaic-owned or controlled land. Mosaic-owned land not used for operations or operational support is either leased out for agricultural or commercial use or otherwise used by Mosaic for its own agricultural use.

1.5 Geology and Mineralization

Phosphorite exists throughout the state of Florida with mineralization being nearly ubiquitous. There are, broadly speaking, two types of deposits within the state, hard rock and sedimentary. The entirety of Mosaic's mineral reserves and resources exist within sedimentary deposits. Economic phosphorite exists in a matrix of gravels, sands, silts and clays that are readily extractible. These economic deposits overlay a carbonate platform where phosphorite is absent. The bedrock and economic matrix are overlain by sands, clays and silts that are easily removed. Limitations of extraction are the ease of excavation, the capacity of the matrix to slurry, the grade of the phosphorite, gangue minerals, the depth of the matrix, and the overburden to be removed.

Deposition of phosphorite occurred in the Miocene and Pliocene epochs. The depositional environment was shallow marine with sea levels of 300 ft. (100 m) or less. Cold phosphate rich waters were upwelled and mixed with warm surface waters creating vigorous biologic activity. Biological remains settled on the sea floor in regional anoxic zones. Phosphate subsequently substituted into calcium carbonate in the form of the mineral francolite. Accessory mineralization does occur, but it is of little economic consequence. The deposit underwent transport and rework through marine winnowing. Post-depositional rework is extensive and site factors such as hydrology and groundwater geochemistry influence grade and gangue mineralization.

Gangue minerals are generally limestone, dolomitic limestone, iron concretions of varying sizes and competent clays that resist disaggregation by washing. Limestone, dolomite and iron concretions exist as distinct particles that are inseparable through conventional sizing. There is limited intracrystalline substitution of metals within francolite. Most of the gangue minerals are distinct particles.

Mosaic's Florida phosphate mining currently consists of three producing facilities and three exploration properties. The geology across all the sites is a consistent sequence of sub-aerial and marine sediments. The upper most sediments are lacking in phosphates. The marine sediments and carbonate system that follow contains an economic concentration phosphate. The lower carbonate system is devoid of phosphate. At a site level, the geology is unique enough to warrant different ore management practices based on gangue clast size, composition and concentration.

The Four Corners property geology consists of 21 to 41 ft. (6.4 to 12.5 m) of gray to white poorly graded quartz sand with varying abundance of reworked phosphate grains as waste overburden. The first economic zone is 13 to 26 ft. (4.0 to 7.9 m) of tan-gray to gray quartz sands, clays and silts with phosphate nodules and pellets present with phosphate grains and clasts predominate. There is an interbedded waste zone of 0 to 10 ft. (0.0 to 3.0 m) in thickness comprised of beds of blue to green barren sandy clays. Occasionally, there are beds of marine limestone and dolostones or marginally phosphatic sandy beds of dolomitic clasts and grains. The second economic zone is 0 to 15 ft. (0.0 to 4.6 m) of dark gray to dark gray-blue-green clays, silts with quartz sands with phosphate nodules and pellets present with phosphate grains

and clasts predominate. The phosphate grade ranges from 27 to 30% P_2O_5. The basal units are dark gray to black clays to phosphatic limestone rubble to beds of phosphatic limestone.

The South Fort Meade property geology consists of 5 to 50 ft. (1.5 to 15.2 m) of gray to white poorly graded quartz sand with varying abundance of reworked phosphate grains. The economic zone is 0 to 50 ft. (0.0 to 15.2 m) thick, ranging in grade from 30 to 40% P_2O_5 and comprised gray to gray-blue clayey sands with lineation of red, brown and white. Phosphate nodules and pellets are the dominant constituent to gray to gray-blue quartz sands, clays, and phosphate grains and some nodules. The basal units are gray to gray-blue barren clays to phosphatic limestone rubble to beds of phosphatic limestone.

The Wingate property geology consists of 35 to 49 ft. (10.7 to 14.9 m) of white to tan-gray poorly graded quartz sand to brown-gray to orange iron-cemented clayey sand hardpan to tan-gray to gray clayey sands with varying abundance of reworked phosphate grains. The economic zone is 19 to 37 ft. (5.8 to 11.3 m) thick, ranging in grade from 28 to 31% P_2O_5 and comprised of tan-gray to gray clayey sands with phosphate pellets and grains to gray to gray-blue quartz sands, clays, and phosphate grains and some nodules. The basal units are gray to gray-blue barren clays to phosphatic limestone rubble to beds of phosphatic limestone.

The South Pasture property geology consists of 17 to 37 ft. (5.2 to 11.3 m) of mostly tan-gray to gray poorly graded quartz sand with varying abundance of reworked phosphate grains. The first economic zone is 13 to 27 ft. (4.0 to 8.2 m) of tan-gray to gray-blue quartz sands, clays and silts with phosphate nodules and pellets are present with phosphate grains and clasts predominate. There is an interbedded waste zone of 0 to 13 ft. (0 to 4.0 m) in thickness comprised of beds of blue to green barren sandy clays. Occasionally beds of marine limestone and dolostones or marginally phosphatic sandy beds of dolomitic clasts and grains. The second economic zone is 0 to 14 ft. (0.0 to 4.3 m) of dark gray to dark gray-blue-green clays, silts with quartz sands with phosphate nodules and pellets present with phosphate grains and clasts predominate. The phosphate grade ranges from 29 to 33% P_2O_5. The basal units are dark gray to black clays to phosphatic limestone rubble to beds of phosphatic limestone.

The DeSoto property geology consists of 18 to 32 ft. (5.5 to 9.8 m) of gray to white poorly graded quartz sand with varying abundance of reworked phosphate grains. The economic zone is 11 to 28 ft. (3.4 to 8.5 m) thick, ranging in grade from 29 to 35% P_2O_5 and comprised of tan-gray to gray clay-rich sands with phosphate pellets and grains. The basal units are gray to gray-blue barren clays to phosphatic limestone rubble to beds of phosphatic limestone.

The Pioneer property geology consists of 21 to 45 ft. (6.4 to 13.7 m) of gray to tan poorly graded quartz sand with varying abundance of reworked phosphate grains. The economic zone is 14 to 38 ft. (4.3 to 11.6 m) thick, ranging in grade from 26 to 33% P_2O_5 and comprised of tan-gray to gray to gray-blue quartz sands, silts and clays with phosphate pellets and grains. The basal units are gray-green to dark gray barren clays to phosphatic limestone rubble to beds of phosphatic limestone.

1.6 Mineral Resource Estimates

The mineral resource estimates for Mosaic's holdings are listed in Table 1-1. Mineral resources are reported exclusive of the mineral reserves.

Figures 1-2 to 1-7 show the distribution of the mineral resources and mineral reserves for the Florida phosphate mining facilities and exploration properties.

Table 1-1: 2022 Mineral Resources

Location	Measured Mineral Resources				Indicated Mineral Resources				Measured + Indicated Mineral Resources				Inferred Mineral Resources			
	Tons (M)	Tonnes (M)	$\%P_2O_5$	MER	Tons (M)	Tonnes (M)	$\%P_2O_5$	MER	Tons (M)	Tonnes (M)	$\%P_2O_5$	MER	Tons (M)	Tonnes (M)	$\%P_2O_5$	MER
DeSoto Property	0	0	0.0	0.0	156	142	30.5	10.7	156	142	30.5	10.7	67	61	30	10
Pioneer Property	19	17	31.1	9.3	136	123	30.4	10.4	154	140	30.5	10.3	21	19	30	10
South Pasture Property	94	85	29.7	10.4	165	150	29.4	10.9	259	235	29.5	10.7	4	3	30	10
Total	**113**	**102**	**30.0**	**10.2**	**457**	**415**	**30.1**	**10.7**	**569**	**517**	**30.0**	**10.6**	**92**	**83**	**30**	**10**

Notes to accompany mineral resource table:

1. Mineral resource estimates were prepared by QP Kevin Farmer, a Mosaic employee.
2. Mineral resources are reported as a beneficiation plant product (phosphate rock) tonnage and P_2O_5 grade including a total primary impurities ratio (MER).
3. Mineral resources have an effective date of December 31, 2022.
4. Mineral resources are reported exclusive of those mineral resources that have been converted to mineral reserves.
5. Mineral resources that are not mineral reserves do not have demonstrated economic viability.
6. Mineral resources are not mineral reserves and do not meet the threshold for mineral reserve modifying factors, such as estimated economic viability, that would allow for conversion to mineral reserves. There is no certainty that any part of the mineral resources estimated will be converted into mineral reserves.
7. Mineral resources assume dragline mining at all sites except Wingate Mine where dredging is assumed.
8. Mineral resources amenable to a dragline mining method are contained within a conceptual mine pit design using the same technical parameters as used for mineral reserves.
9. The cut-offs used to estimate mineral resources by site include, the minimum beneficiation plant concentrate BPL ($\%P_2O_5$), minimum pebble BPL ($\%P_2O_5$), maximum pebble magnesium oxide concentration and a maximum clay content cut-off for a logged matrix layer and the composite matrix volume (Section 11.2).
10. Impurities are reported as MER ((Fe + Al + Mg)/P_2O_5 x 100).
11. Tonnage estimates are in US Customary and metric units and are rounded to the nearest million tonnes.
12. Rounding as required by reporting guidelines may result in apparent summation differences.
13. A commodity price of US$102.72/tonne of phosphate rock was used to assess prospects for economic extraction but is not used for cut-off purposes.

1.7 Mineral Reserve Estimates

The mineral reserve estimates for Mosaic's holdings are listed in Table 1-2.

Figures 1-2 to 1-7 show the distribution of the mineral resources and mineral reserves for the mining facilities and properties. Mineral reserves are sub-divided into two confidence categories in Regulation S-K 1300, proven and probable.

Table 1-2: 2022 Mineral Reserves

Location	Proven Mineral Reserves				Probable Mineral Reserves				Total Mineral Reserves			
	Tons (M)	Tonnes (M)	$\%P_2O_5$	MER	Tons (M)	Tonnes (M)	$\% P_2O_5$	MER	Tons (M)	Tonnes (M)	$\% P_2O_5$	MER
South Fort Meade Facility	8	7	27.0	10.9	34	31	26.4	7.3	42	38	26.5	8.04
Four Corners Facility	41	37	28.1	10.0	34	30	27.6	10.7	74	67	27.9	10.3
Wingate Facility	13	11	28.3	8.6	9	8	27.8	10.2	22	20	28.1	9.3
Total	**61**	**56**	**28.0**	**9.8**	**77**	**70**	**27.1**	**9.4**	**138**	**126**	**27.5**	**9.6**

Notes to accompany mineral reserves table:

1. Mineral reserve estimates were prepared by QP Kevin Farmer, a Mosaic employee.
2. Mineral reserves have an effective date of December 31, 2022.
3. Mineral reserves are based on measured and indicated mineral resources only.
4. Mineral reserves are reported as a beneficiation plant product (phosphate rock) tonnage and P_2O_5 grade including a total primary impurities ratio (MER).
5. South Fort Meade and Four Corners mineral reserves are mined by a dragline mining method. The Wingate mineral reserves are mined by dredge mining.
6. Cut-off based on productivity factors per site have been applied to estimate mineral reserves (Section 12.2).
7. Impurities are reported as MER $((Fe + Al + Mg)/P_2O_5 \times 100)$.
8. Mine designs are used to constrain mineral reserves within mineable pit shapes.
9. Only after a positive economic test and inclusion in the Life of Mine Plan are the mineral reserve estimates considered and disclosed as mineral reserves.
10. Tonnage estimates are in US Customary and metric units and are rounded to the nearest million tonnes.
11. Rounding as required by reporting guidelines may result in apparent summation differences.
12. A commodity price of US$102.72/tonne of phosphate rock was used to assess the economic viability of the mineral reserves in the LOM.

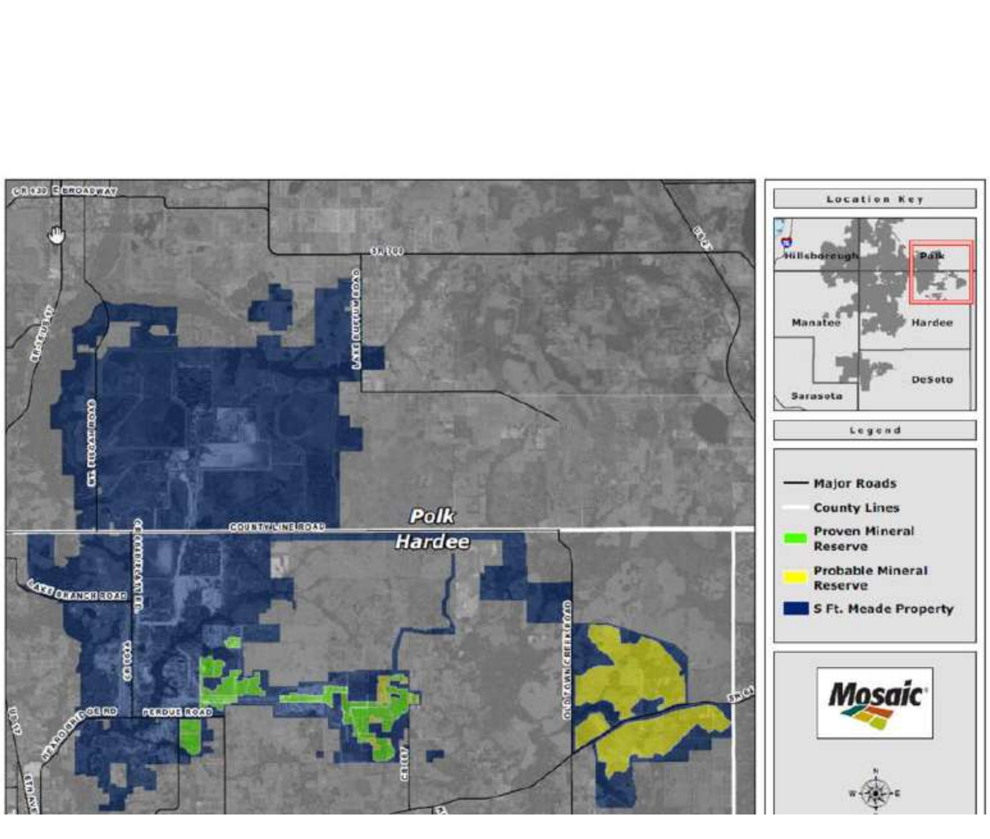


Figure 1-2: South Fort Meade Facility Mineral Reserves

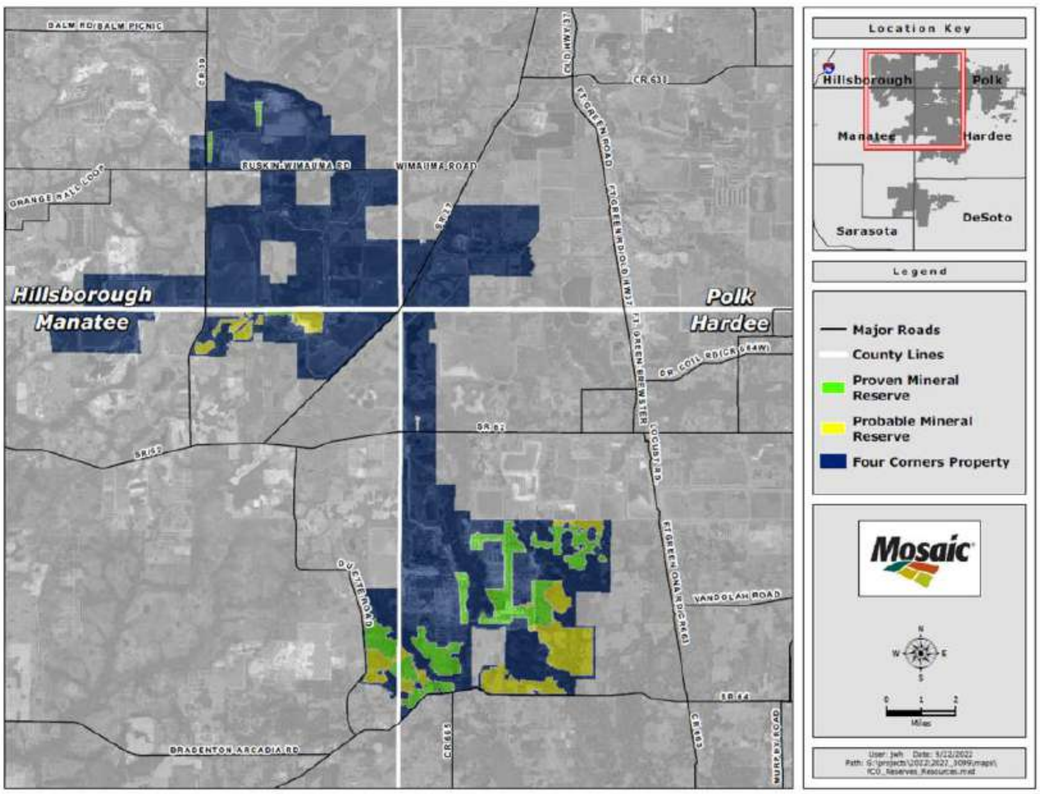
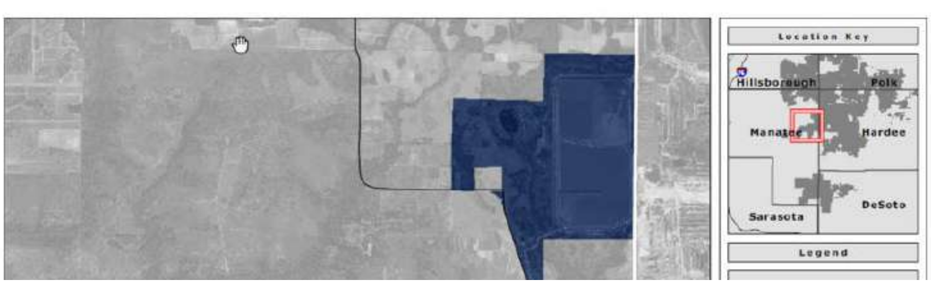


Figure 1-3: Four Corners Facility Mineral Reserves



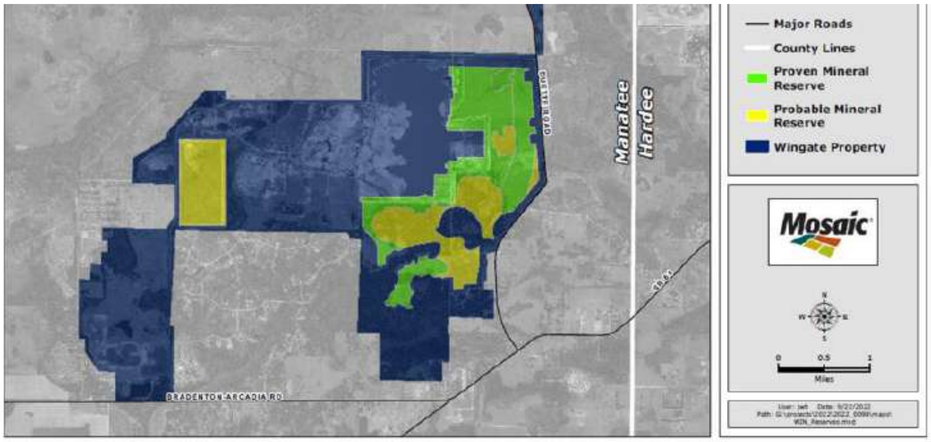


Figure 1-4: Wingate Facility Mineral Reserves

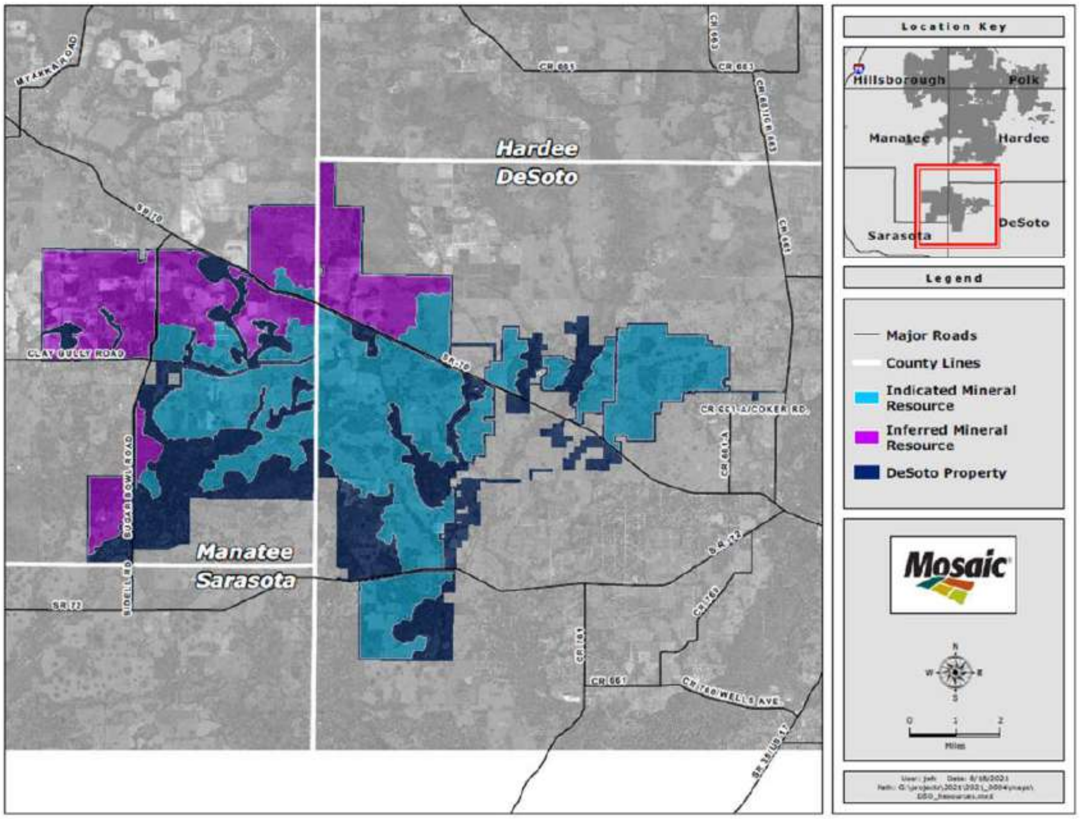


Figure 1-5: DeSoto Property Mineral Resources

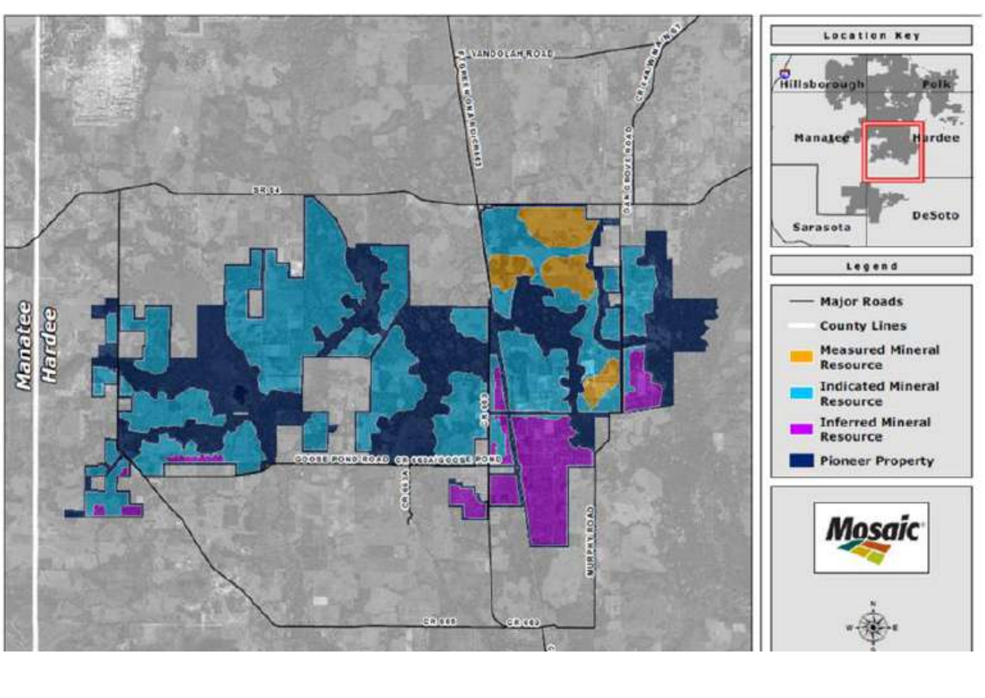


Figure 1-6: Pioneer Property Mineral Resources

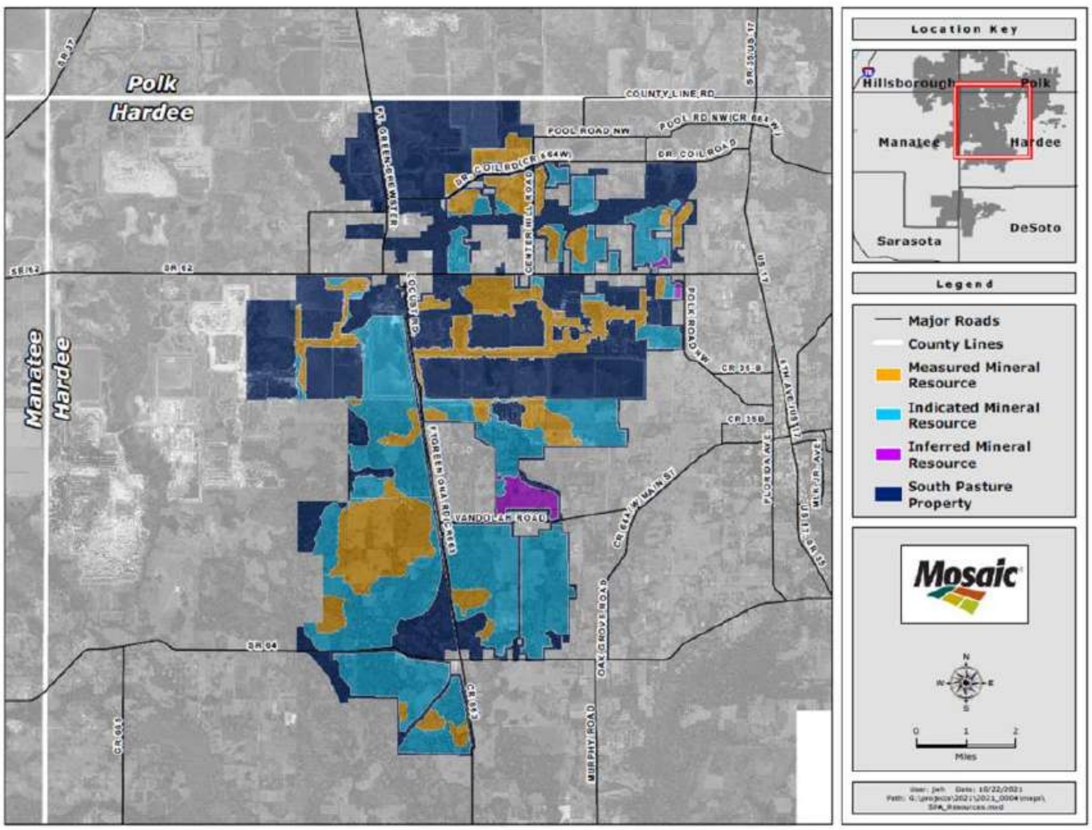


Figure 1-7: South Pasture Property Mineral Resources

1.8 Mining Methods

Mosaic's mining operations in central Florida extract phosphate using surface mining techniques. The active mines utilize either electric walking draglines or dredges to remove the overburden and mine the phosphate ore (matrix). The matrix is hydraulically transported via multiple series, centrifugal pumping systems to the beneficiation plant.

Pre-mining development follows the issuance of regulatory permits. This involves ditch and berms for stormwater control, groundwater draw down mitigation where applicable, land clearing, installation of infrastructure and pre-mining dewatering (only for dragline mining).

Development of the mine plan is based on several factors, including geological data, equipment, property boundaries, geotechnical considerations, clay impoundment, reclamation schedule, production (volume and quality) demands, permits (local, state and federal) and agreements. Production is monitored through dragline/dredge monitoring systems, mass-flow instrumentation on slurry pumping systems and pit surveys. In addition to draglines and dredges, heavy mobile equipment is used to support mining activities. While each mine is staffed with Mosaic personnel to handle mobile equipment is used to support mining activities. While each mine is staffed with Mosaic personnel to handle production and maintenance, contractors are used on an as needed-basis.

1.9 Recovery Methods

Phosphate matrix mined at the three active facilities is processed through onsite beneficiation plants. The principal production components of Florida beneficiation plants consist of a washer, sizing and flotation plant.

The washer separates >1.0 mm phosphate product and the <1.0 mm slurry of liberated clay, sand and phosphate particles. The clay is removed with hydrocyclones and pumped to clay settling areas while the >0.1 mm sand and phosphate move on to the Sizing section.

The >0.1 mm sand and phosphate is separated into different size fractions using hydrosizers. An upward flow of water is injected into the hydrosizer that force the fine particles to rise and overflow the sizer, while the coarse particles gently fall and flow out the sizer's underflow. The segregated fine and coarse particles are then sent to the Flotation Plant so the phosphate can be separated from the sand.

The two-step Crago flotation process (rougher flotation and cleaning flotation) is next utilized to separate phosphate from the sand. In the rougher flotation process, the phosphate mineral is recovered using flotation machines by adding fatty acid, oil, soda ash and sodium silicate. To increase the recovered rougher phosphate grade, a second cleaning flotation process is used to remove the residual sand using amine.

1.10 Infrastructure

The three Florida phosphate mining facilities are situated in rural central Florida, and in close proximity to populated areas. They are located southeast of Tampa in Hillsborough, Polk, Hardee and Manatee Counties. The sites are located in agricultural zones with associated population centers and easy access to multiple transportation hubs in central Florida.

The phosphate facilities have the infrastructure in place to meet the current production plans and long-range production goals. The current infrastructure includes major roads and highway access, railway support from CSX and supplied electricity by Duke Energy, Tampa Electric Company (TECO), Peace River Electric Cooperative, Inc. (PRECO), Florida Power and Mosaic cogeneration in associated distribution areas. Water supply is from Mosaic-owned deep wells and recycle sources. Current clay and tailings management areas footprint is expected to meet current demands with additional capacity planned to meet the maximum volume and deposition rates in the Life of Mine (LOM) plan, which covers the period between 2023 and 2035.

Additional infrastructure may be added to increase reliability of the existing product lines or add some additional production flexibility. The assets currently in place are maintained through a robust workflow process that focuses on proactive inspections and preventative maintenance while trying to minimize reactive maintenance.

The sites are expected to continue to operate effectively while continuing to maintain the built infrastructure and renewing the long-term agreements in place for the sites' water, electricity and logistics needs. The long-term clay and sand tailings management area plan is in place to support the production at the levels indicated in the LOM plan.

A focus on reliability centered maintenance will extend the life of the majority of assets to align with the LOM plan. It is expected that some infrastructure will need to be replaced as it reaches end of life. This has been factored into the capital cost requirements.

1.11 Markets and Contracts

The open pit mining and beneficiation practices at the Florida mines result in a phosphate rock product with a grade of ~62% BPL (~28.5% P_2O_5) and is amendable as feedstock for phosphoric acid (and downstream high-analysis phosphate end-products). The phosphate rock concentrate is consumed internally at downstream phosphate production facilities to make finished products including phosphate fertilizers and animal feed phosphates.

There is no quoted benchmark for phosphate rock in Florida (nor elsewhere in the United States). The CRU International Limited (CRU) forecast finished product price was utilized as the basis to calculate a gross margin available to fund the upstream mining and processing of phosphate rock. The gross margin available for Florida Phosphate mining was calculated as $135 per tonne.

The global market for phosphate rock is estimated to be approximately 205 M tonnes in 2022 and has grown at a compound annual growth rate of around 2% over the past two decades, though growth has slowed to circa 1% per annum over the past several years. Going forward, global phosphate rock demand growth is expected to continue to grow, with Mosaic and independent analysts typically projecting a growth rate of 1-2% per annum. This growth ensures sufficient market demand for continued production at Mosaic's Florida phosphate mines.

1.12 Environmental, Permitting and Social Considerations

All Florida phosphate mining facilities and exploration properties operate or will operate pursuant to federal, state and local environmental regulations. Accordingly, permits, licenses and approvals are obtained specific to each site, based on project specific requirements. Mosaic also has routine interactions with government officials and agencies related to agency inspections, permitting and other environmental matters. The information as supplied regarding the management of all environmental aspects, permitting and social considerations at Mosaic facilities is guided by Mosaic's Environmental, Health and Safety Policy, management system of programs and procedures, and current permit, legal and regulatory requirements.

1.13 Capital Cost and Operating Cost Estimates

Capital for the Four Corners, South Fort Meade and Wingate facilities' 2023 LOM plan (2023 to 2035) and 2022 mineral reserves is estimated at US$1.62 B. The capital cost estimate includes mine, beneficiation plant, loading, maintenance, mobile equipment, land management and regulatory capital.

Operating costs for the Four Corners, South Fort Meade and Wingate facilities 2023 LOM plan (2023 to 2035) and 2022 mineral reserves is estimated at US$5.29 B. This includes mining cash costs (mining, beneficiation plant, maintenance and direct overhead costs), other operating costs (central and functional overhead allocated costs) and royalties and other government levies or interests including severance taxes, royalties, and excluding income taxes. The operating cost forecasts are based on a combination of historical performance and calculations from first principles to take account variation in production rates and expected process improvements.

1.14 Economic Analysis

The financial models that support the mineral reserve and mineral resource declarations are standalone models that calculate annual cash flows based on scheduled ore production, assumed processing recoveries, commodity sale prices, projected operating and capital costs and estimated taxes along with anticipated closure and reclamation costs.

The net present value analysis of the 2023 LOM plan mineral reserves indicates that there is significant economic value associated with mining the mineral reserves at the Four Corners, South Fort Meade and Wingate facilities, given the economic assumptions and operating parameters considered. By setting up the after-tax net present value to US$0, utilizing a discount rate of 9.0%, the required internal transfer price of rock is $68/tonne, which is the minimum price needed to achieve a return equal to cost of capital (discount rate). The price calculated is well below the gross margin available for rock of $135/tonne. A sensitivity analysis of the financial model by varying commodity price, total operating cost and total capital cost indicates that the financial results for the Four Corners, South Fort Meade and Wingate facilities are robust and considered low risk.

The economic analysis of the DeSoto, Pioneer and South Pasture properties mineral resources indicates that there is positive economic value associated with the possible mining of the mineral resources based on the reasonable economic and operating assumptions considered. The economic assessments reflect a solid margin between LOM forecast gross margin available and internal transfer price and support reasonable prospects of economic extraction and the reporting of the mineral resources.

1.15 Interpretations and Conclusions

Under the assumptions and technical data outlined in this Technical Report Summary, the Florida phosphate mining 2023 LOM plan utilizing South Fort Meade, Four Corners and Wingate facilities mineral reserves only, shows that the minimum price needed inferred by setting to USD$0 the net present value of after-tax cash flow discounted to cost of capital, is well below the current margin available for rock. The economic assessment of the DeSoto, Pioneer and South Pasture properties' mineral resources supports reasonable prospects of economic extraction and the reporting of the mineral resources.

These economic assessments support the 2022 SEC Regulation S-K, Subpart 1300 disclosure of the Florida phosphate mining mineral resource and mineral reserve estimates.

1.16 Recommendations

The following recommendations for additional work are focused on improving and maintaining important mineral resource and mineral reserve estimation processes.

- Mosaic will continue to investigate and consider new innovations in phosphate mining and processing technology.
- A thorough production reconciliation process will be considered to further improve and support the mineral resource and mineral reserve estimates. Sample and measuring points will be revisited and assessed.
- The current exploration plan will be further refined to better define future opportunities for mineral resource and mineral reserve expansion.
- Mosaic will consider increasing the drilling density in the indicated and inferred mineral resource areas.
- Investigate new technology to improve the efficiency of core sample processing and sample tracking.
- A more robust modeling software for mineral resource estimates will be considered.
- Investigate the use of optimization processes for improving mineral resource limits.
- The process of acquiring additional land adjacent to the operating mines should continue as this adds mineral resources and mineral reserves to the LOM plan.
- More samplers at the beneficiation plants would help monitor the flotation performance for each circuit.
- Completion of plant step tests are recommended to evaluate changes in the minerology or verify correct setpoints when draglines have moved to a new area.

2.0 Introduction

2.1 Registrant

The 2022 Florida Phosphate Mining Technical Report Summary has been prepared by the phosphate Qualified Persons for The Mosaic Company headquartered in Tampa, Florida, USA.

2.2 Purpose and Terms of Reference

The Report was prepared to support the mineral resource and mineral reserve estimates for the year ending December 31, 2022.

The mineral resources and mineral reserves are reported in accordance with SEC Regulation S-K, Subpart 1300.

For the purposes of this Report, unless otherwise noted, The Mosaic Company will be referred to as Mosaic. Florida phosphate mining includes and refers to three active facilities (South Fort Meade, Four Corners and Wingate) and their respective beneficiation plants, and three exploration properties (DeSoto, Pioneer and South Pasture).

Where practicable, measurement units used are US Customary units with metric unit conversions included. US Customary units are used in this Report when discussing the mining and processing facilities, including equipment capacities, pumping rates and equipment capacities. Some analytical results are also reported using US Customary units.

2.3 Abbreviations and Units

Table 2-1: List of Units and Abbreviations

B	billion(s)	IWUP	Integrated water use permit
BPL	Bone Phosphate of Lime	km	kilometer(s)
°C	degree Celsius	kV	kilovolt
cm	centimeter	kW	kilowatt
CSA	clay settling areas	lbs.	pound(s)
CSX	CSX Corporation	LiDAR	Light Detection and Ranging
EA	Environmental Assessment	LOM	Life of Mine
E/I	Electrical & Instrumentation	m	meters
		M	million(s)
EIS	Environmental Impact Statement	MER	Minor Element Ratio
EMP	Environmental Management Plan	NPV	net present value

EPA	Environmental Protection Agency
°F	degree Fahrenheit
Fcast.	forecast
ft.	foot, feet
FOB	Freight On Board
gal	US gallon
GIS	Geographical Information System
GMA	Gross Margin Available
US gpm	US gallon per minute
hp	Horsepower
HDPE	High-density polyethylene
IP	Intermediate pebble
ISA	Initial Settling Area
ITP	Internal Transfer Price

P_2O_5	Phosphorus pentoxide
P. Eng.	Professional Engineer
P. Geo.	Professional Geoscientist
PLS	Product Loading System
psi	pounds per square inch
QA	Quality assurance
QC	Quality control
QP	Qualified Person(s)
SAP	Enterprise software to manage business operations and customer relations
SEC	United States Securities and Exchange Commission
SGS	Inspection, verification, testing and certification company
SWFWMD	Southwest Florida Water Management District
SPTs	Soil penetration tests

tonnes	metric tonnes (2,204 lbs.)
tons	US Customary short tons (2,000 lbs.)
tons/hour	short tons per hour (US)
tons/year	tons per year (US)

US$	United States dollar(s)
USGS	United States Geological Survey
V	volt(s)

2.4 Qualified Persons (QP)

Table 2-2 outlines the people that served as Qualified Persons (QPs) for the Florida Phosphate Mining Technical Report Summary as defined in SEC Reg. S-K, Subpart 1300.

Table 2-2: Qualified Persons

QP Name	Company	Qualification	Position/Title	Site Visit / Inspection Dates	Section of Responsibility
Kevin Farmer	Mosaic Company	SME Registered Member #4207068	Superintendent Mine Planning	Full time Florida Phosphate employee	6, 7, 8, 9, 11, 12
Gonglun Chen	Mosaic Company	Ph.D., Professional Engineer Florida #73937	Engineer Advisor	Full time Florida Phosphate employee	10, 14
Tyler Wright	Mosaic Company	Professional Engineer Florida #78507	Superintendent of Production	Full time Florida Phosphate employee	15
Brian Ball	Mosaic Company	Professional Engineer Florida License #75165	Director, Mine Strategy	Full time Florida Phosphate employee	13, 16, 18, 19
Bethany Niec	Mosaic Company	Professional Engineer Florida License #68437	Senior Manager, Environmental	Full time Florida Phosphate employee	17.1, 17.2, 17.3, 17.8, 17.9
Scott Wuitschick	Mosaic Company	Professional Engineer Florida License #54648	Director Geotech Ops, Water Management, Idle Plants	Full time Florida Phosphate employee	17.4, 17.5, 17.6, 17.7

2.5 Effective Dates

There are a number of effective dates:

- Date of the mineral resource estimates: December 31, 2022.
- Date of the mineral reserve estimates: December 31, 2022.
- Date of supply of the most recent information on mineral tenure and permitting: December 2022.
- Date of capital estimation: September 2022.
- Date of operating cost estimation: September 2022.
- Date of reclamation cost estimate: September 2022.
- Date of economic analysis: December 31, 2022.

The overall effective date of the Report is taken to be the date of the mineral resource and mineral reserve estimates and is December 31, 2022.

2.6 Information Sources and References

The report listed in Table 2-3 and Section 24.0 (References) of this Report was used to support the preparation of this Report.

Table 2-3: Reliance on Other Experts

Expert	Title	Topic	Supporting Section	Date Received
Burns & McDonnell Engineering Co.	Site Closure Plan South Fort Meade Facility	Site Closure Plan	17	August 8, 2021

2.7 Previous Technical Report Summaries

A previous Technical Report Summary for Florida phosphate mining was submitted effective December 31, 2021.

3.0 Property Description

3.1 Introduction

Mosaic's three phosphate facilities and three exploration properties are located in central Florida (Figure 3-1) in DeSoto, Hardee, Hillsborough, Manatee and Polk counties. Even though property acquisition is an ongoing activity, most of the property currently being mined or planned for future mining has been in industry ownership for over 50 years.

The South Fort Meade Facility is located in Polk and Hardee counties. Most of the 41,524 acres (16,804 hectares) of property associated with this mine straddle the county line along County Line Road beginning 1.3 miles (2 km) east of the City of Bowling Green and continuing another 5 miles (8 km). This facility has been in operation since 1995 (Figure 3-2).

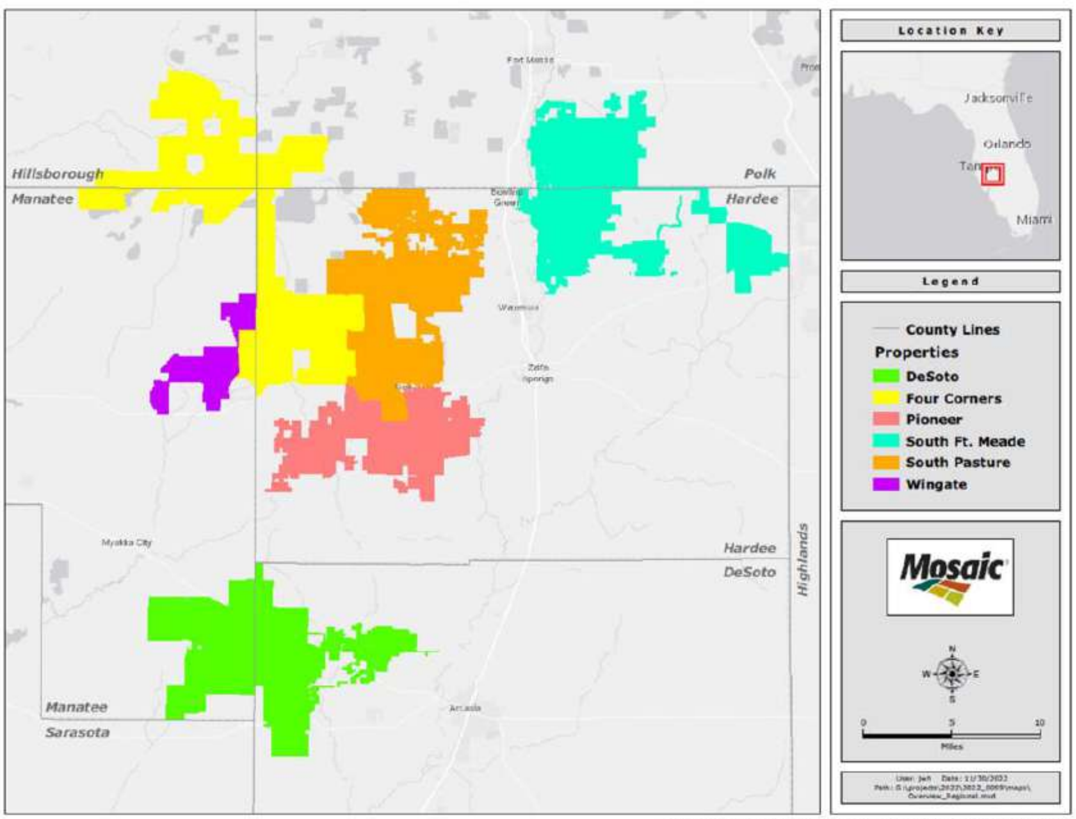
The Four Corners Facility, as the name implies, is in and around the intersection of four counties (Hardee, Hillsborough, Manatee and Polk). The 54,671 acres (22,124 hectares) of property associated with this mine exist in southeast Hillsborough County, northeast Manatee County, northwest Hardee County and southwest Polk County (Figure 3-3).

The Wingate Facility is wholly-located in eastern Manatee County. Most of the 8,761 acres (3,545 hectares) of property associated with this mine are west of Duette Road and north of State Road 64. There is a portion of this property that exists on the east side of Duette Road that begins approximately 3 miles (4.8 km) north of State Road 64 (Figure 3-4). This facility has been in operation off and on since 1981.

The South Pasture property is wholly-located in northwest Hardee County. The 38,273 acres (15,671 hectares) of property associated with this mine, occur along a 10 mile (16 km) stretch of State Road 64 and a seven mile stretch along Country Road 663. All parcels are bisected by County Road 663, State Road 62, State Road 64 and several local roads (Figure 3-7). The mining and beneficiation activities at this location have been idled.

The DeSoto property is located in northwest DeSoto County and southeast Manatee County. The 43,064 acres (17,427 hectares) of property associated with this future mine site is bisected by State Road 70 and State Road 72 running east and west and the county line running north and south. A portion of the DeSoto property is owned fee simple and the mining interests on the remaining portion are secured by mineral rights (Figure 3-5).

The Pioneer property is located wholly in northwest Hardee County south of State Road 64. The 26,017 acres (10,529 hectares) of property associated with this future mine site is bisected by County Road 663 running north and south. Several local roads (Murphy, Bridges, Bennett and Post Plant) criss-cross this parcel (Figure 3-6).



Service Layer Credits: Esri, HERE, Garmin, (c) OpenStreetMap contributors, and the GIS user community

Figure 3-1: Florida Phosphate Property Locations

3.2 Properties and Title

3.2.1 Mineral Title

The Florida phosphate mining facilities and properties are owned by or have controlling interest granted to Mosaic Fertilizer, LLC (Mosaic Fertilizer), South Ft. Meade Land Management, Inc. (SFMLM) or the South Fort Meade Land Partnership (SFMLP) all of which are wholly owned subsidiaries of The Mosaic Company.

In Florida, the Public Land Survey System is the method used to divide Florida into one-square-mile sections for land grid purposes. Township lines are established six miles apart from south to north and range lines are established 6 miles (9.6 km) apart east to west starting at the Tallahassee Meridian located in Leon County, Florida. This frames a 6 mile (9.6 km) by 6 mile (9.6 km) township grid, containing 36 one square mile (approximately 640 acre) sections. Sections can be further subdivided into fractions (i.e., half and quarter) of parcels and land described as such are called fractional descriptions. A parcel of land may also be described by metes and bounds but this description is tied to a certified section corner recorded in the Florida Division of State Lands.

In Florida, each land parcel is assigned a parcel ID number used for appraisal and taxing. Each county in Florida adopts its own numerical system for these parcel IDs. Each parcel boundary is based on the legal description (metes and bounds and/or fractional) in the property deed that is recorded in county's Clerk of Courts official records. Any title encumbrances, amendments, and/or conveyances are to be recorded in said Clerk's office under this parcel number. This information is accessible in digital or hard copy form from each respective County Clerk's office to anyone that is interested. Requests for title examination are made to a private title company or attorney that researches these records and issues a report on their findings. For many parcels, the subsurface mineral rights are not severed from surface rights. Mosaic either owns or has controlling interest in the mineral rights to the current and future facilities.

Table 3-1 summarizes the Florida phosphate mining property status and acreages. Table 3-2 summarizes the land owned by Mosaic comprising Mosaic Florida phosphate mining.

Figures 3-2, 3-3, 3-4, 3-5, 3-6 and 3-7 show the location and distribution of the property status for the three facilities and three exploration properties.

Within the total acreage owned by Mosaic, SFMLM or SFMLP are parcels of land with less than 100% of the mineral interest. These entities own the necessary mineral interests to mine the area shown.

Table 3-1: Florida Phosphate Properties Status and Acreages

Location	Status (Acres)					Status (Hectares)				
	Fee Simple	Mineral Rights	Mining Agreement	Lease	Total	Fee Simple	Mineral Rights	Mining Agreement	Lease	Total
South Fort Meade Facility	15,333	92	25,528	571	41,524	6,205	37	10,331	231	16,804
Four Corners Facility	54,671				54,671	22,125				22,125
Wingate Facility	8,761				8,761	3,545				3,545
DeSoto Property	24,113	18,943	8		43,064	9,758	7,666	3		17,427
Pioneer Property	26,017				26,017	10,529				10,529
South Pasture Property	38,928				38,928	15,754				15,754

Total	**167,823**	**19,035**	**25,536**	**571**	**212,965**	**67,916**	**7,703**	**10,334**	**231**	**86,184**

Table 3-2: Land Ownership

Property	Acreage	
	Acres	Hectares
South Fort Meade Facility	40,953	16,573
Four Corners Facility	54,671	22,125
Wingate Facility	8,761	3,545
DeSoto Property	43,064	17,427
Pioneer Property	26,017	10,529
South Pasture Property	38,928	15,754
Total	**212,394**	**85,953**

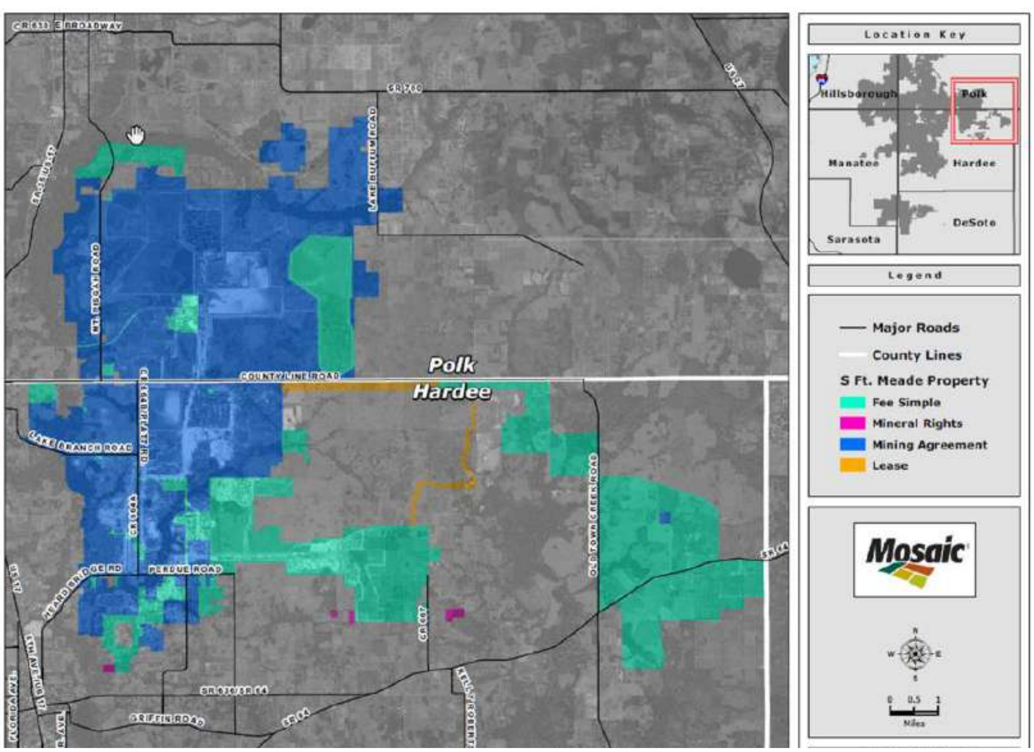


Figure 3-2: South Fort Meade Facility Property Status and Location

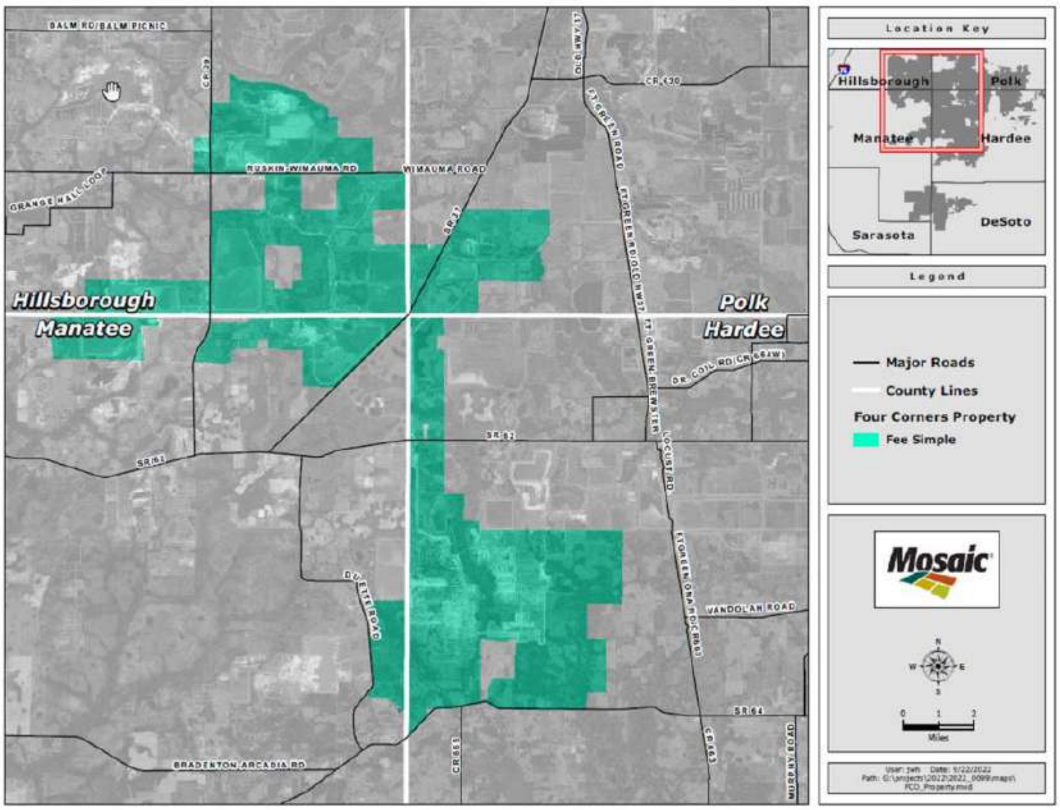


Figure 3-3: Four Corners Facility Property Status and Location

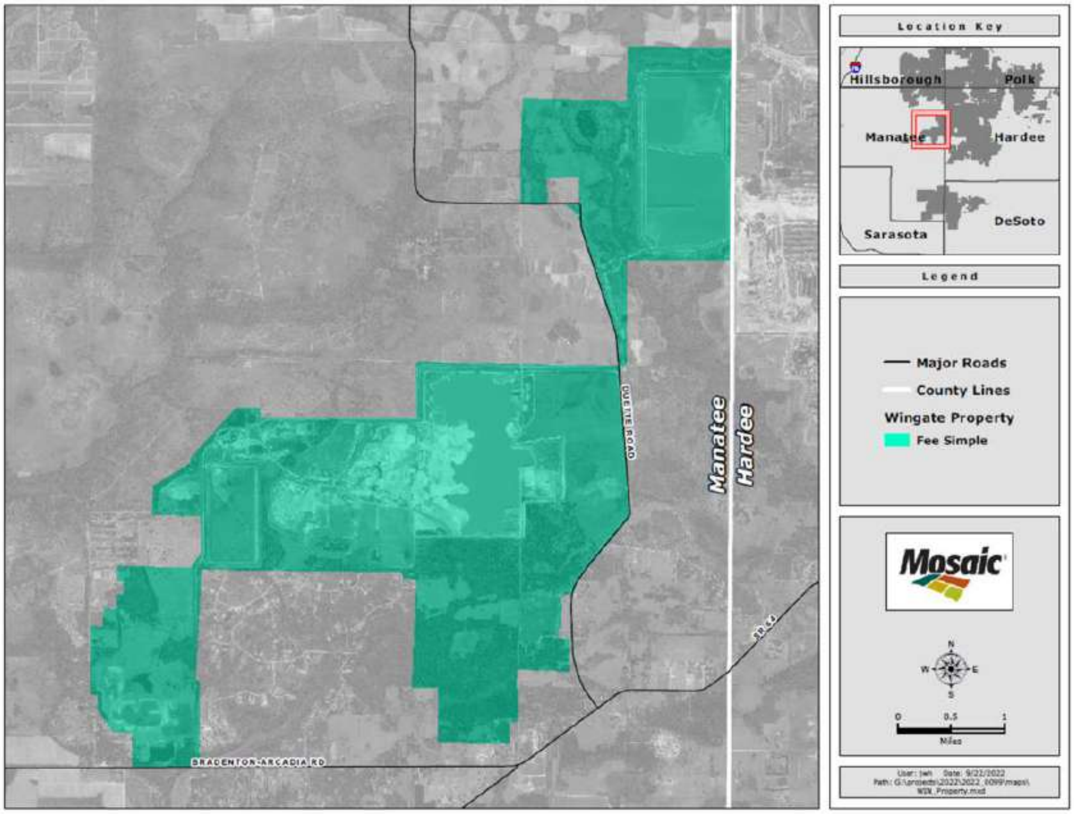
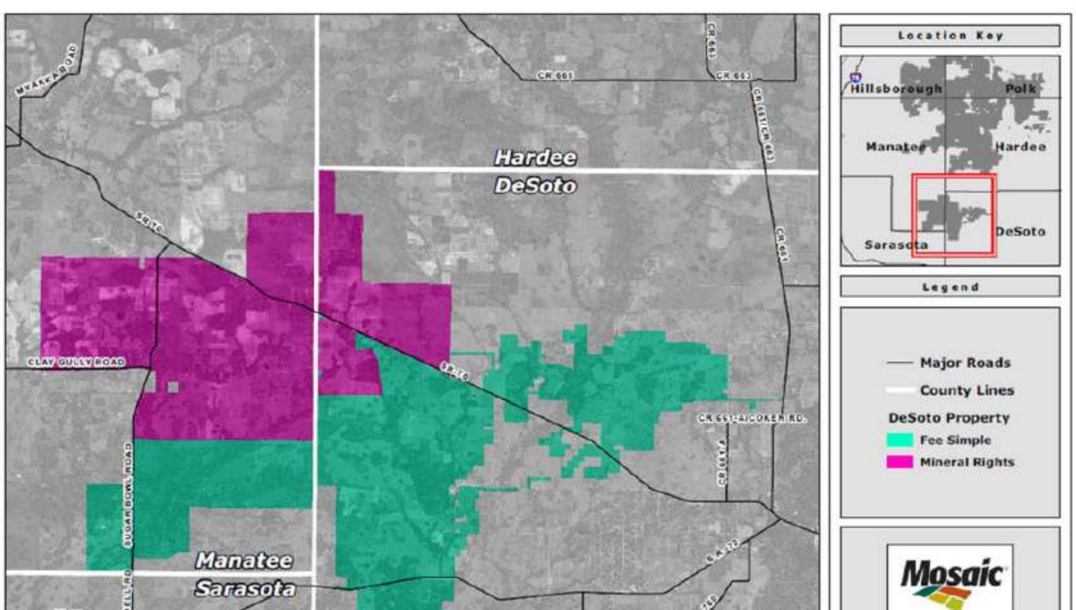


Figure 3-4: Wingate Facility Property Status and Location



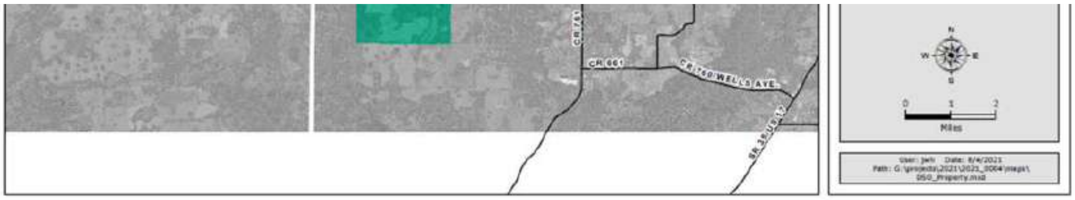


Figure 3-5: DeSoto Property Status and Location

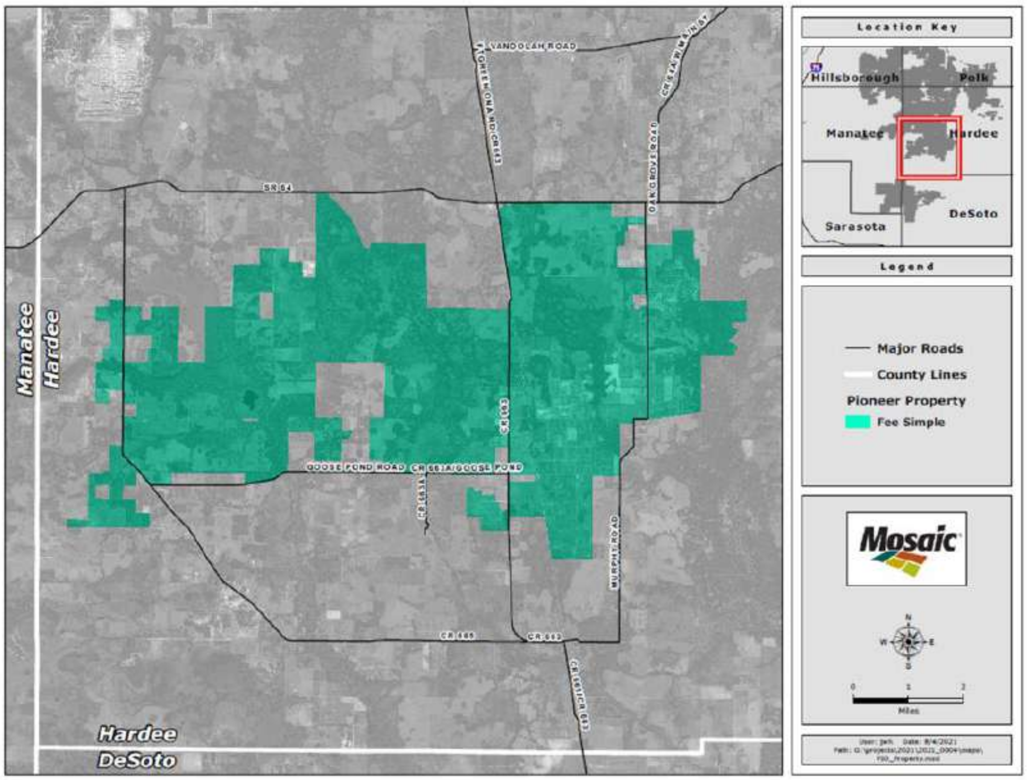


Figure 3-6: Pioneer Property Status and Location

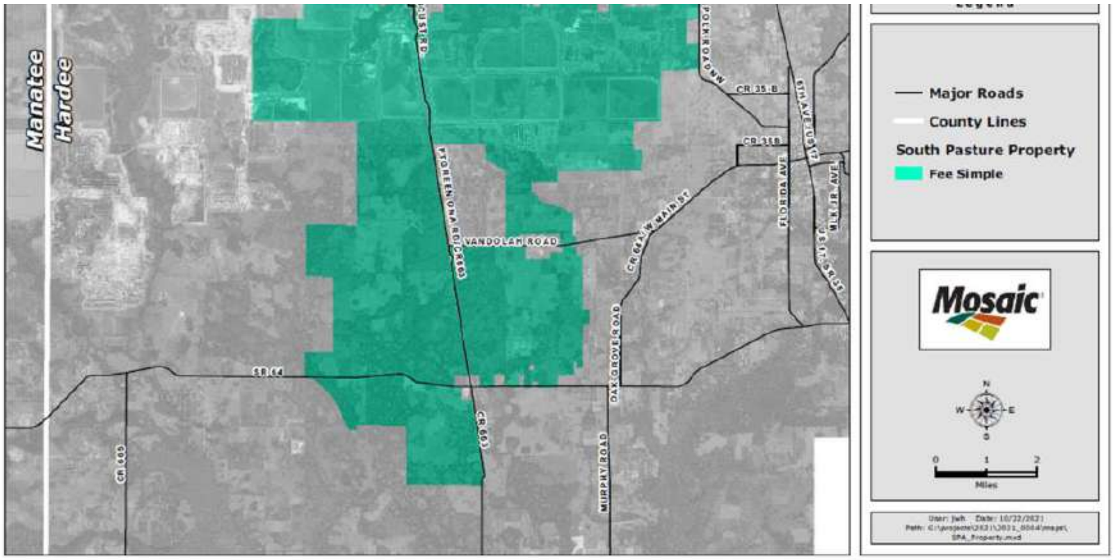


Figure 3-7: South Pasture Property Status and Location

3.2.2 Surface Rights

In Florida, surface rights are the same ownership and title as subsurface mineral rights unless they are severed. In other words, the mineral interest must be severed from the surface rights for there to be a difference. The severance must be documented in the public records as discussed in Section 3.2.1. In cases where Mosaic owns the surface rights, it is generally an indication that surface and mineral rights have not been severed. There are instances on Mosaic-controlled holdings where Mosaic does not own the surface rights but does own the mineral rights. Mineral and surface rights are joined at the Four Corners, Wingate, Pioneer and South Pasture Properties. Portions of the DeSoto Property and South Fort Meade Facility have the surface and mineral interests severed. Table 3-3 outlines the surface rights ownership by Mosaic.

Table 3-3: Property Surface Rights

Property	Surface Rights Acreage	
	Acres	Hectares
South Fort Meade Facility	39,537	16,000
Four Corners Facility	54,671	22,125
Wingate Facility	8,761	3,545
DeSoto Property	24,113	9,758
Pioneer Property	26,017	10,529
South Pasture Property	38,928	15,754
Total	**192,027**	**77,711**

3.2.3 Water Rights

The integrated water use permit (IWUP) issued by the Southwest Florida Water Management District (SWFWMD) in 2012 authorizes the withdrawal of groundwater from underground aquifers through permitted wells to provide potable and production-water supplies in support of mining and other operations. The IWUP addresses all of Mosaic's active mining operations. A separate water use permit (WUP) was issued by SWFWMD for the South Pasture property in 2017. The IWUP and the South Pasture WUP also regulate mine dewatering to avoid adverse impacts to wetlands and offsite properties. Both the IWUP and the WUP are 20-year permits expiring in 2032 and 2037, respectively.

3.2.4 Royalties

There are no current royalty obligations for Florida phosphate mining.

3.3 Encumbrances

There are no significant environmental permitting encumbrances (existing or anticipated in the future) associated with the Florida phosphate mining facilities and exploration properties. Mosaic does not anticipate any future encumbrances based on current known regulations and existing permitting processes. There are no material outstanding violations and fines.

3.4 Significant Factors and Risks That May Affect Access, Title or Work Programs

As discussed, mineral rights or surface rights are necessary to conduct mining in Florida. Once Mosaic owns or controls the mineral or surface rights, the risks related to title and access are mitigated. The risk that does exist is if there is an encumbrance or interest in the property that was not made a part of the public records and Mosaic is not aware of it. To mitigate that risk, title insurance is obtained for parcels that are acquired. However, there may be some legacy properties that have not gone through a title examination.

4.0 Accessibility, Climate, Local Resources, Infrastructure and Physiography

4.1 Physiography

4.1.1 Topography, Elevation and Vegetation

Much of the state of Florida is low-lying and fairly level, however there are some places that feature vistas that rise 50 to 100 ft. (15 to 30 m) above sea level. Central and North Florida, 25 miles (40 km) or more away from the coastline, feature rolling hills with elevations ranging from 100 to 250 ft. (30 to 76 m). Much of Florida has an elevation of less than 12 ft. (3.7 m). Due to the vast amounts of limestone bedrock that Florida sits above, water is allowed to move relatively freely beneath dry land and to rise up to the surface.

4.2 Accessibility

4.2.1 South Fort Meade Facility

Primary access to the South Fort Meade Facility is through the main entrance road off County Line Road (Figure 4-1). The mining areas are accessed by County Line Rd, CR 657, CR 664A, and CR 664B. The South Fort Meade entrance is a paved road directly off County Line Road 664 and is the primary entrance to the beneficiation plant area including offices, maintenance shops and warehouse. Due to the large footprint, the mining areas have multiple access points. A system of unpaved dirt roads extends from these access points and are maintained regularly with a fleet of motor graders. South Fort Meade is serviced by 4.4 miles (6.4 km) of internal railroad track that connects into the CSX rail network.

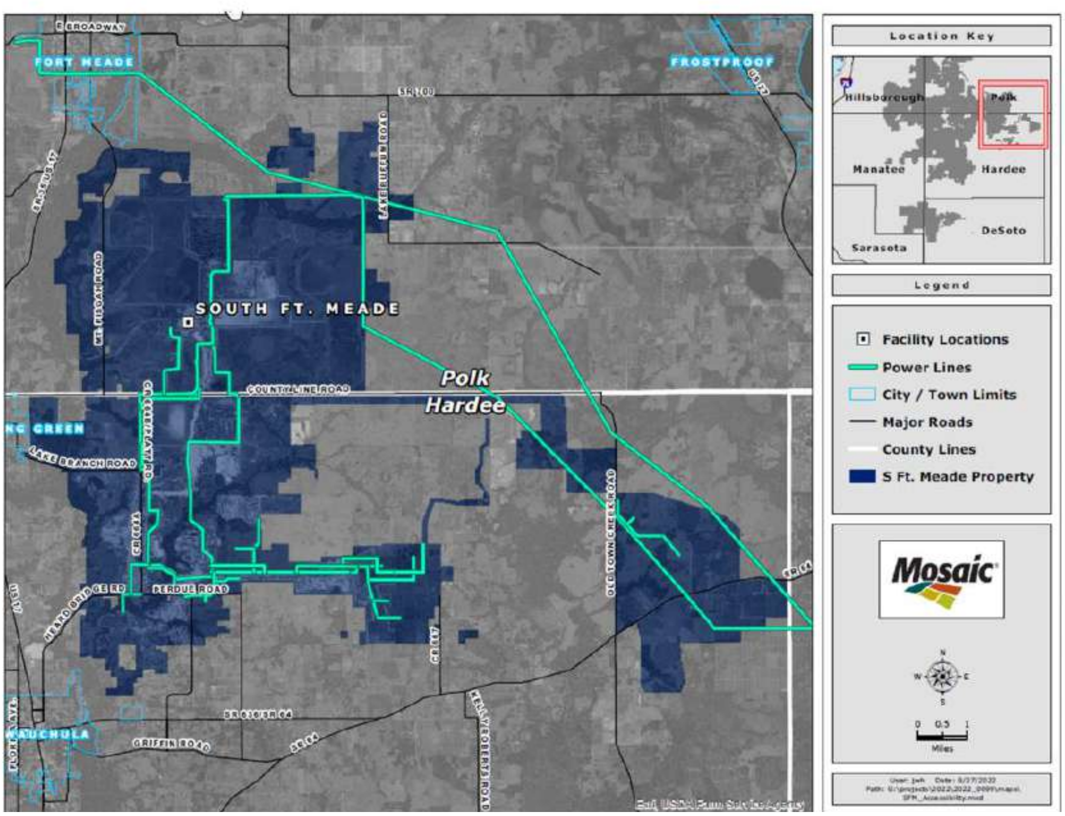


Figure 4-1: South Fort Meade Facility Location and Accessibility

4.2.2 Four Corners Facility

Primary access to the Four Corners Plant is through the Four Corners Mine Road entrance road off SR37 in Hillsborough County (Figure 4-2). The mining areas are accessed by SR37, SR39, SR62, Taylor-Gill Rd. and SR674.

Four Corners Mine Road is a paved road directly off Florida State Road 37 and is the primary entrance to the beneficiation plant area including offices, maintenance shops and warehouse. This access point is monitored with a security guard gate and manned 24/7. Due to the large footprint, the mining areas have multiple access points. A system of unpaved dirt roads extends from these access points through infrastructure corridors allow personnel to access production equipment, water storage areas and waste disposal areas. Higher volume main corridor roads are capped in rock and maintained regularly with motor graders.

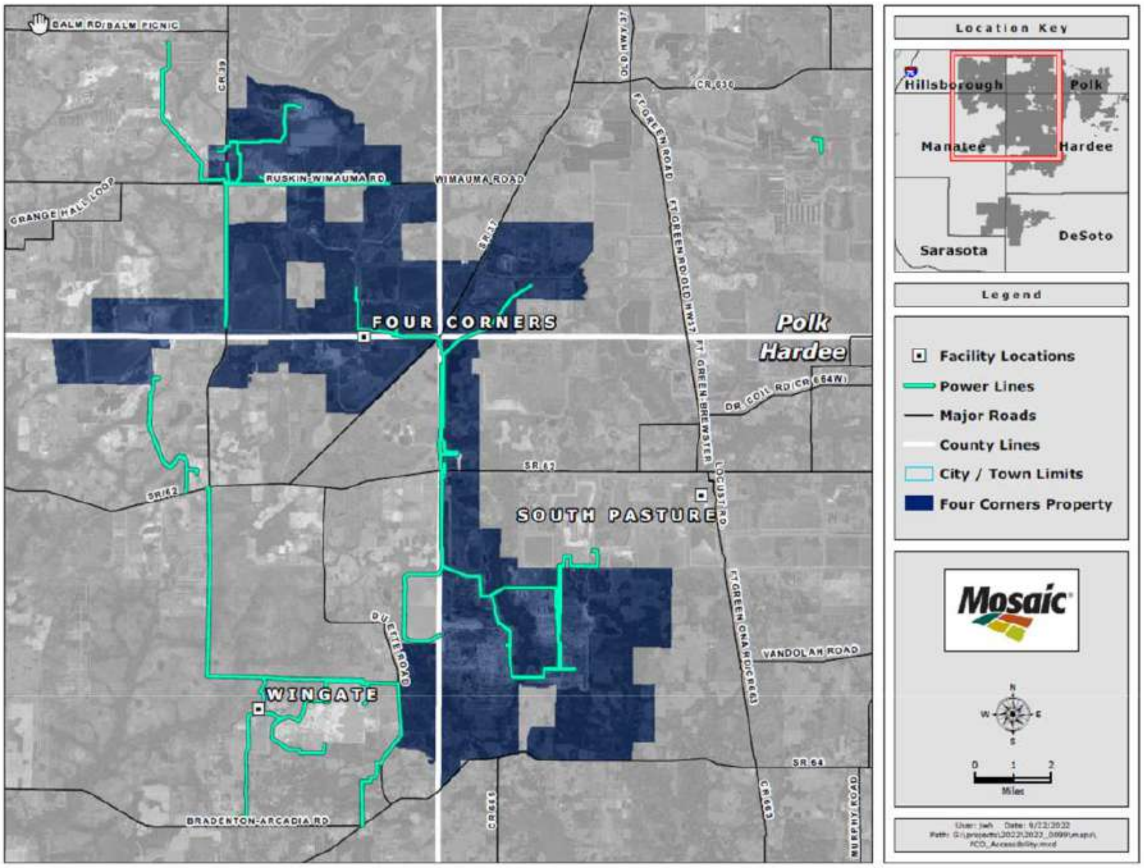


Figure 4-2: Four Corners Facility Location and Accessibility

4.2.3 Wingate Facility

Primary access to the Wingate Plant is through the Nu-Gulf Mine Road entrance off Duette Road in Manatee County (Figure 4-3). The mining areas are accessed from the main entrance road.

Nu-Gulf Mine Road is a paved road directly off Duette Road and is the primary entrance to the beneficiation plant area including offices, maintenance shops and warehouse. This access point is monitored with a security guard gate and manned during day shift hours on weekdays, Monday through Friday. Mine areas are accessed from the entrance road and a system of unpaved dirt roads extending from these access points through infrastructure corridors allow personnel to access production equipment, water storage areas and waste disposal areas. Higher volume main corridor roads are capped in rock and maintained regularly with motor graders.

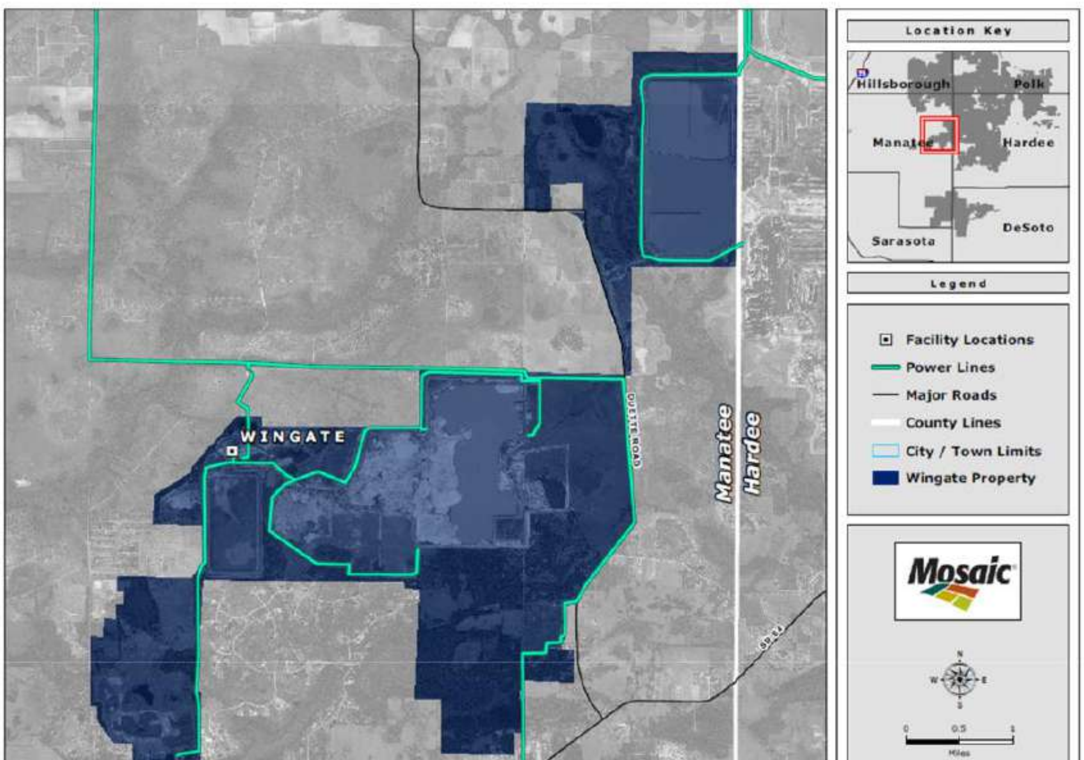


Figure 4-3: Wingate Facility Location and Accessibility

4.2.4 DeSoto Property

The DeSoto property is located just west of Arcadia, Florida with primary access via NW Pine Level Street and/or SR 70 and SR 72 in DeSoto County (Figure 4-4).

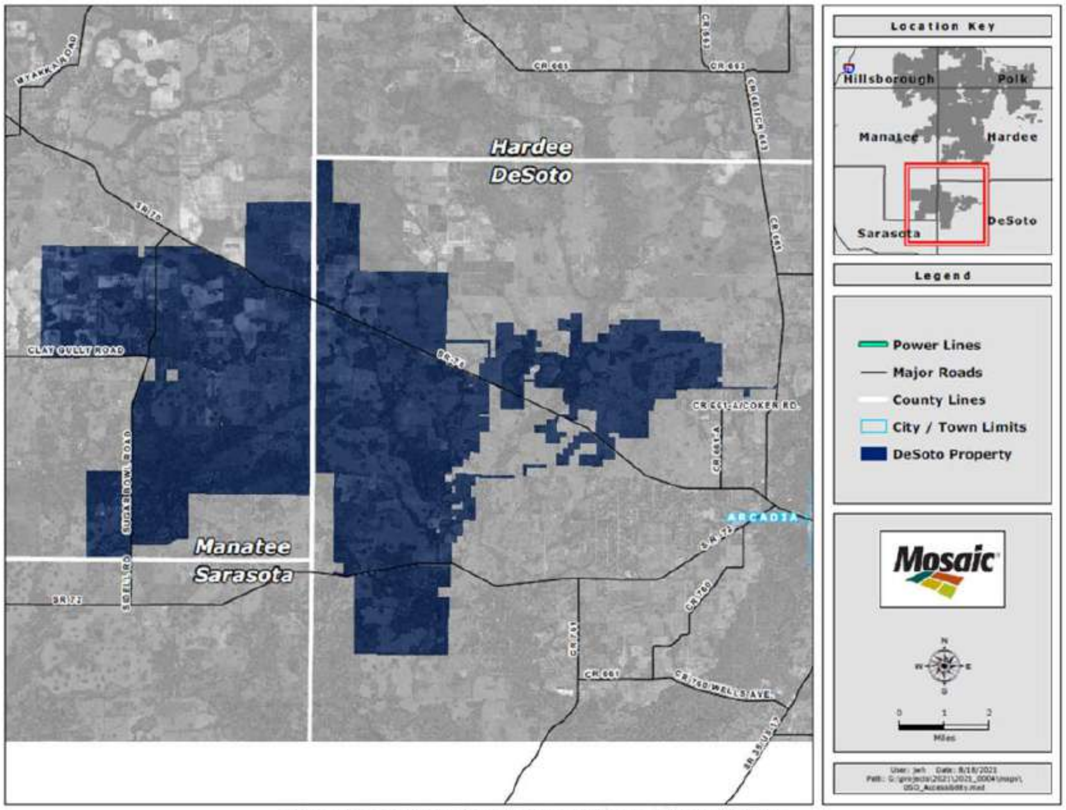


Figure 4-4: DeSoto Property Location and Accessibility

4.2.5 Pioneer Property

Primary access to the Pioneer property is expected to be from the South Pasture property corridors (Figure 4-5). The area can also be accessed from SR64 in Hardee County.

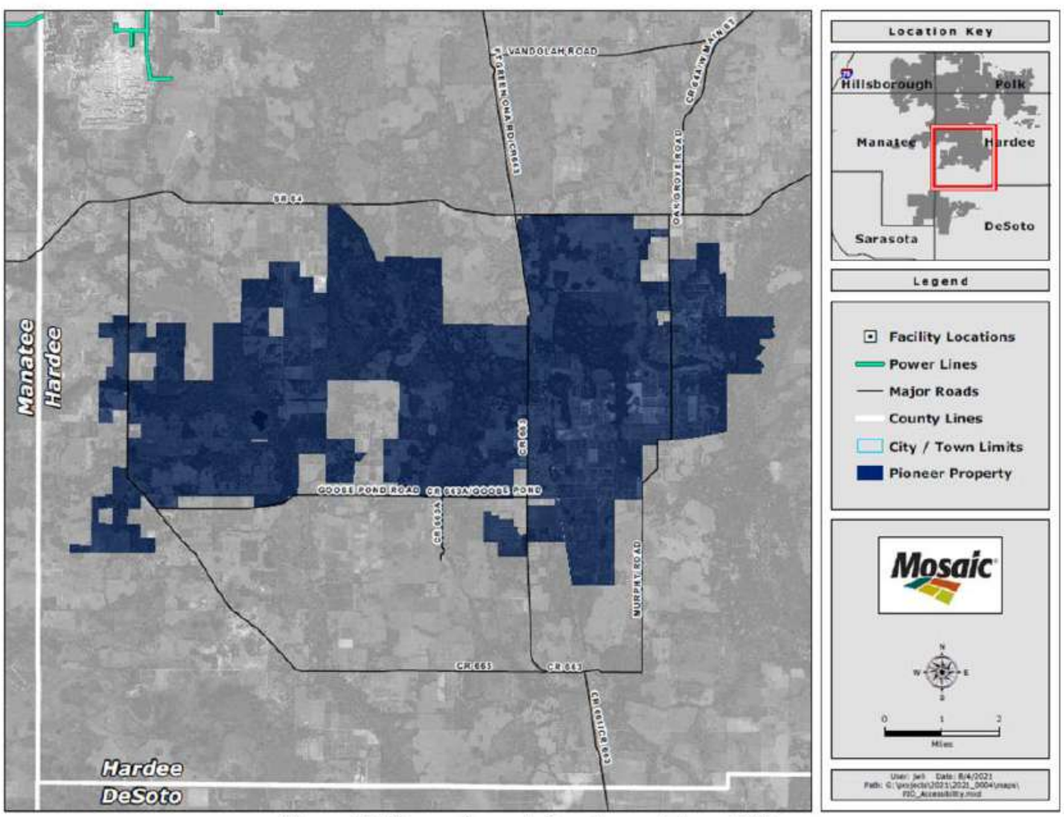


Figure 4-5: Pioneer Property Location and Accessibility

4.2.6 South Pasture Property

The South Pasture Mine View Road off SR 62 is the main entrance road to the beneficiation plant, including offices, maintenance shops and warehouse (Figure 4-6).

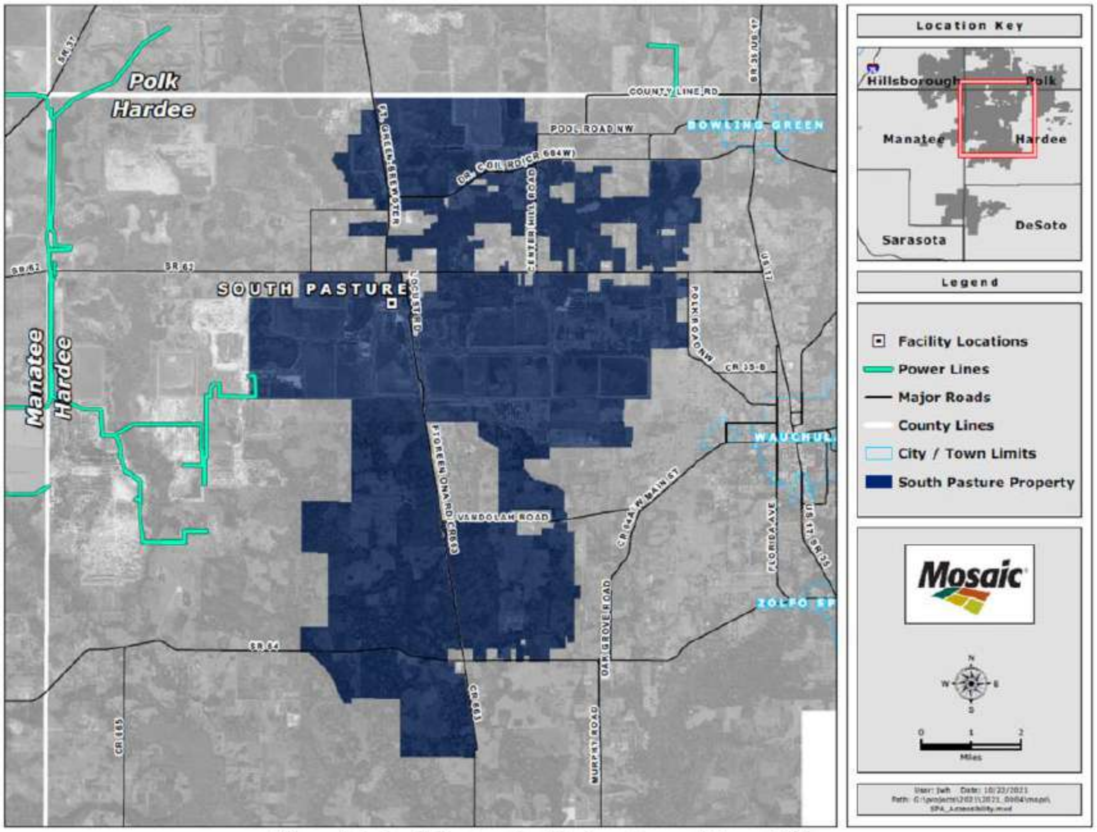


Figure 4-6: South Pasture Facility Location and Accessibility

4.3 Climate and Length of Operating Season

The climate of Florida is tempered by the fact that no part of the state is very distant from the ocean. In the northern areas, the prevalent climate is humid subtropical, while the southern coastal areas have a true tropical climate. Mean high temperatures for late July are range from 80 to 90°F (32 to 34°C). Mean low temperatures for early to mid-January range from 40 to 50°F (4 to 7°C) in northern Florida and 50°F (13°C) in southern Florida. In the summer, high temperatures in the state seldom exceed 100°F (38°C). During the late autumn and winter months, Florida occasionally experiences cold fronts that can bring high winds and relatively cooler temperatures for the entire state, with temperatures ranging from 20 to 30°F (-7 to 4°C). The seasons in Florida are determined more by precipitation than by temperature, with hot, wet springs and summers making up the wet season, and mild to cool, relatively dry winters and autumns, making the dry season.

The length of the operating season for the Florida phosphate mining facilities is the full year, respecting some statuary holidays. The facilities operate for an average of 365 days per year.

4.4 Infrastructure/Local Resources

4.4.1 Water

At South Fort Meade, potable water is provided to the plant and office areas from a well located in the plant area. Process water for plant and field operations is supplied by a recirculating water system distributed over the facility's large footprint. Clarified waste streams are combined with collected stormwater and groundwater intrusion to supply most of the South Fort Meade water needs, however two supplemental production deep wells are available in the beneficiation plant area if needed. South Fort Meade utilizes five smaller deep wells to supply service water to a small percentage of its field pump assets.

At Four Corners, potable water is provided to the plant and office areas from wells located near each office area. Process water for plant and field operations is mostly supplied by a recirculating water system distributed over the mine's large footprint. Clarified waste streams are combined with collected stormwater and groundwater intrusion to supply most of the Four Corners water needs, however four supplemental production deep wells are available in the Plant areas if needed. The Facility utilizes several smaller deep wells to supply service water to a percentage of its isolated field pump assets. In addition, Four Corners operates and maintains three well field pumps to supply Manatee County water via the Manatee River and one Alafia River augmentation well located in Hillsborough County, near the Lonesome Mine mining area.

Potable water at Wingate is provided to the plant and office areas from a potable well located in the plant area. Process water for plant and field operations is mostly supplied by a recirculating water system distributed over the mine's large footprint. Clarified waste streams are combined with collected stormwater and groundwater intrusion to supply most of the Wingate water needs, however, two supplemental production deep wells are available in the beneficiation plant area if needed. The facility utilizes smaller deep wells to supply service water to a small percentage of its isolated field pump assets.

There are no potable water or production-water assets at the DeSoto and Pioneer exploration properties.

At the South Pasture property potable water was provided to the plant and office areas from potable wells located in the plant area. Process water for plant and field operations was mostly supplied by a recirculating water system distributed over the mine's large footprint. Clarified waste streams were combined with collected stormwater and groundwater intrusion to supply most of the past South Pasture water needs, however, four supplemental production deep wells are available in the area, if needed in the future. South Pasture utilized smaller deep wells in the past to supply service water to a small percentage of its isolated field pump assets.

4.4.2 Power and Electricity

Duke Energy and the Mosaic cogeneration line from the Bartow chemical plant supply power to the South Fort Meade Facility. The beneficiation plant is powered from Duke Energy or Bartow cogeneration, while the mining area is powered by Duke Energy. Duke Energy supplies 230 kV power from Hines Power Plant in Fort Meade Florida; redundant 230 kV power can be supplied by the Duke Energy grid in central Florida. The 230 kV incoming power is routed through Duke

Energy's South Polk Substation and is converted to 115 kV power that runs via Duke-owned and operated overhead power lines to two Duke 115 to 25 kV substations and one 115 to 69 kV substation. The 25 kV or 69 kV power is routed throughout the mine through the South Fort Meade network of powerlines and substations. Diesel powered assets are used in particularly remote areas where electrical power distribution is impractical.

Duke Energy, PRECO, TECO and the Mosaic cogeneration line from the New Wales and South Pierce chemical plants supply power to the Four Corners Facility and plant areas. Four Corners presently uses approximately 15% cogenerated and 85% purchased power. The mining area power providers are divided by each power company's supply area as approved by the government. Each company and cogenerated electricity utilize supply lines of 69 kV power. Mosaic uses a fleet of 69 kV to 4160V and 7200 V substations to distribute power to electrically powered assets through areas of the mine. Individual assets are powered using fully insulated and sealed power cables. Diesel powered assets are used in particularly remote areas where electrical power distribution is impractical.

Florida Power and Duke Energy supply power to the Wingate Facility. The beneficiation plant and mining activities are powered from Florida Power while water return from the FM-1 and FM-2 clay settling pond is powered by Duke Energy. Wingate uses approximately 10% Duke Energy and 90% Florida Power. Cogenerated power is not available to the Wingate Facility. The mining area power provider is divided by each company's supply area as approved by the government. Each company utilizes supply lines of 69 kV power. Mosaic uses a fleet of 69 kV to 4160V and 7200 V substations to distribute power to electrically powered assets through areas of the mine. Individual assets are powered using fully insulated and sealed power cables. Diesel powered assets are used in particularly remote areas where electrical power distribution is impractical.

DeSoto and Pioneer properties are located within the PRECO service area.

Duke Energy and the Mosaic cogeneration line from the New Wales and South Pierce chemical plants supply power to the South Pasture property. When operations are resumed, South Pasture is expected to use approximately 69% Duke power and 31% Duke Energy. Duke Energy and Mosaic cogenerated power utilize the 69 kV supply lines. The South Pasture facility is expected to use a fleet of 69 kV to 4160V and 7200 V substations to distribute power to electrically powered assets through areas of the mine and plant. Individual assets are powered using fully insulated and sealed power cables. Diesel powered assets are used in particularly remote areas where electrical power distribution is impractical.

4.4.3 Roads and Logistics

The South Fort Meade Facility is located in central Florida with mining areas in Polk and Hardee counties. The facility is close to the town of Bowling Green and cities of Wauchula and Avon Park. Other population centers within a 50 mile (80 km) radius are the cities of Lakeland and Bartow, Florida. Logistical support to the site is primarily through the Florida Department of Transportation paved road system and CSX rail network. Executive airports are located in Wauchula, Bartow and Avon Park. A regional airport is located in Lakeland and an international airport is located in Tampa.

Primary access to Four Corners is through the Four Corners Mine Road entrance road off SR37 in Hillsborough County (Figure 15-2). The mining areas are accessed by SR37, SR39, SR62, Taylor-Gill Rd, and SR674. Four Corners Mine Road is a paved road directly off Florida State Road 37 and is the primary entrance road to the beneficiation plant area including offices, maintenance shops and warehouse. This access point is monitored with a security guard gate and manned 24 hours per day. Due to the large footprint, the mining areas have multiple access points. A system of unpaved dirt roads extends from these access points through infrastructure corridors allowing personnel access to production equipment, water storage areas and waste disposal areas. Higher volume main corridor roads are capped in rock and maintained regularly with motor graders. Most equipment, parts, and supplies to operate the mine are delivered via public roads and Mosaic's road network. Certain reagents used in the beneficiation process are delivered via CSX/Mosaic owned railways. All phosphate rock at Four Corners is transported by either truck or rail to downstream chemical plants. Four Corners utilizes a Mosaic owned railway spur and locomotive to transfer product rail cars to its Agrock facility. Agrock provides maintenance and storage for empty and loaded railcars. From that point CSX picks up rail cars loaded with phosphate rock and delivers to the Mosaic fertilizer plants via CSX rail networks and locomotives. Four Corners utilizes truck haulage of final product on public roads to supplement rail haulage depending on logistics timing and destination.

Primary access to Wingate is through the Nu-Gulf Mine Road entrance off Duette Road in Manatee County. The mining areas are accessed from the main entrance road. Nu-Gulf Mine Road is a paved road directly off County Line Road 664 and is the main entrance road to the beneficiation plant area including offices, maintenance shops and warehouse. This access

point is monitored with a security guard gate and manned during day shift hours Monday through Friday. Mine areas are accessed from the entrance road and a system of unpaved dirt roads extending from these access points through infrastructure corridors allows personnel to access production equipment, water storage areas and waste disposal areas. Higher volume main corridor roads are capped in rock and maintained regularly with fleet of motor graders. Most equipment, parts, and supplies to operate the mine are delivered via public roads and then utilize Mosaic's road network. There is no rail service to the Wingate site. All final product at Wingate is transported via truck to the Four Corners facility for final shipping or directly to a Mosaic chemical plant. Wingate truck haulage of final product on public roads is only permitted using the Duette Road traveling north to SR62.

The DeSoto property is located just west of Arcadia, Florida with primary access to the property via NW Pine Level Street and/or SR 70 and SR 72 in DeSoto County. The area is not developed and there is no rail service available to the property.

Primary access to the Pioneer exploration property is expected to be from the South Pasture Facility corridors. The mining areas are expected to be accessed from SR64 in Hardee County. Potential mining areas are expected to be accessed from the entrance road and a system of unpaved dirt roads extending from these access points through infrastructure corridors allowing personnel access to production equipment, water storage areas and waste disposal areas. All phosphate rock from Pioneer is expected to be transported by rail and truck from the South Pasture Facility directly to a Mosaic chemical plant.

The South Pasture Mine View Road off SR 62 is the main entrance road to the beneficiation plant, including offices, maintenance shops and warehouse. Mining areas are accessed from the entrance road and a system of unpaved dirt roads extending from these access points through infrastructure corridors allowing personnel access to production equipment, water storage areas and waste disposal areas. Most equipment, parts and supplies are expected to be delivered via public roads and then utilize the Mosaic road network. All phosphate rock at South Pasture is expected to be transported by CSX railroad directly to a Mosaic chemical plant.

4.4.4 Personnel

The South Fort Meade Facility is located within a one-hour drive of many population centers. A majority of the workforce resides in the cities of Wauchula, Bartow and Lakeland. Additional third-party support services are available in Tampa that can be accessed by car in 1.5 hours or via air travel through Tampa or Lakeland Airports. The South Fort Meade Facility is serviced by multiple hospitals in Wauchula, Bartow and Lakeland. South Fort Meade has a helipad available for Medivac emergency support to Tampa General or Lakeland Regional Hospitals.

The Four Corners Facility is located within a one-hour drive of many population centers. The workforce employees reside in the cities of Brandon, Valrico, Wauchula, Bartow and Lakeland. Additionally, third-party support services are available in Tampa that can be accessed by car in about an hour. Air travel can easily be completed through Tampa or Lakeland Airports. The Four Corners Facility is serviced by multiple hospitals in Brandon, Valrico, Tampa and Lakeland. Four Corners has a helipad available for Medivac emergency support to Tampa General or Lakeland Regional Hospitals.

The Wingate Facility is located within a one-hour drive of many population centers. The workforce employees reside in the cities of Brandon, Valrico, Bradenton, Apollo Beach and Lakeland. Additionally, third-party support services are available in Tampa that can be accessed by car in about an hour. Air travel can easily be completed through Tampa or Lakeland Airports. The Wingate Facility is serviced by multiple hospitals in Brandon, Tampa and Lakeland. Four Corners has a helipad available for Medivac emergency support to Tampa General or Lakeland Regional Hospitals.

The DeSoto property is located just outside of Arcadia, Florida and within a 1.5-hour drive of many population centers. The workforce employees are expected to reside in the cities of Sarasota, Arcadia, Bartow, Wauchula, Fort Meade, Siesta Key, Venice and Lakeland. Additionally, third-party support services are expected to be available in Tampa that can be accessed by car in about an hour also. Air travel can easily be completed through Tampa, Sarasota or Lakeland Airports. The property is expected to be serviced by multiple hospitals in Sarasota, Tampa and Lakeland.

The Pioneer property is located within a one-hour drive of many population centers. The workforce employees are expected to reside in the cities of Brandon, Valrico, Bradenton, Wauchula, Bartow and Lakeland. Additionally, third-party support services are expected to be available in Tampa that can be accessed by car in about 1.5 hours. Air travel can easily be completed through Tampa or Lakeland Airports. The property is expected to be serviced by multiple hospitals in Brandon, Tampa and Lakeland. Pioneer, via the South Pasture property, is expected to have a helipad available for Medivac emergency support to Tampa General or Lakeland Regional Hospitals.

The South Pasture exploration property is located within a one-hour drive of many population centers. The workforce employees are expected to reside in the cities of Brandon, Valrico, Bradenton, Wauchula and Bartow. Additionally, third-party support services are expected to be available in Tampa that can be accessed by car in about 1.5 hours. Air travel can easily be completed through Tampa or Lakeland Airports. The property is expected to be serviced by multiple hospitals in Brandon, Tampa and Lakeland. South Pasture is expected to have a helipad available for Medivac emergency support to Tampa General or Lakeland Regional Hospitals.

4.4.5 Supplies

Phosphate mining in central Florida is a mature industry with a variety of companies operating mines in the area over the last 75 years. A robust network of suppliers, machine shops, fabricators and speciality contractors exist to support mining and reclamation activities. Many large component vendors have branch offices in either Lakeland or Tampa. Engineering, design, and technical services are readily available in Bartow, Lakeland and Tampa. Much of this support infrastructure also supports Mosaic's chemical plants in the area, further increasing the stability of the support network for Florida phosphate mining.

5.0 History

Table 5-1: Florida Phosphate Mining History

Date	Event/Activity
1881	Pebble phosphate discovered along the Peace River south of Fort Meade by Captain J. Francis LeBaron, chief engineer of a detachment of the Engineering Corps, United States Army.
1888	Phosphate rock first commercially mined along the Peace River.
1977	Farmland Industries purchased the Pioneer (eastern portion a.k.a. Hickory Creek) property.
1981	Beker Phosphate Company initially opened Wingate.
1983	Four Corners construction was completed. The operation was an equal partnership between IMC and W.R. Grace Corporation.
1985	Wingate was closed after Beker Phosphates files for bankruptcy.

1985	Four Corners started production.
1986	IMC purchased Brewster Phosphates and closed the Lonesome Mine which would later be consolidated into Four Corners.
1986	Four Corners is idled due to market conditions.
1986	The DeSoto (also known as Pine Level) property is sold by AMAX Chemical Company to Consolidated Minerals, Incorporated (CMI).
1988	IMC gained 100% control of Four Corners.
1989	IMC restarted Four Corners.
1990	Wingate is acquired by Nu-Gulf.
1992	Wingate is reopened after a joint venture by Nu-Gulf and Royster Industries but closed later that year.
1993	IMC-Agrico is created by a joint venture by IMC and Agrico Chemical Company (a subsidiary of Freeport McMoRan).
1995	CF Industries opened and started production at South Pasture.
1995	Mobil Chemical Corporation opened and started production at South Fort Meade.
1996	Cargill Fertilizer (later Cargill Crop Nutrition) acquired South Fort Meade.
1996	DeSoto (a.k.a. Pine Level) and Ona (includes western portion of Pioneer) properties are sold by CMI to IMC-Agrico.
1997	IMC acquired Freeport McMoRan's share of IMC-Agrico.
1998	Wingate is reopened.
1999	Wingate is closed.
2002	Cargill Crop Nutrition acquired Pioneer (eastern portion a.k.a. Hickory Creek) from Farmland-Hydro.
2004	Cargill Crop Nutrition acquired and reopened the Wingate Facility.
2004	Mosaic was created through a merger between IMC and Cargill's Crop Nutrition business.
2005	Wingate is shut down.
2006	The Fort Green site is closed permanently and the property is consolidated into Four Corners and Wingate.
2008	Wingate is reopened.
2014	Mosaic acquired CF Industries' phosphate business in Florida, including the South Pasture property.
2018	The South Pasture Facility is idled.
2018	Ona (western portion) property is consolidated into the Four Corners Facility.
2020	Mosaic acquired the Eastern Reserves Phase I.
2022	Mosaic acquired the Eastern Reserves Phase II.

Table 5-2 outlines the production history to the end of 2022. The 2022 production includes actual data for the months January to October and a forecast for November and December. Four Corners data is not available prior to 2005 due to database challenges and there is no South Pasture historical data prior to March 2014 available. To note, South Fort Meade did not produce for most of the time in 2011 due to a permitting issue. Wingate stopped production in 2006 due to market conditions. Mosaic purchased South Pasture in March 2014 and idled the site in August 2018.

Table 5-2: Production History

Year	South Fort Meade Facility			Four Corners Facility			Wingate Facility			South Pasture		
	Tons	Tonnes	% P_2O_5	Tons	Tonnes	% P_2O_5	Tons	Tonnes	% P_2O_5	Tons	Tonnes	% P_2O_5
1995 to 2000	18,324,388	16,623,885	29.5	36,597,906	33,201,621	29.2				17,629,217	15,993,226	29.6
2001 to 2010	58,347,800	52,933,124	29.1	29,428,990	26,697,980	30.1	4,724,155	4,285,753	29.4	33,076,792	30,007,266	29.4
2011	15,900	14,424	29.4	7,900,385	7,167,229	29.5	1,087,068	986,188	29.4	3,504,059	3,178,882	28.9
2012	4,099,645	3,719,198	29.1	7,829,940	7,103,322	29.4	1,846,234	1,674,903	28.4	3,482,504	3,159,328	29.2
2013	5,453,596	4,947,502	29.5	6,657,860	6,040,011	29.3	1,468,412	1,332,143	28.4	3,565,361	3,234,495	29.0
2014	4,486,923	4,070,537	28.2	5,941,205	5,389,861	29.3	1,246,583	1,130,900	29.2	3,671,298	3,330,602	28.1
2015	4,725,970	4,287,400	28.5	6,328,755	5,741,447	29.1	1,370,500	1,243,318	29.2	3,607,028	3,272,296	28.1
2016	4,642,757	4,211,909	28.8	5,845,800	5,303,310	28.9	1,380,926	1,252,776	28.9	3,785,671	3,434,361	28.6
2017	4,863,666	4,412,318	29.1	7,057,530	6,402,591	28.6	1,529,404	1,387,475	28.6	3,061,315	2,777,225	28.7
2018	4,669,596	4,236,257	28.9	7,647,568	6,937,874	28.5	1,752,125	1,589,528	28.1	1,594,651	1,446,667	28.6
2019	4,677,530	4,243,455	28.2	7,162,630	6,497,938	28.7	1,659,245	1,505,267	29.1	n/a	n/a	n/a
2020	4,086,632	3,707,393	28.4	8,482,144	7,695,001	28.4	1,485,707	1,347,833	28.4	n/a	n/a	n/a
2021	3,179,984	2,884,882	27.0	7,854,910	7,125,974	28.4	1,146,796	1,040,373	28.4	n/a	n/a	n/a
2022	2,737,850	2,483,777	25.7	7,370,293	6,686,330	28.1	1,340,195	1,215,825	28.7	n/a	n/a	n/a
Total	**124,574,387**	**112,776,061**	**28.9**	**152,105,916**	**137,990,487**	**29.1**	**22,037,350**	**19,992,284**	**28.9**	**76,977,896**	**69,834,348**	**29.2**

6.0 Geological Setting, Mineralization and Deposit

6.1 Deposit Type

The phosphate deposits of Florida are sedimentary in origin and part of a phosphate-bearing province that extends from southern Florida north along the Atlantic coast into southern Virginia. Sedimentary phosphate deposits consist of rock in which the phosphate mineral(s) occur in grains, pellets, nodules and as phosphate replacement of calcium in the remains of animal skeletal material and excrement.

Deposition of sedimentary phosphate rock is a continual process through geologic time and continues to the present. The materials that enter into sedimentary deposits have been derived chiefly from the weathering of rocks and organic material. The source of sedimentary phosphate is phosphorous-bearing rocks and minerals, with the transportation medium for such deposits being predominantly water. For the most part, the phosphate reaches the sea, but some is deposited in inland bodies of water or interior land basins.

The reworking of phosphate-rich sediments is a major factor in the development of economic deposits of phosphate rock. Matrix material moved by variations in the intensity and the direction of ocean currents leaves behind a phosphoric residue that in turn is moved and concentrated by currents. Transgressing seas can result in multiple cycles of phosphate pellet burial and subsequent erosion.

6.2 Regional Geology

Florida has phosphate rock distributed along the entire peninsula with varying lateral extents and abundance. There are five phosphate districts recognized in Florida identified as the Northern, Northeast, Hardrock, Southeast and Central (Figure 6-1). The phosphate of Florida occurs in sedimentary rocks and are of secondary origin, having been redeposited either by mechanical or chemical action. During deposition most of the carbonate platform was drowned, and deposition was widespread. The intensity of reworking by marine processes allows some deposits to remain relatively near their origins and contribute to massive deposits while others were transported and winnowed into deposits of nodules, grains and pellets.

The initial depositional environments affecting the Florida Platform were restricted environments allowing for intense evaporation and the development of evaporites in limited areas. As the Gulf of Mexico continued to expand and sea levels rose, siliciclastic and carbonate depositional environments began to cover more of the platform. Continued sea-level rise through the Cretaceous period eventually covered the exposed land area in northern Florida. The Florida Platform sediments were deposited in a complex interplay of siliciclastic, carbonate and evaporite facies as a result of sea level fluctuations (Randazzo 1997). Siliciclastic deposition predominated on the northern part of the platform while carbonate and evaporate sediments formed to the south (Randazzo 1997). In the early Cenozoic era (Paleogene period), the siliciclastic sediment supply was limited due to the highlands of the Appalachian trend having been reduced by erosion, and carbonate deposition expanded to cover the entire Florida Platform and beyond by the Oligocene epoch. The carbonate platform, that began as a rimmed shelf in the Jurassic period, evolved to a carbonate ramp sequence by the early Cenozoic era (Randazzo 1997; Winston 1991). Subsequent to the maximum development of the carbonate platform, uplift occurred in the Appalachians providing a renewed supply of siliciclastic sediments (Scott 1988; Brewster-Wingard et al. 1997). This influx of siliciclastic sediments in the Neogene period replaced most carbonate deposition on the Florida Platform by the mid-Pliocene epoch. As sea level rose in the late Pleistocene epoch, there was a decrease in siliciclastic sedimentation and carbonate deposition increased on the southern Florida Platform. The interplay of the carbonate and siliciclastic sediments with fluctuating sea level and changing climate created complex depositional environments (Scott 1988; Missimer 2002). The interaction of the carbonates and siliciclastic on the Florida Platform has been investigated and discussed by a number of authors (Warzeski et al. 1996; Cunningham et al. 1998; Guertin 1998; Guertin et al. 2000; Missimer et al. 2000; Missimer 2001, 2002; Cunningham et al. 2003).

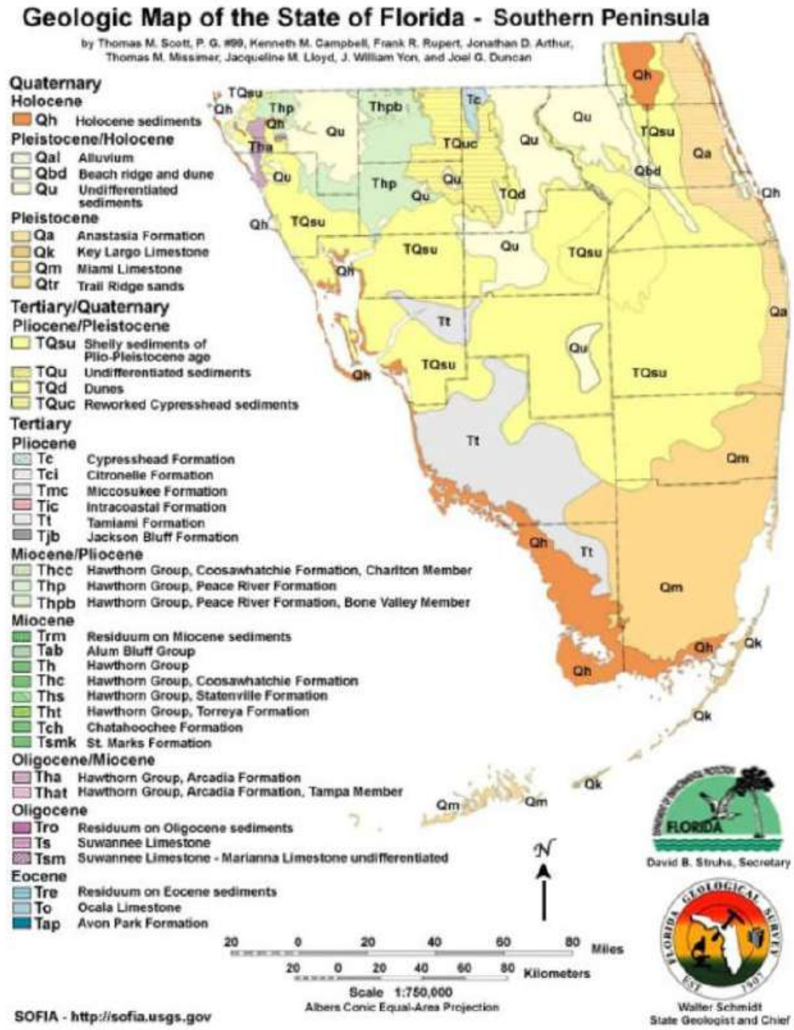


Figure 6-1: Regional Geology

On a regional basis, deposits consist of four zones: overburden generally 5 to 50 ft. (1.5 to 15.2 m) thick, matrix generally 3 to 30 ft. (1.0 to 9.1 m) thick, bed clay and the basal bedrock.

The overburden is comprised predominantly of soil, clay and sand, and while it may contain minor amounts of phosphate-bearing material, this cannot be economically recovered.

The matrix (that is, the ore) consists primarily of the mineral fluorapatite, silica sand and clay minerals. The +1 mm size fraction, after washing to remove clay, is termed "washer rock" or "pebble". The 150 mesh x 1 mm size fraction is processed by cyclones and froth flotation, with the resulting concentrates being the "concentrate". The -150 mesh fraction is a phosphatic clay and can contain as much as one-third of the total phosphate present in the matrix. This material cannot be recovered by beneficiation and is discarded as waste.

The bed clay that lies beneath the matrix is visibly different from the matrix. It may contain insignificant phosphate values and limestone boulders. The bedrock that lies beneath the bed clay is limestone or dolomitic limestone.

6.3 Local Geology

The Central Florida Phosphate District (Central District), in which the Mosaic phosphate operations and projects are located is subdivided into two portions, the Land Pebble District on the north and the South Florida Extension on the south. Most of the original phosphate in Florida was deposited in rocks of the Hawthorn Group of Middle Miocene epoch. These rocks were subsequently reworked, concentrated and enriched, and the contained phosphate ultimately redeposited in the Bone Valley Member of the Peace River Formation in the upper part of the Hawthorn Group. The local stratigraphic relationship of these units is shown in Figure 6-2. The potentially mineable portion of the Central District encompasses an area approximately 80 miles (129 km) in length in a north-south direction and approximately 40 miles (64 km) in width.

Quaternary Period	Recent Epoch		Stream terraces and bars Mostly gray to white poorly graded quartz sand with varying abundance of reworked phosphate grains. Thickness 0 to 50 ft. (0.0 to 15.2 m).	Waste
	Pleistocene Epoch		Pleistocene Epoch Deposits Brown to gray quartz sands with scattered thin lenses of blue-gray to green-gray clay and occasional lentils of freshwater limestone. Thickness 0 to 20 ft. (0.0 to 6.1 m).	
Tertiary Period	Pliocene Epoch		Bone Valley Member Peace River Formation Gray-blue with lineation of red, brown and white. Phosphate nodules and pellets are the dominant constituent. Quartz sands and clays may be abundant in places. Fossiliferous with terrestrial and marine vertebrates. Thickness 18 to 30 ft. (5.5 to 9.1 m).	Phosphatic
	Miocene Epoch	upper		
		lower	Undifferentiated Peace River Formation Gray to gray-blue quartz sands, clays and phosphate grains and some nodules. Weathered residuum exists frequently near contact with Bone Valley Formation.	Phosphatic to Bed

Figure 6-2: Local Stratigraphic Column

The Central District has been the source of more than 70% of the phosphate rock produced in the United States during most of this century and as much as 30% of the world's total production. Mining began in the late 1800s and has continued to the present. During the early years, mining was principally from "river pebble" deposits (that is, deposits of phosphate concentrated by rivers and streams reworking older sediments), with the mining of "land pebble" deposits increasing as these deposits were depleted.

Phosphate deposits in the Central District are composed of phosphate particles ranging from clay to pebble size (-16 mesh), quartz grains, carbonate grains, and clay minerals. Only material with a particle size greater than 150 mesh can be recovered economically with current technology. The higher the pebble content of phosphate ore, the less beneficiation that is required since most of the pebble material is an economic product after simple screening, that results in lower overall production costs.

The Bone Valley Member of the Peace River Formation is the ore-bearing unit in those properties lying in the Land Pebble District, primarily in Hillsborough and Polk Counties. Mineralization in this unit generally ranges between 15 to 25 ft. (4.6 to 7.6 m) thick, with grades in the range of 31 to 33% P_2O_5. This unit is noted for the relatively high pebble content of the matrix, ranging between 20 and 60%. Overburden ranges from 18 to 30 ft. (5.5 to 9.1 m) thick.

The Bone Valley Member is late Miocene and early Pliocene epochs and consists of a lower phosphorite unit and an upper clayey sand unit that contains only minor phosphate (Altschuler and others, 1964). The phosphate in the Bone Valley Member was derived from the underlying Peace River Formation and is enriched in P_2O_5 and concentrated. The lower phosphorite unit consists of gray-green, gray-brown, and gray sand and clay that contain abundant phosphate particles ranging from about 0.1 mm to several centimeters in diameter. The phosphate particles contain from 30 to 40% P_2O_5, and the phosphate mineral is carbonate fluorapatite, also known as francolite, but with only small amounts of CO_3 substituting for PO_4. Weathering after deposition formed aluminum phosphate minerals from the original apatite and altered the clay minerals to kaolinite. The lower phosphorite unit of the Bone Valley Member ranges in thickness from 0 to 50 ft. (0 to 15.2 m). Thin beds of dolomite, doloclay, or dolosilt are present.

The Bone Valley Member undergoes facies change to the south into the South Florida Extension, where it contains little or no phosphate values. The potentially mineable unit in this district is the Undifferentiated Peace River Formation, in which the potential ore zones are stratigraphically lower than those of the Bone Valley Member. Potential ore zones in this unit range from 15 to 20 ft. (4.5 to 6.1 m) thick, with grades in the range of 30 to 31% P_2O_5. The pebble content of the matrix in this unit is considerably lower than in the Bone Valley Member to the north, generally in the range of 10 to 25%. The overburden ranges from 18 to 36 ft. (5.5 to 11.0 m) thick.

One of the major differences between deposits in the Land Pebble District and those in the South Florida Extension is the amount of magnesium in the product. Magnesium-rich limestone increases sulfuric acid consumption during phosphate rock digestion and can degrade the quality of the final fertilizer prill. The maximum acceptable level of magnesium, reported as

MgO, is approximately 1.25% MgO.

Phosphate in the Hawthorn Formation was deposited when cold, phosphorous-enriched marine water welled up onto a shallow warm-water plateau, or when cold, along-shore currents were turbulently mixed with warmer waters and phosphorous precipitated. Structural features on the coastal plain partially controlled the deposition. The deposits are located in basins on the flanks of the anticlines that were rising at the time, with deposition occurring mainly in these basins. Within the Central District a small structural feature known as the Hillsborough High controls phosphate deposition along its flank.

6.4 Property Geology

6.4.1 General Deposit Description

All active mine deposits are in the Central Florida Phosphate District. The general description of the phosphatic deposits in Central Florida active mines consist of two general geological facies. The phosphate bearing units are within the Bone Valley Member of the Peace River Formation and the Undifferentiated Member of the Peace River Formation within the South Florida Extension region of the Central District. The deposit characteristics transition from northeast to the southwest. The major phosphate bearing units in the northeast consist of a productive Bone Valley Member with limited production in the

Undifferentiated Member. The phosphate bearing units in the southwest exhibit limited production in the Bone Valley Member and a productive Undifferentiated Member of the Peace River Formation.

6.4.2 South Fort Meade Deposit

The site geology of South Fort Meade consists of 5 to 50 ft. (1.5 to 15.2 m) of tan to brown sand to sandy clay material overlaying the Bone Valley Member. The Bone Valley is late Miocene and early Pliocene epoch in age and consists of a lower phosphorite unit and an upper clayey sand unit that contains only minor phosphate (Altschuler and others, 1964). The phosphate in the Bone Valley Member was derived from the underlying Peace River Formation within the Hawthorn Group and is enriched in P_2O_5 and concentrated. The lower phosphorite unit consists of gray-green, gray-brown and gray sand and clay that contain abundant phosphate particles ranging from about 0.1 mm to several centimeters in diameter. The lower phosphorite unit of the Bone Valley Member ranges in thickness from 0 to 50 ft. (0 to 15.2 m). Thin beds of dolomite, doloclay or dolosilt are present. The bed material is green to dark gray barren sandy clay to limestone or dolostone. Phosphate pebbles and nodules predominant product grain size with pebbles and nodules making up approximately 60% of the recoverable phosphate. The phosphate grains and clasts contain from 30 to 34% P_2O_5. The phosphate pebbles and nodules contain from 24 to 30% P_2O_5.

Deposit Dimensions

The South Fort Meade deposit prior to mining extended under the entire limits of the property for a total 40,953 acres (16,573 hectares). The average extents of the deposit are 9.5 miles (15.3 km) north to south and 5.7 miles (9.2 km) east to west. The mineral reserves extend from 1174525N to 1193581N and 731317E to 796915E.

Lithologies

The geology of the South Fort Meade deposit consists of bed clay and limestone overlain by matrix and an upper overburden horizon (Figure 6-3).

Overburden	Mostly gray to white poorly graded quartz sand with varying abundance of reworked phosphate grains. Thickness 5 to 50 ft. (1.5 to 15.2 m).	Waste
Matrix	Gray to gray-blue with lineation of red, brown and white. Phosphate nodules and pellets are the dominant constituent to gray to gray-blue quartz sands, clays and phosphate grains and some nodules. Thickness 0 to 50 ft. (0.0 to 15.2 m)	Phosphatic
Bed Clay and Limestone	Gray to gray-blue barren clays to phosphatic limestone rubble to beds of phosphatic limestone. Thickness is unknown by company exploration.	Bottom

Figure 6-3: South Fort Meade Geology Section

The South Fort Meade phosphate deposit occurs in the Bone Valley Member and consists of soils ranging from sand to sandy clay in mineable thicknesses of 4 to 50 ft. (1.2 to 15.2 m). The deposit often appears as gray to blue-green sandy clay but can also appears as tan to gray sands. Within the deposit there are interbeds of stiff cream-yellow dolomitic clays and barren blue-green clay layers with high impurities and/or low phosphatic content. These beds pinch out laterally and are often limited in scope. The contacts between layers are mostly distinct but can be gradual where leaching occurs.

The overburden waste material consists of quartz sands and occasional lenses of freshwater limestone and residuum. There are grains of reworked phosphate throughout but are dispersed and in low abundance. There may be marine beds of clayey sand and sandy clay that are uneconomic beds that are devoid of phosphate.

Mineable concentrations of phosphate grains, nodules and pellets exist in clayey sand to sandy clay beds of sediments. The bed contact with the overlying waste material is predominantly distinct with a thin bed of phosphate pellets or nodules clearly visible. The reworking of this material by hydrologic processes can occasionally leach the phosphate leaving either enriched grains and nodules or residuum. In small areas this distinct bed pinches out and beds of clayey sand with predominantly phosphate grains appear and grade in normal and reverse bedding.

The minable beds are near shore marine and fluvial in nature and present in consistent transgressive and regressive package that dips gently away from the paleo shoreline to the southwest direction. These beds and phosphate clasts are ubiquitous within the site. The beds economic viability is determined by phosphatic grade dilution in the form of insoluble clasts and/or degraded quality in the form magnesium.

Interbeds of waste are preset in small amounts in the form of poorly indurated dolomitic limestone beds, dolomitic marl and beds devoid of phosphate clasts. These interbeds may or may not have viable phosphatic beds below them. They are amorphous, lenticular and trend with the paleo-coastline and limited to a few hundred to a few thousand square feet in area.

Basal phosphatic beds are present from time to time and are recovered when magnesium is within acceptable ranges. These basal beds and the economic beds sit atop phosphatic limestone or dolostone that can vary in degree of induration. Unrecoverable beds of phosphate occur in dolomitic marl. These beds indicate the bottom of the mineable mineralization.

Structure

No major structures have been identified on the property from drilling and observations made during the mining process.

Alteration

Post-depositional dissolution of francolite occurs in areas throughout the deposit. Metals dissociate from the lattice structure upgrading or degrading the remaining mineral. The mineral can be upgraded by the removal of metals, namely calcium, in the natural leaching process. Dissolution of dolomitic clasts removing magnesium can also serve to upgrade the rock.

The dissolution of aluminosilicates in the waste beds can provide aluminum to substitute into the mineral and can degrade the quality of finished product. Humates present in sufficient quantities within the subsurface provide iron that can substitute into the mineral and can also degrade quality.

Mineralization

Waste material consists of quartz sand and is predominantly rounded subaerial clasts ranging in size from 0.1 to 1 mm. There are occasional beds of freshwater limestone and beds of poorly indurated floatstone or packstone.

The primary phosphate mineral in the South Fort Meade deposit is francolite. Francolite mineralization occurs by substitution of phosphorus into the carbonate minerals. These are in the form of sub-rounded to rounded clasts present as nodules, pellets, grains, bioclasts, and clays ranging in size from 0.1 to 3.0 mm.

Limestone and dolostone are present as clasts and as interbeds of waste. These are usually found as rounded clasts of micritic limestone or dolostone, bioclasts, beds of poorly indurated micrite or dismicrite and beds of poorly indurated floatstone or packstone.

6.4.3 Four Corners Deposit

The site geology of Four Corners is varied due to the size of the property. Mining currently takes place in two distinct deposit facies. The mine historically has operated exclusively within the Bone Valley Member. The mine now produces predominantly within the South Florida Extension with limited production in the Bone Valley Member and predominant production within the Hawthorn Group.

In general, the Bone Valley Member is a series of continuous marine basins that exist north of Florida State Road 62. These basins generally trend north to south. Most of this deposit has been mined. There is a minority of production ongoing in the remaining area.

The economic zone in the South Florida Extension portion of the Central District exists generally south of Florida State Road 62. The Bone Valley Member of the deposit thins, is relatively discontinuous and pinches out southwards. The majority of Four Corners mining is currently within the Hawthorn Group and is a series of thick and continuous marine beds that dip gently towards the southwest. Phosphate grains and clasts are the predominant grain size with pebbles and nodules making up approximately 29% of the recoverable phosphate. The phosphate grains and clasts contain from 30 to 33% P_2O_5. The phosphate pebbles and nodules contain from 25 to 29% P_2O_5. The bed material is green to dark gray barren sandy clay to limestone or dolostone.

Deposit Dimensions

Prior to mining, the Four Corners deposit extended under the entire limits of the property, for a total 54,671 acres (22,124 hectares). The average extents of the deposit are 19 miles (30.6 km) north to south and 15 miles (24.1 km) east to west. The mineral resources and mineral reserves extend from 1141896N to 1237582N and 607735E to 669923E.

Lithologies

The geology of the Four Corners deposit consists of bed clay and limestone overlain by matrix and an upper overburden horizon (Figure 6-4).

Overburden	Mostly gray to white poorly graded quartz sand with varying abundance of reworked phosphate grains. Thickness 26 to 48 ft. (7.9 to 14.6 m).	Waste
Matrix	Phosphate nodules and pellets are the dominant constituent to tan-gray to gray to gray-blue quartz sands, clays and phosphate grains and some nodules. Thickness 5 to 15 ft. (1.5 to 4.6 m).	Phosphatic
Bed Clay and Limestone	Gray to dark gray barren clays to phosphatic limestone rubble to beds of phosphatic limestone. Thickness is unknown by company exploration.	Bottom

Figure 6-4: Four Corners Bone Valley Geology Section

The overburden consists of waste sand and clayey sand that are devoid of phosphate. The wastes are generally between 26 to 48 ft. (7.9 to 14.6 m) thick. The waste is poorly graded clean rounded or sub-rounded fine sands. The waste sands near the ore body generally increase in phosphate and clay content. The waste deposit of the Bone Valley in this area is relatively thick, and the economic zone is relatively thin.

The beds of ore are in clayey and silty sands and occasionally sandy clays and silts and are tan-gray to gray-green-blue in color. The contact between waste and ore is generally distinct with an increase in clay and the presence of gray to brown to black concentrated beds of phosphatic gravels present at the contact. The beds are generally between 5 to 15 ft. (1.5 to 4.6 m) in thickness. The unconsolidated sediments contain phosphatic nodules and pellets and some phosphatic gravels. The Bone Valley consists of predominantly phosphatic pebbles and nodules and to a lesser extent grains and weathered clasts.

The basal beds are moderately consolidated gray to dark gray barren clays. There are interbeds of limestone and dolostone rubble that transitions to moderately indurated limestone and dolostone rock with phosphatic nodules and grains in the limey matrix.

A section of the Four Corners Southern Extension geology and a description of each lithology is summarized in Figure 6-5.

The waste consists of sands, clayey sands and clays that are devoid of phosphate. The overburden is poorly graded clean rounded to sub-rounded sands that increase in clay content adjacent to the ore body. The waste bed is mostly what in color. The waste bed is generally between 21 to 41 ft. (6.4 to 12.5 m) thick. There are occasionally beds of barren clay above the ore. By comparison, the overburden is relatively thin and the economic zone relatively thick.

The Undifferentiated Peace River Formation in this area of the deposit is predominantly grains and clasts with nodules and pebbles present. The first ore zone consists of tan-gray to gray-blue beds of clayey sands. The beds are generally between 13 and 26 ft. (4 to 8 m) in thickness. The contact of the overburden is usually distinct with increase in clay content and a thin bed of brown to gray phosphatic gravel but occasionally the lithology can be continuous and become devoid of phosphate. The ore zone is occasionally disrupted by beds of waste clays and silts that are not economical to mine.

The waste interbeds are more abundant in the Southern Extension. They consist of moderately consolidated green-gray or blue-gray clays and silts. They are devoid of economic phosphates. Occasionally there are marine beds of sub-rounded to sub-angular quartz sands with clasts of limestone or dolostone and are devoid of phosphate. Finally, there are isolated beds of marine limestone and dolostone. They consist of bioclasts and poorly indurated floatstone and packstone. They vary in thickness from 0 to 10 ft. (0 to 3.0 m). Local hydrogeology can cause thick beds of dolomite to spoil the underlain ore through mineral alteration.

The second ore zone consists of sandy clays and silts. These beds are green-gray to blue-gray to dark gray. They are generally between 0 to 15 ft. (0 to 4.6 m) in thickness. They have slightly elevated concentrations of limestone and dolostone clasts and gravels. Gangue minerals exist in a higher concentration and P_2O_5 in a lower concentration when compared to the Bone Valley deposit.

The basal beds are phosphatic clays sand to phosphatic sands directly overlaying limestones and dolostone gravels. These sand and gravel beds grade into beds of moderately indurated limestone and dolostone rock with phosphatic nodules and grains in the limey matrix.

Overburden	Mostly gray to white poorly graded quartz sand with varying abundance of reworked phosphate grains. Thickness 21 to 41 ft. (6.4 to 12.5 m).	Waste
Matrix	Phosphate nodules and pellets are present with phosphate grains and clasts predominate in tan-gray to gray quartz sands, clays and silts. Thickness 13 to 26 ft. (4.0 to 7.9 m).	Phosphatic
Interbedded Waste	Beds of blue to green barren sandy clays. Occasionally beds of marine limestone and dolostones or marginally phosphatic sandy beds of dolomitic clasts and grains. Thickness 0 to 10 ft. (0.0 to 3.1 m).	Waste
Matrix	Phosphate nodules and pellets are present with phosphate grains and clasts predominate in dark gray to dark gray-blue-green clays, silts with quartz sands. Thickness 0 to 15 ft. (0.0 to 4.6 m).	Phosphatic
Bed Clay and Limestone	Dark gray to black clays to phosphatic limestone rubble to beds of phosphatic limestone. Thickness is unknown by company exploration.	Bottom

Figure 6-5: Four Corners Southern Extension Geology Section

Structure

No major structures have been identified on the property from drilling and observations made during the mining process.

Alteration

Post-depositional dissolution of francolite occurs in areas throughout the deposit. Metals dissociate from the lattice structure upgrading or degrading the remaining mineral. The mineral can be upgraded by the removal of metals, namely calcium, in the natural leaching process. Dissolution of dolomitic clasts removing magnesium can also serve to upgrade the rock.

The dissolution of aluminosilicates in the waste beds can provide aluminum to substitute into the mineral and can degrade the quality of finished product. Humates present in sufficient quantities within the subsurface provide iron that can substitute into the mineral and can also degrade quality.

Mineralization

Waste material consists of quartz sand and is predominantly rounded subaerial clasts ranging in size from 0.1 to 1 mm.

The primary phosphate mineral in the Four Corners deposit is francolite. Francolite mineralization occurs by substitution of phosphorus into the carbonate minerals. These are in the form of sub-rounded to rounded clasts present as nodules, pellets, grains, bioclasts and clays ranging in size from 0.1 to 3.0 mm.

Limestone and dolostone are present as clasts and as interbeds of waste. These are usually found as rounded clasts of micritic limestone or dolostone, bioclasts, beds of poorly indurated micrite or dismicrite and beds of poorly indurated floatstone or packstone.

6.4.4 Wingate Deposit

The site geology of Wingate consists of a local basin of phosphatic ore trending north and south in the Bone Valley underlain by a broad and continuous deposit in the Hawthorn Group. The Bone Valley consistent of predominantly phosphatic pebbles and nodules and to a lesser extent grains and weathered clasts. The Hawthorn Group in this location is predominantly grains and clasts while nodules and pebbles are present. The economic mining zone thins from west to east. Near the eastern extent of the deposit there is a very narrow, north to south trending, ridge that is nearly devoid of phosphate of acceptable grade and the economic zone pinches out. Immediately east of the ridge, the deposit deepens and continues to thicken eastward. Mining began in the southwest of the deposit and has progressed towards the northeast. Phosphate grains and clasts are the predominant grain size with pebbles and nodules making up approximately 41% of the recoverable phosphate. The phosphate grains and clasts contain from 31 to 33% P_2O_5. The phosphate pebbles and nodules contain from 24 to 29% P_2O_5.

Deposit Dimensions

The Wingate deposit prior to mining, extended under the entire limits of the property, for a total 8,761 acres (3,545 hectares). The average extents of the deposit are 3 miles (4.8 km) north to south and 4 miles (6.4 km) east to west. The mineral resources and mineral reserves extend from 1141641N to 1155888N and 612046E to 632902E.

Lithologies

The geology of the Wingate deposit consists of bed clay and limestone overlain by matrix and an upper overburden horizon (Figure 6-6).

Overburden	White to tan-gray poorly graded quartz sand to brown-gray to orange iron-cemented clayey sand hardpan to tan-gray to gray clayey sands with varying abundance of reworked phosphate grains. Thickness 35 to 49 ft. (10.7 to 14.9 m).	Waste
Matrix	Tan-gray to gray clayey sands with phosphate pellets and grains to gray to gray-blue quartz sands, clays, and phosphate grains and some nodules. Thickness 19 to 37 ft. (5.8 to 11.3 m).	Phosphatic
Bed Clay and Limestone	Gray to gray-blue barren clays to phosphatic limestone rubble to beds of phosphatic limestone. Thickness is unknown by company exploration.	Bottom

Figure 6-6: Wingate Geology Section

The local overburden geology is unique at Wingate and frequently consists of cemented sediments. These hardpan sediments are the result of humates that act as a mining challenge related to the removal of overburden and serve to increase the local iron content in the underlining phosphatic ore. Drilling campaigns using SPT and reporting from core drilling are used to define and mitigate the risk. Pre-stripping plans are developed if the waste material is deemed to be problematic. This hardpan is localized in the contemporary soil horizon and can be stripped easily by excavator from natural grade.

The overburden below the zone of cementation consists of well sorted quartz sand with some silts and clays. There are beds of sandy clays and silts.

The economic zone is predominantly phosphatic grains and clasts with nodules and pebbles present. The zone consists of tan-gray to gray beds of clayey sands. The beds are generally between 19 and 37 feet in thickness. The economic contact is gradational and indistinct. The ore zone is occasionally disrupted by beds of waste clays and silts that are not economical to mine. These beds are mined if it is necessary for efficient and effective mining.

The basal beds are phosphatic clays sand to phosphatic sands directly overlaying limestones and dolostone gravels. These sand and gravel beds grade to beds of moderately indurated limestone and dolostone rock with phosphatic nodules and grains in the limey matrix.

Structure

No major structures have been identified on the property from drilling and observations made during the mining process.

Alteration

Post-depositional dissolution of francolite occurs in areas throughout the deposit. Metals dissociate from the lattice structure upgrading or degrading the remaining mineral. The mineral can be upgraded by the removal of metals, namely calcium, in the natural leaching process. Dissolution of dolomitic clasts removing magnesium can also serve to upgrade the rock.

The dissolution of aluminosilicates in the waste beds can provide aluminum to substitute into the mineral and can degrade the quality of finished product. Humates present in sufficient quantities within the subsurface provide iron that can substitute into the mineral and can also degrade quality.

Mineralization

Waste material consists of quartz sand and is predominantly rounded subaerial clasts ranging in size from 0.1 to 1 mm.

The primary phosphate mineral in the Four Corners deposit is francolite. Francolite mineralization occurs by substitution of phosphorus into the carbonate minerals. These are in the form of sub-rounded to rounded clasts present as nodules, pellets, grains, bioclasts and clays ranging in size from 0.1 to 3.0 mm.

Limestone and dolostone are present as clasts and as interbeds of waste. These are usually found as rounded clasts of micritic limestone or dolostone, bioclasts, beds of poorly indurated micrite or dismicrite and beds of poorly indurated floatstone or packstone.

6.4.5 DeSoto Deposit

The DeSoto deposit consists of 48 to 60 ft. (3.4 to 12.8 m) of tan to tan-gray sand to clayey material overlaying the Hawthorn Group. The deposit is a broad basin of phosphatic material and is bowl-like in character. Beds containing ore are generally stable in thickness. The ore is hosted in the Hawthorn Group and consists of 10 to 26 ft. (3.3 to 7.9 m) of tan-gray to gray clayey quartz sands. Phosphate grains and clasts are the predominant grain size with pebbles and nodules making up approximately 10% of the recoverable phosphate. The phosphate grains and clasts contain from 30 to 35% P_2O_5. The phosphate pebbles and nodules contain from 23 to 31% P_2O_5. The bed material is green to dark gray barren sandy clay to limestone or dolostone.

Deposit Dimensions

The DeSoto deposit extends the entirety of the property with an area of 43,064 acres (17,427 hectares). The average extents of the deposit are 11 miles (17.7 km) north to south and 14 miles (22.5 km) east to west. The mineral reserves extend from 1034128N to 1091901N and 609470E to 685858E.

Lithologies

The geology of the DeSoto deposit consists of bed clay and limestone overlain by matrix and an upper overburden horizon (Figure 6-7).

Overburden	Mostly gray to white poorly graded quartz sand with varying abundance of reworked phosphate grains. Thickness 18 to 32 ft. (5.5 to 9.8 m).	Waste
Matrix	Phosphate grains dominant constituent with some nodules and pellets to tan-gray to gray quartz sands, clays. Thickness 11 to 28 ft. (3.4 to 8.5 m).	Phosphatic
Bed Clay and Limestone	Gray to green-blue-dark gray barren clays to phosphatic limestone rubble to beds of phosphatic limestone. Thickness is unknown by company exploration.	Bottom

Figure 6-7: DeSoto Geology Section

Structure

No major structures have been identified on the property from drilling and observations made during the mining process.

Alteration

Post-depositional dissolution of francolite occurs in areas throughout the deposit. Metals dissociate from the lattice structure upgrading or degrading the remaining mineral. The mineral can be upgraded by the removal of metals, namely calcium, in the natural leaching process. Dissolution of dolomitic clasts removing magnesium can also serve to upgrade the rock.

The dissolution of aluminosilicates in the waste beds can provide aluminum to substitute into the mineral and can degrade the quality of finished product. Humates present in sufficient quantities within the subsurface provide iron that can substitute into the mineral and can also degrade quality.

Mineralization

Waste material consists of quartz sand and is predominantly rounded subaerial clasts ranging in size from 0.1 to 1 mm.

The primary phosphate mineral in the DeSoto deposit is francolite. Francolite mineralization occurs by substitution of phosphorus into the carbonate minerals. These are in the form of sub-rounded to rounded clasts present as nodules, pellets, grains, bioclasts and clays ranging in size from 0.1 to 3.0 mm.

Limestone and dolostone are present as clasts and as interbeds of waste. These are usually found as rounded clasts of micritic limestone or dolostone, bioclasts, beds of poorly indurated micrite or dismicrite and beds of poorly indurated floatstone or packstone.

6.4.6 Pioneer Deposit

The Pioneer deposit consists of 21 to 45 ft. (6.4 to 13.7 m) of tan to tan-gray sand to clayey material overlaying the Hawthorn Formation. The deposit is a series of marine beds that dip gently to the west. The beds of waste thicken from east to west. The ore is hosted in Hawthorn Formation and consists of 14 to 38 ft. (4.3 to 11.6 m) of tan-gray to gray clayey quartz sands. Phosphate grains and clasts are the predominant grain size with pebbles and nodules making up approximately 43% of the recoverable phosphate. The phosphate grains and clasts contain from 28 to 36% P_2O_5. The phosphate pebbles and nodules contain from 24 to 29% P_2O_5. The bed material is green to dark gray barren sandy clay to limestone or dolostone.

Deposit Dimensions

The Pioneer deposit extends under the entirety of the property with an area of 26,017 acres (10,529 hectares). The average extents of the deposit are 6 miles (9.7 km) north to south and 11 miles (17.7 km) east to west. The mineral reserves extend from 1111958N to 1144215N and 643188E to 701797E.

Lithologies

The geology of the Pioneer deposit consists of bed clay and limestone overlain by matrix and an upper overburden horizon (Figure 6-8).

Overburden	Mostly gray to tan poorly graded quartz sand with varying abundance of reworked phosphate grains. Thickness 21 to 45 ft. (7.6 to 13.7 m).	Waste
Matrix	Phosphate nodules and pellets phosphate grains and clasts are roughly equal in proportions in tan-gray to gray to gray-blue quartz sands, silts and clays. Thickness 14 to 38 ft. (4.3 to 11.6 m).	Phosphatic
Bed Clay and Limestone	Gray-green to dark gray barren clays to phosphatic limestone rubble to beds of phosphatic limestone. Thickness is unknown by company exploration.	Bottom

Figure 6-8: Pioneer Geology Section

Structure

No major structures have been identified on the property from drilling and observations made during the mining process.

Alteration

Post-depositional dissolution of francolite occurs in areas throughout the deposit. Metals dissociate from the lattice structure upgrading or degrading the remaining mineral. The mineral can be upgraded by the removal of metals, namely calcium, in the natural leaching process. Dissolution of dolomitic clasts removing magnesium can also serve to upgrade the rock.

The dissolution of aluminosilicates in the waste beds can provide aluminum to substitute into the mineral and can degrade the quality of finished product. Humates present in sufficient quantities within the subsurface provide iron that can substitute into the mineral and can also degrade quality.

Mineralization

Waste material consists of quartz sand and is predominantly rounded subaerial clasts ranging in size from 0.1 to 1 mm.

The primary phosphate mineral in the Pioneer deposit is francolite. Francolite mineralization occurs by substitution of phosphorus into the carbonate minerals. These are in the form of sub-rounded to rounded clasts present as nodules, pellets, grains, bioclasts and clays ranging in size from 0.1 to 3.0 mm.

Limestone and dolostone are present as clasts and as interbeds of waste. These are usually found as rounded clasts of micritic limestone or dolostone, bioclasts, beds of poorly indurated micrite or dismicrite and beds of poorly indurated floatstone or packstone.

6.4.7 South Pasture Deposit

The South Pasture deposit consists of 17 to 37 ft. (5.2 to 11.3 m) of tan to tan-gray sand to clayey material overlaying the Hawthorn Formation. The deposit is a series of marine beds that dip gently to the west. The ore is hosted in the Hawthorn Formation and consists of two distinct phosphate bearing zones interrupted by a zone of interburden. The upper economic zone is 13 to 27 ft. (4.0 to 8.2 m) of tan-gray to gray-blue clayey quartz sands. The interbedded waste is 0 to 13 ft. (0.0 to 4.0 m) of blue to green smectite clays that are devoid of phosphate. The interbeds often include, and are occasionally completely comprised of, beds of poorly indurated clastic limestone and diagenetic residuum and/or various clastic lime mud clays with or without phosphates. The lower economic zone is 0 to 14 ft. (0 to 4.3 m) of dark gray to gray-blue-green clayey quartz sands. The lower beds' lithology is continual but due to increased magnesium and decreased grade the beds are routinely not economical. Phosphate grains and clasts are the predominant grain size with pebbles and nodules making up approximately 30% of the recoverable phosphate. The phosphate grains and clasts contain from 31 to 34% P_2O_5. The phosphate pebbles and nodules contain from 27 to 31% P_2O_5. The bed material is green to dark gray barren sandy clay to limestone or dolostone.

Deposit Dimensions

The South Pasture mineralization extends under the entirety of the property with an area of 38,723 acres (15,671 hectares). The average extents of the deposit are 12 miles (19.3 km) north to south and 8 miles (12.9 km) east to west. The mineral resources extend from 1134609N to 1200386N and 665102E to 706884E.

Lithologies

The geology of the South Pasture deposit consists of bed clay and limestone overlain by matrix and an upper overburden horizon (Figure 6-9).

Overburden	Mostly tan-gray to gray poorly graded quartz sand with varying abundance of reworked phosphate grains. Thickness 17 to 37 ft. (5.2 to 11.3 m).	Waste
Matrix	Phosphate nodules and pellets are present with phosphate grains and clasts predominate in tan-gray to gray-blue quartz sands, clays and silts. Thickness 13 to 27 ft. (4.0 to 8.2 m).	Phosphatic
dded te	Beds of blue to green barren sandy clays. Occasionally beds of marine limestone and	te

Interbed Wast	dolostones or marginally phosphatic sandy beds of dolomitic clasts and grains. Thickness 0 to 13 ft. (0.0 to 4.0 m).	Wast
Matrix	Phosphate nodules and pellets are present with phosphate grains and clasts predominate in dark gray to dark gray-blue-green clays and silts with quartz sands. Thickness 0 to 14 ft. (0.0 to 4.3 m).	Phosphatic
Bed Clay and Limestone	Dark gray to black clays to phosphatic limestone rubble to beds of phosphatic limestone. Thickness is unknown by company exploration.	Bottom

Figure 6-9: South Pasture Geology Section

At South Pasture, the waste consists of sands, clayey sands and clays that are devoid of phosphate. The overburden is poorly graded clean rounded to sub-rounded sands that increase in clay content adjacent to the ore body. The beds are generally between 17 to 37 ft. (5.2 to 11.3 m) thick. The wastes are tan-gray to gray in color. There are occasionally beds of barren clay above the ore.

The Hawthorn Formation in this portion of the deposit is predominantly grains and clasts with nodules and pebbles present. The first ore zone consists of tan-gray to gray-blue beds of clayey sands. The beds range from 13 to 27 ft. (4.0 to 8.2 m) in thickness. The contact of the overburden is usually distinct with increase in clay content and a thin bed of brown to gray phosphatic gravel but occasionally the lithology can be continuous and become devoid of phosphate. The mineralization is occasionally disrupted by beds of waste clays and silts that are not economical to mine.

The waste interbeds are more abundant in the Southern Extension. They consist of moderately consolidated green-gray or blue-gray clays and silts. They are devoid of economic phosphates. Occasionally there are marine beds of sub-rounded to sub-angular quartz sands with clasts of limestone or dolostone and are devoid of phosphate. Finally, there are isolated beds of marine limestone and dolostone. They consist of bioclasts and poorly indurated floatstone and packstone. The isolated beds vary in thickness from 0 to 13 ft. (0.0 to 4.0 m). Local hydrogeology can cause thick beds of dolomite to spoil the underlain ore through mineral alteration.

The second ore zone consists of sandy clays and silts. These beds are green-gray to blue-gray to dark gray. They are generally between 0 to 14 ft. (0.0 to 4.3 m) in thickness. They have slightly elevated concentrations of limestone and dolostone clasts and gravels.

The basal beds are phosphatic clays sand to phosphatic sands directly overlaying limestones and dolostone gravels. These sand and gravel beds grade to beds of moderately indurated limestone and dolostone rock with phosphatic nodules and grains in the limey matrix.

Structure

No major structures have been identified on the property from drilling and observations made during the mining process.

Alteration

Post-depositional dissolution of francolite occurs in areas throughout the deposit. Metals dissociate from the lattice structure upgrading or degrading the remaining mineral. The mineral can be upgraded by the removal of metals, namely calcium, in the natural leaching process. Dissolution of dolomitic clasts removing magnesium can also serve to upgrade the rock.

The dissolution of aluminosilicates in the waste beds can provide aluminum to substitute into the mineral and can degrade the quality of finished product. Humates present in sufficient quantities within the subsurface provide iron that can substitute into the mineral and can also degrade quality.

Mineralization

Waste material consists of quartz sand and is predominantly rounded subaerial clasts ranging in size from 0.1 to 1 mm.

The primary phosphate mineral in the South Pasture deposit is francolite. Francolite mineralization occurs by substitution of phosphorus into the carbonate minerals. These are in the form of sub-rounded to rounded clasts present as nodules, pellets, grains, bioclasts, and clays ranging in size from 0.1 to 3.0 mm.

Limestone and dolostone are present as clasts and as interbeds of waste. These are usually found as rounded clasts of micritic limestone or dolostone, bioclasts, beds of poorly indurated micrite or dismicrite and beds of poorly indurated floatstone or packstone.

7.0 Exploration

7.1 Exploration

7.1.1 Grids and Surveys

Mine grids have been established at each of the three mines and three exploration properties based on local UTM coordinates.

7.1.2 Geological Mapping, Geochemistry and Geophysics

Geologic contour maps of depths, grades, impurities and concentration are produced using core data to increase understanding of the deposit as well as identify areas of inconsistency that would require additional drilling to better define any variations. These maps are also used when developing plans for mining. Contour maps are updated annually (or as needed) to include new drilling.

No geochemical and geophysical surveys have been completed at the active phosphate mining facilities and none are planned for the exploration properties.

7.1.3 Petrology, Mineralogy, and Research Studies

Throughout the history of mining in the Central Florida Phosphate District, many studies have taken place on various geologic topics. The scopes have ranged from general in "The Phosphate Deposits of Florida" in 1915, to more refined topics as in "Mineralogy and Alteration of the Phosphate Deposits of Florida" in 1990, and to specific locations such as "The Mineral Characteristics and Geochemistry of the Florida Phosphate of Four Corners and Hardee County Mines" in 2016.

7.1.4 Exploration Potential

There is no exploration potential within current properties. Additional mineral resources are usually obtained by acquisition of adjacent properties. These adjacent properties (Section 24) are usually drilled to confirm the viability of any mineral resource prior to acquisition.

7.2 Drilling

7.2.1 Overview

Exploration drilling commenced in earnest at varying times across the different properties. Overall exploration drilling began in the middle of the twentieth century at each property using mud rotary core drilling and has continued through as late as 1995 at the active sites and exploration properties. Exploration drilling is still underway at the future mining properties. Drilling has been performed by in-house and contract drill crews and geologists.

Definition drilling is commonly undertaken in a phased process of increasing hole density until a "full" pattern of one hole per 2.5 acres. Additional drilling is done on an as-needed basis. In addition to routine drilling certain holes are selected for "expanded" processing that includes additional metals and size fraction analysis. These holes are used to explore for the existence of heavy metals and other impurities in the ore body that can cause processing difficulties. The additional size fractions allow us to better understand the physical makeup of the ore body.

Drilling completed after the exploration phase at each facility and property is classified as definition drilling. This drilling is completed to improve the confidence classification of the mineral resource estimates through increased drill hole density.

7.2.2 Property Drilling

7.2.2.1 South Fort Meade Facility

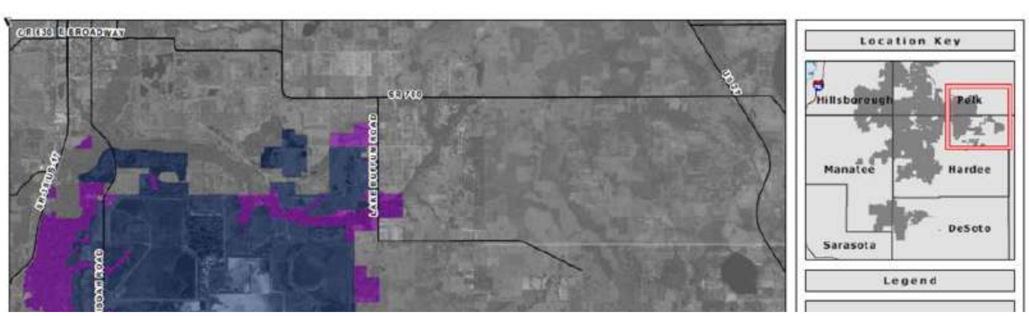
A total of 9,240 holes have been drilled at South Fort Meade yielding a total of 346,447 ft. (105,840 m) of drilling (Table 7-1). Figure 7-1 shows the collar locations of the drill holes considered for current geological interpretations, modeling and mineral resource estimation.

Drill holes not included in the modeling for mineral resource estimation are holes that do not have useable locations, or have data that has not been verified and is considered unreliable. These hole locations are placed on a redrill pattern and drilled again when time permits.

The total number of holes that have been redrilled is 171 representing a total footage of 7,735 ft. (2,358 m). This is approximately 2.4% of the total property drilled footage.

Table 7-1: South Fort Meade Facility Exploration and Definition Drilling Summary

Year Drilled	Purpose	Total Holes	Total Depth (ft.)	Total Depth (m)
Pre 1995	Exploration	2,624	87,975	26,815
1995 to 1999	Definition	2,161	86,789	26,453
2000 to 2004	Definition	1,439	53,486	16,303
2005 to 2009	Definition	313	11,788	3,593
2010 to 2014	Definition	1,114	40,779	12,429
2015	Definition	47	1,663	507
2016	Definition	153	6,726	2,050
2017	Definition	481	12,697	3,870
2018	Definition	56	2,864	873
2019	Definition	285	12,035	3,668
2020	Definition	49	1,912	583
2021	Definition	362	19,215	5,857
2022	Definition	156	8,518	2,839
Total		**9,240**	**346,447**	**105,840**



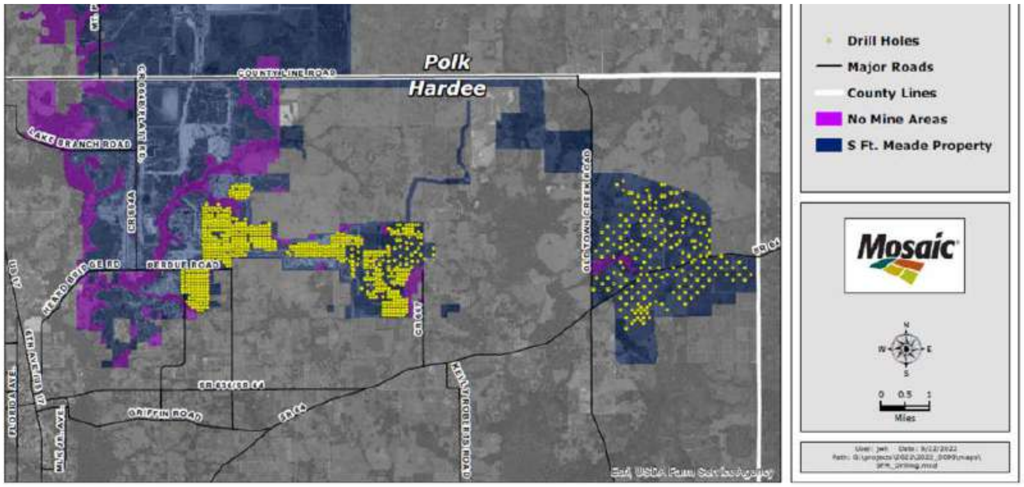


Figure 7-1: South Fort Meade Facility Drill Collar Location Plan

The drill holes shown in Figure 7-1 were used in the mineral resource and mineral reserve estimation process.

Data that is not considered in the mineral resource and mineral reserve estimation process includes data that cannot be mapped, data that has missing densities and data that has come from unverified sources through acquisition or other means. These concerns have been addressed and the data has been identified in the database.

The total number of holes that have been excluded from the 2022 mineral resource estimate is 20 representing a total footage of 892 ft. (272 m). This is approximately 0.9% of the total drilled footage supporting the 2022 estimates.

7.2.2.2 Four Corners Facility

A total of 38,231 holes have been drilled at Four Corners yielding a total of 2,032,939 ft. (619,796 m) of drilling (Table 7-2). Figure 7-2 shows the collar locations of the drill holes considered for current geological interpretations, modeling and mineral resource estimation.

Drill holes not included in the modeling for mineral resource estimation are holes that do not have useable locations, or have data that has not been verified and is considered unreliable. These hole locations are placed on a redrill pattern and drilled again when time permits.

The total number of holes that have been redrilled is 157 representing a total footage of 14,819 ft. (4,517 m). This is approximately 0.7% of the total property drilled footage.

Table 7-2: Four Corners Facility Exploration and Definition Drilling Summary

Year Drilled	Purpose	Total Holes	Total Depth (ft.)	Total Depth (m)
Pre 1985	Exploration	19,097	949,983	289,555
1985 to 1989	Definition	2,701	117,734	35,885
1990 to 1994	Definition	3,256	181,829	55,421
1995 to 1999	Definition	4,121	207,522	63,253
2000 to 2004	Definition	2,975	165,315	50,388
2005 to 2009	Definition	2,744	169,796	51,754
2010 to 2014	Definition	1,987	154,299	47,030
2015	Definition	351	22,629	6,897
2016	Definition	410	26,006	7,927
2017	Definition	76	5,528	1,685
2018	Definition	159	9,653	2,942
2019	Definition	28	2,217	676
2020	Definition	43	3,677	1,121
2021	Definition	130	11,298	3,444
2022	Definition	153	5,453	1,818
Total		**38,231**	**2,032,939**	**619,796**

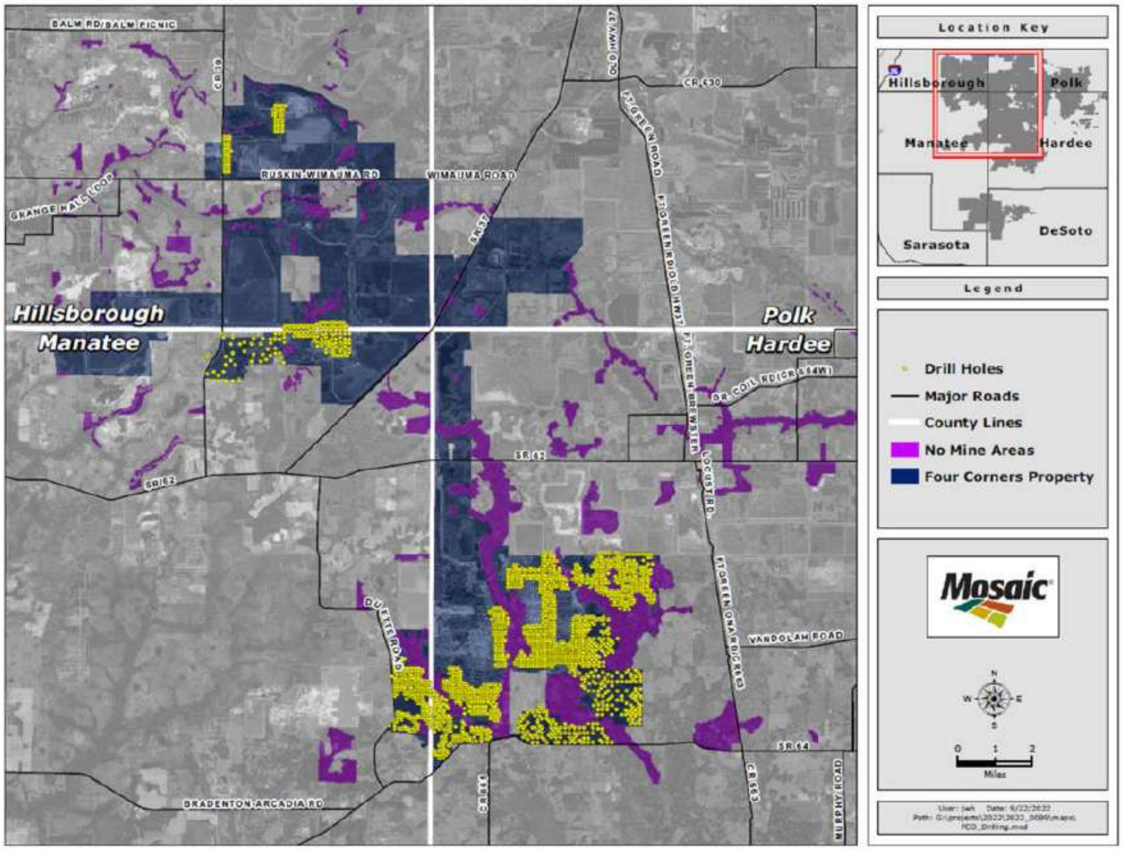


Figure 7-2: Four Corners Facility Drill Collar Location Plan

The drill holes shown in Figure 7-2 were used in the mineral resource and mineral reserve estimation process.

Data that is not considered in the mineral resource and mineral reserve estimation process includes data that cannot be mapped, data that has missing densities and data that has come from unverified sources through acquisition or other means. These concerns have been addressed and the data has been identified in the database.

The total number of holes that have been excluded from the 2022 mineral resource estimate is 139 representing a total footage of 12,989 ft. (3,959 m). This is approximately 1.5% of the total drilled footage supporting the 2022 estimates.

7.2.2.3 Wingate Facility

A total of 1,671 holes have been drilled at Wingate yielding a total of 145,317 ft. (44,375m) of drilling (Table 7-3). Figure 7-3 shows the collar locations of the drill holes considered for current geological interpretations, modeling and mineral resource estimation.

Drill holes not included in the modeling for mineral resource estimation are holes that do not have useable locations, or have data that has not been verified and is considered unreliable. These hole locations are placed on a redrill pattern and drilled again when time permits.

The total number of holes that have been redrilled is 240 representing a total footage of 21,534 ft. (2,483 m). This is approximately 15.5% of the total property drilled footage.

Table 7-3: Wingate Facility Exploration and Definition Drilling Summary

Year Drilled	Purpose	Total Holes	Total Depth (ft.)	Total Depth (m)
Pre 1980	Exploration	21	1,410	430
1980 to 1989	Definition	6	469	143
1990 to 1999	Definition	102	8,812	2,686
2000 to 2009	Definition	635	58,300	17,770
2010 to 2014	Definition	609	50,814	15,488
2015	Definition	49	4,419	1,347
2016	Definition	60	4,254	1,297
2017	Definition	19	1,400	427
2018	Definition	7	654	199
2019	Definition	64	5,394	1,644
2020	Definition	41	4,477	1,365
2021	Definition	24	2,048	624
2022	Definition	34	2,866	955
Total		**1,671**	**145,317**	**44,375**

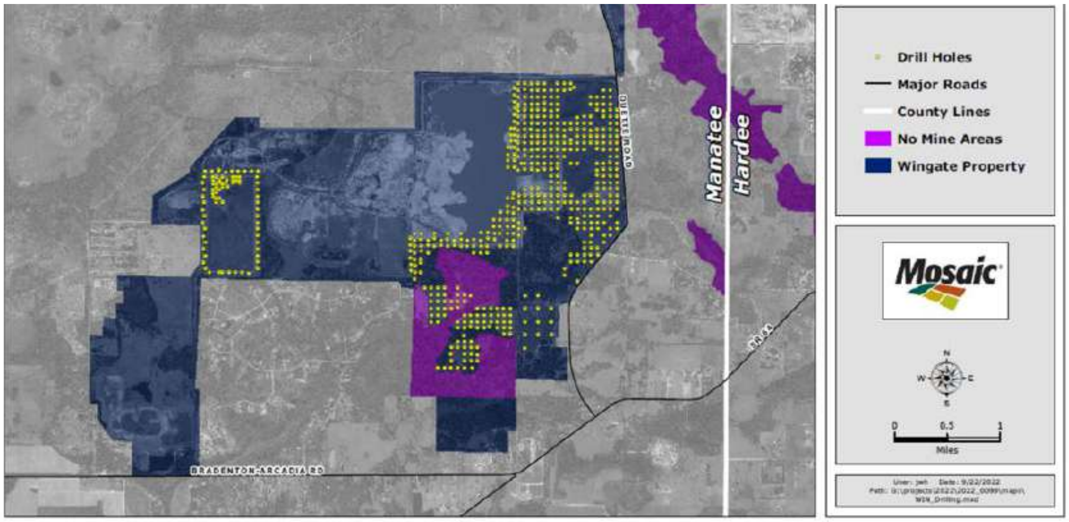


Figure 7-3: Wingate Facility Drill Collar Location Plan

The drill holes shown in Figure 7-3 were used in the mineral resource and mineral reserve estimation process.

Data that is not considered in the mineral resource and mineral reserve estimation process includes data that cannot be mapped, data that has missing densities and data that has come from unverified sources through acquisition or other means. These concerns have been addressed and the data has been identified in the database.

The total number of holes that have been excluded from the 2022 mineral resource estimate is 60 representing a total footage of 4,953 ft. (1,510 m). This is approximately 6.2% of the total drilled footage supporting the 2022 estimates.

7.2.2.4 DeSoto Property

A total of 2,950 holes have been drilled at the DeSoto property yielding a total of 160,603 ft. (48,952 m) of drilling (Table 7-4). Figure 7-4 shows the collar locations of the drill holes considered for current geological interpretations, modeling and mineral resource estimation.

Drill holes not included in the modeling for mineral resource estimation are holes that do not have useable locations, or have data that has not been verified and is considered unreliable. These hole locations are placed on a redrill pattern and drilled again when time permits.

The total number of holes that have been redrilled is 7 representing a total footage of 378 ft. (115 m). This is approximately 0.2% of the total property drilled footage.

Table 7-4: DeSoto Property Exploration and Definition Drilling Summary

Year Drilled	Purpose	Total Holes	Total Depth (ft.)	Total Depth (m)
Pre 1970	Exploration	274	21,995	6,704
1970 to 1979	Exploration	596	42,609	12,987
1980 to 1989	Exploration	0	0	0
1990 to 1999	Exploration	1,813	80,619	24,573
2000 to 2009	Exploration	14	590	180
2010 to 2014	Exploration	0	0	0
2015	Exploration	0	0	0
2016	Exploration	0	0	0
2017	Exploration	253	14,790	4,508
2018	Exploration	0	0	0
2019	Exploration	0	0	0
2020	Exploration	0	0	0
2021	Exploration	0	0	0
2022	Exploration	0	0	0
Total		**2,950**	**160,603**	**48,952**

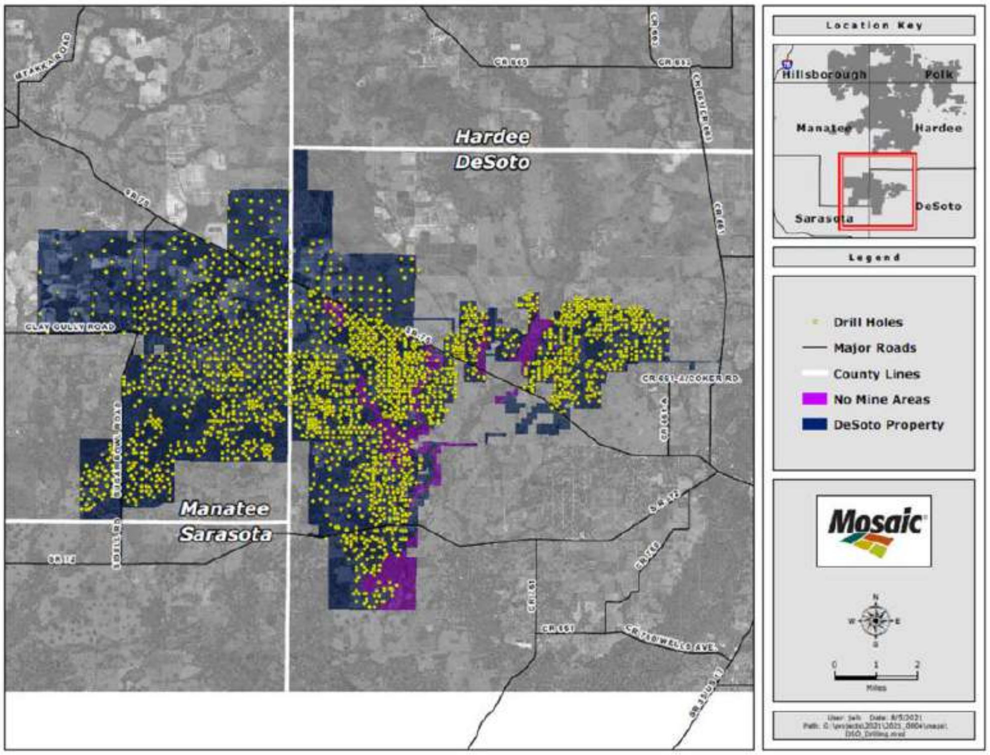


Figure 7-4: DeSoto Property Drill Collar Location Plan

The drill holes shown in Figure 7-4 were used in the mineral resource estimation process.

Data that is not considered in the mineral resource and mineral reserve estimation process includes data that cannot be mapped, data that has missing densities and data that has come from unverified sources through acquisition or other means. These concerns have been addressed and the data has been identified in the database.

The total number of holes that have been excluded from the 2022 mineral resource estimate is 179 representing a total footage of 13,679 ft. (4,169 m). This is approximately 2.8% of the total drilled footage supporting the 2022 estimates.

7.2.2.5 Pioneer Property

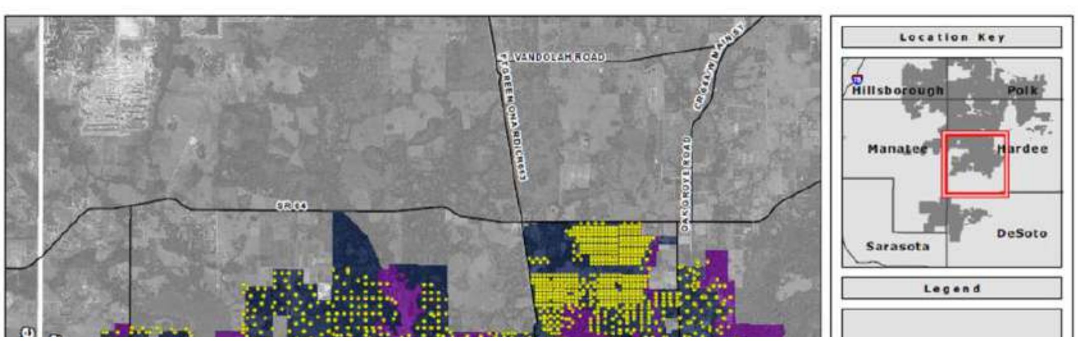
A total of 2,984 holes have been drilled at Pioneer yielding a total of 230,425 ft. (70,223 m) of drilling (Table 7-5). Figure 7-5 shows the collar locations of the drill holes considered for current geological interpretations, modeling and mineral resource estimation.

Drill holes not included in the modeling for mineral resource estimation are holes that do not have useable locations, or have data that has not been verified and is considered unreliable. These hole locations are placed on a redrill pattern and drilled again when time permits.

The total number of holes that have been redrilled is 35 representing a total footage of 2,797 ft. (853 m). This is approximately 1.2% of the total property drilled footage.

Table 7-5: Pioneer Property Exploration and Definition Drilling Summary

Year Drilled	Purpose	Total Holes	Total Depth (ft.)	Total Depth (m)
Pre 1970	Exploration	536	24,142	7,358
1970 to 1979	Definition	1,414	121,024	36,888
1980 to 1989	Definition	466	32,427	9,884
1990 to 1999	Definition	160	15,926	4,854
2000 to 2009	Definition	406	36,812	11,220
2010 to 2014	Definition	2	94	29
2015	Definition	0	0	0
2016	Definition	0	0	0
2018	Definition	0	0	0
2019	Definition	0	0	0
2020	Definition	0	0	0
2021	Definition	0	0	0
2022	Definition	0	0	0
Total		**2,984**	**230,425**	**70,233**



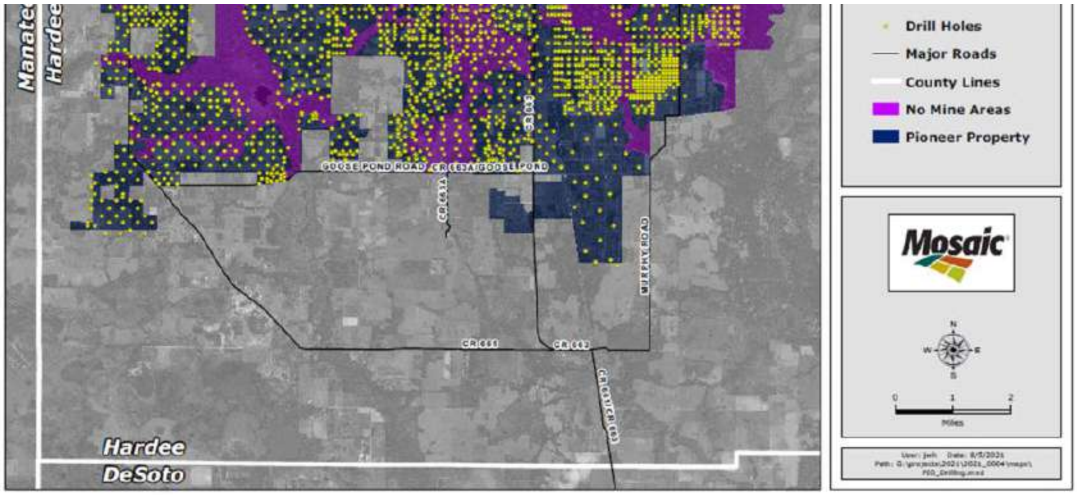


Figure 7-5: Pioneer Property Drill Collar Location Plan

The drill holes shown in Figure 7-5 were used in the mineral resource estimation process.

Data that is not considered in the mineral resource and mineral reserve estimation process includes data that cannot be mapped, data that has missing densities and data that has come from unverified sources through acquisition or other means. These concerns have been addressed and the data has been identified in the database.

The total number of holes that have been excluded from the 2022 mineral resource estimate is 4 representing a total footage of 229 ft. (70 m). This is approximately 0.1% of the total drilled footage supporting the 2022 estimates.

7.2.2.6 South Pasture Property

A total of 9,936 holes have been drilled at South Pasture yielding a total of 569,474 ft. (173,575 m) of drilling (Table 7-6). Figure 7-6 shows the collar locations of the drill holes considered for current geological interpretations, modeling and mineral resource estimation.

Drill holes not included in the modeling for mineral resource estimation are holes that do not have useable locations, or have data that has not been verified and is considered unreliable. These hole locations are placed on a redrill pattern and drilled again when time permits.

The total number of holes that have been redrilled is 1,938 representing a total footage of 8,507 ft. (2,593 m). This is approximately 1.5% of the total property drilled footage.

Table 7-6: South Pasture Property Exploration and Definition Drilling Summary

Year Drilled	Purpose	Total Holes	Total Depth (ft.)	Total Depth (m)
Pre 1995	Exploration	4,258	238,915	72,821
1995 to 1999	Definition	1,760	92,805	28,287
2000 to 2004	Definition	882	52,062	15,868
2005 to 2009	Definition	1,038	58,893	17,951
2010 to 2014	Definition	643	44,385	13,529
2015	Definition	486	34,171	10,415
2016	Definition	357	20,267	6,177
2017	Definition	278	14,073	4,289
2018	Definition	115	6,943	2,116
2019	Definition	36	2,240	683
2020	Definition	83	4,720	1,439
2021	Definition	0	0	0
2022	Definition	0	0	0
Total		**9,936**	**569,474**	**173,575**

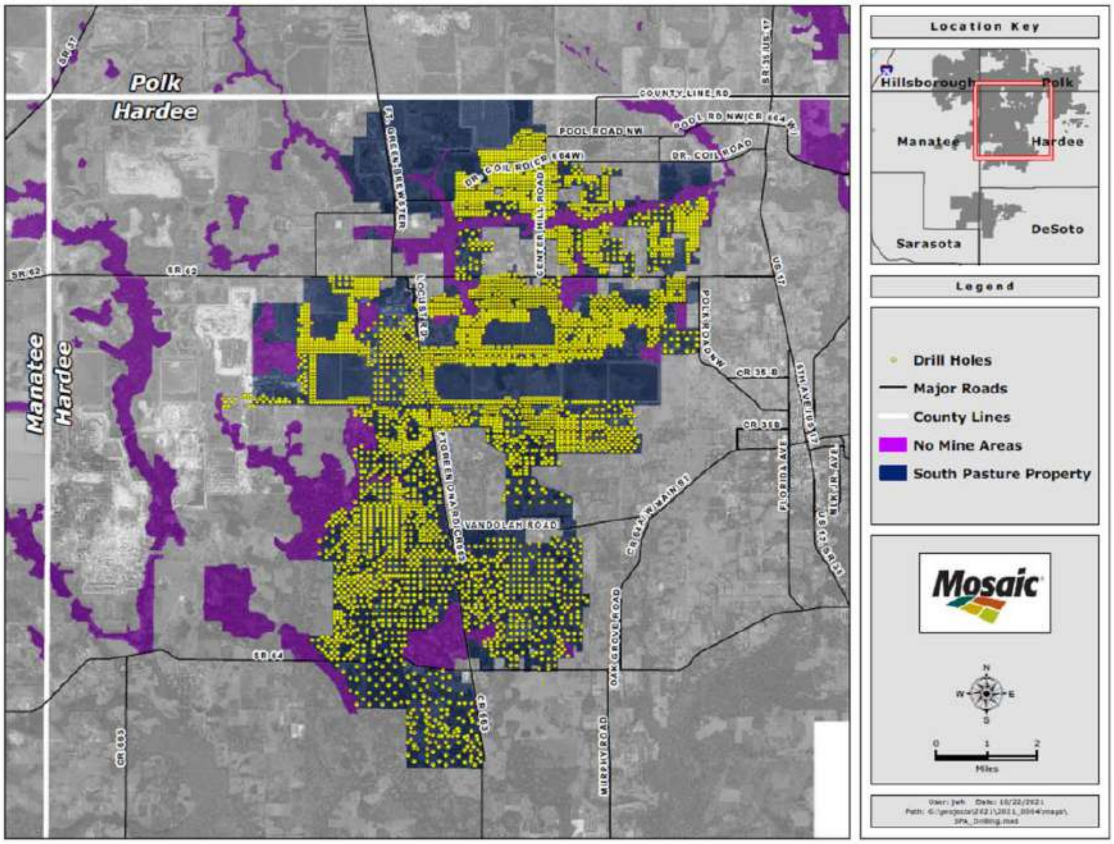


Figure 7-6: South Pasture Property Drill Collar Location Plan

The drill holes shown in Figure 7-6 were used in the mineral resource estimation process.

Data that is not considered in the mineral resource and mineral reserve estimation process includes data that cannot be mapped, data that has missing densities and data that has come from unverified sources through acquisition or other means. These concerns have been addressed and the data has been identified in the database.

The total number of holes that have been excluded from the 2022 mineral resource estimate is 133 representing a total footage of 10,661 ft. (3,249 m). This is approximately 5.1% of the total drilled footage supporting the 2022 estimates.

7.2.3 Drill Methods

Drilling at all sites is completed using a Failings 1250 Mud Rotary unit that uses bentonite slurry and positive hydrologic head to maintain hole stability. A 10 ft. (3 m) long and four-inch diameter core barrel is used to collect in-situ samples in runs of 2 to 8 ft. (0.6 to 2.4 m). Negative pressure within the barrel occurs as the sample is retrieved and slurry is forced out the top of the drill stem. The vacuum that forms is employed to hold the core sample in the barrel as it is removed for the hole after each run. Once the barrel is safely removed from the hole a pump is used to fill the barrel with slurry to push the sample out of the bottom of the barrel. As the sample is removed it is placed in boxes in lengths of up to 5 ft. (1.5 m).

7.2.4 Geological Logging

Each drill hole is logged in the field as it is drilled using a Mosaic customized logging sheet that feeds into the Mosaic master database. This is done by either a Mosaic or contract geologist that also accompanies and directs the drill crew.

The logging geologist makes general notes on the overburden lithologies by viewing the cuttings and overburden core samples. During this process the depth and general firmness of any "hardpan" is noted as well as any remarkable observations. Core samples are collected of the overburden to ensure that the contact with the mineralization is accurately identified. Once the contact with the matrix is observed, the onsite geologist inspects each sample of matrix using a variety of methods. The samples are described based on external appearance initially. Characteristics such as color, stiffness, swell, depth and length are noted on the Mosaic customized logging sheet. The samples are then evaluated by hand using a hand lens or cutting tools to "open" the core to see the interior makeup. The visual appearance of the interior is then logged noting if the core is uniform or if there is differential layering of any kind, general abundance, size and color of phosphate product and where within the core the product lies, the type and general number of impurities. The geologist characterizes the texture of the core constituents to describe the core in further detail to note if the core is clayey, sandy, dolomitic or if it contains rubble. Also recorded is an opinion on pumping or digging difficulty. Specific features of each sample are noted and if there is a distinct transition between layers or if the deposit is uniform throughout.

Samples are logged and separated by depth and specific geologic characteristics. Each separated sample within a hole is labeled with location and unit identifiers and bagged to be taken to the onsite metallurgical and analytical lab.

Core logging is based on lithology and phosphatic abundance. It is not necessary to log lithological units and attempt to define seam conformity. The individual unit/beds generally exhibit lithological similarities across the property and region, but locally repeat in transgressive or regressive sequences. The interpretation is based on the total abundance of phosphatic material in the bed and the total phosphatic material within the borehole.

Bed geometries that are sinusoidal or in some other way skewed towards variability in grain size or material density can impact the predictive quality of data. In areas where features of this type exist the drilling density may not be sufficient to be predictive. This is only the case in fluvial deposits with phosphatic sediment loads that vary in composition over geological time and is not common.

Interbeds of limestone or dolostone can present losses of recovery when they cannot be readily cored. In some cases, well indurated interbeds need to have the cuttings flushed from cutting surface of the bit for drilling to proceed. Drilling fluid and cuttings are washed from the core barrel and pumped through the annular space of the borehole to the mud tub. It is possible that small portions of phosphatic bed above and below the interbed are poorly resolved due to material losses.

Beds of clays that are resistant to pumping are identified but the composition is poorly defined and can materially impact the mineability of the bed due to poor pumping exhibited by these materials. The geologist notes these beds and identifies and logs clays with material properties that indicate poor pumping performance.

7.2.5 Recovery

A core recovery of 90% is required for each hole. If this recovery is not met, the hole is redrilled at that time.

7.2.6 Collar Surveys and Down Hole Surveys

Prior to 2016, the collar coordinates for each hole were surveyed by Mosaic surveyors. Post 2016, LiDAR coordinates including elevations are obtained by annual flyovers done by a certified contractor.

No downhole surveys are completed since all required geological information is obtained from the drill hole logging and core samples.

7.3 Hydrogeology

There is no hydrogeological data collected at the exploration and drilling data acquisition stage. Most is collected during environmental permitting and studies. More detail is included in the environmental section.

7.4 Geotechnical

No geotechnical data is collected at the drill data acquisition stage. Geotechnical considerations are taken into account during the mining of the phosphate.

7.5 QP Interpretation of the Exploration and Drilling Information

In the opinion of the Section 7 QP, the quantity and quality of the lithological, collar and drilling data collected for all of the properties are sufficient to support mineral resource and mineral reserve estimation. The reasons for this are as follows:

- The core logging meets industry standards for this type of deposit.
- The collar surveys have been performed using industry-standard instrumentation.
- Recovery data from core drilling programs is acceptable.
- The drilling pattern and density are constant with industry standard.
- The recorded data and classification of core constituents are in line with industry practice.
- The drilling process and equipment are consistent with industry standards for this type of deposit.
- The data that is determined to be defective is not used in the estimation process.

8.0 Sample Preparation, Analyses and Security

8.1 Introduction

Mosaic owns and operates an analytical lab in Florida (A-Lab). The A-Lab is located at the Mosaic Four Corners Facility (11200 SR Hwy 37 South, Bradley, FL 33835). The A-Lab is led by a Senior Lab Supervisor and operates 24 hours/day, seven days/week in a rotating shift fashion. Each shift crew consists of a Senior Analytical Tech and two Analytical Lab Technicians.

The A-Lab provides metallurgical and analytical services, including sample preparation to all Mosaic Florida minerals operations. Additionally, Mosaic's New Wales Quality Control Lab provides analytical services when the A-Lab has an extended backlog and for periodic detection of additional metals. Both labs are owned by Mosaic and are not externally certified.

Mosaic is one of 14 member companies of the Association of Fertilizers and Phosphate Chemists (AFPC) which also includes two overseas and two associate members. The AFPC's main goal is to promote uniformity of sampling and analytical methods for the phosphate industry. The preparation and analysis of the A-Lab and New Wales Lab samples follow the protocol and the conventional methods of the industry.

The following samples are collected for preparation and analysis:

- Core samples collected from on-going drilling programs, including specific holes analyzed for additional metals and additional size fractions. The New Wales Quality Control Lab test for any additional metals.
- QA/QC core sample.
- Production samples collected after the beneficiation plant.

8.2 Sampling Methods

8.2.1 Procedures

Core samples are grouped by depth and specific geologic characteristics as logged by the onsite geologist. Each sample is bagged by hand and each bag containing part of the sample is labeled with location and unit identifiers. A sample is made up of the entire core that is logged for that thickness and geologic characteristic. All the ore for each sample is taken to the lab.

Samples are collected after logging. The ideal maximum length of an individual split is 10 ft. (3.0 m), the ideal minimum length of an individual split is 5 ft. (1.5 m) and the average split length is 6.1 ft. (1.9 m).

Each sample is labeled in the field with identification information that is specific to only that sample. At the A-Lab that sample is given an "M-Number" that is used from that point on to track the data for that specific sample through the entire process. The M-Number is also stored in the database with the analytical data.

8.2.2 Quality Control

Geologists receive onsite training for sample collection supervised by an experienced geologist. During training the geologist is provided instructions for the drilling, logging and sampling process. This supervised training occurs within comparable phosphate deposits within the Central Florida Phosphate District. The tenured geologist provides continual feedback and assesses the competencies of the geologist in training. The geologist in training is only released to work when the tenured geologist and the qualified person agree that they are proficient and capable to conduct work unsupervised.

Boreholes are located by GPS and are drilled by a mud rotary coring method. The holes are drilled with a fish tail bit through the overburden. If phosphate is noticed at any time in the cuttings by the driller or the geologist, the driller stops and core

drilling begins. In most cases, coring begins prior to phosphatic beds. If there are an abundance of phosphatic cuttings in the mud tub, the hole may be re-drilled at the geologist's discretion.

Samples are recovered from the borehole and are placed in core boxes for visual description and logging. The thicknesses and depths are recorded in the drilling log and characteristics of the sediments and the phosphates are noted in the logs. The core is assessed for recovery by comparing the recovered footage to the footage communicated by the driller. In the case of poor recovery, the drilling logs are notated and the hole is assessed for re-drilling.

The core, in its entirety, is bagged and labeled on the bag and within the bag for sample processing at the lab. To ensure core samples are properly identified and labeled the lead lab tech matches the log data to sample data. If there is a discrepancy, the onsite geologist that drilled the borehole is asked to correct it as the core is received. All core is consumed in processing and analysis.

8.3 Sample Preparation

8.3.1 Process

Sample preparation at the A-Lab follows the process outlined in Figure 8-1. There is a detailed written process manual that details each step and includes supporting photos and directions. This manual is reviewed with personnel regularly.

In general, the sample preparation process consists of the sample being weighed and placed on a rubber mat where it is disaggregated into a homogenous mixture. Two 1,000-gram moisture samples are taken from this mixture. A portion of the sample is placed in a cylinder of known volume. That portion of the sample is sent through a pilot washer. On the first part of the washer, screens separate the pebble size material. The second screen separates the feed size material from the smaller waste material. The pebble and feed material are screened at specific sizes, each sized portion is weighed, dried, ground and analyzed for specific metals and grade. The feed goes through a two-step floatation process using chemicals to separate the sand from the concentrate. The concentrate is then weighed, dried, ground and analyzed for specific metals and grade. Additionally, a portion of the waste material that passes through the feed screen is collected to be weighed, dried, ground and analyzed for specific metals and grade.

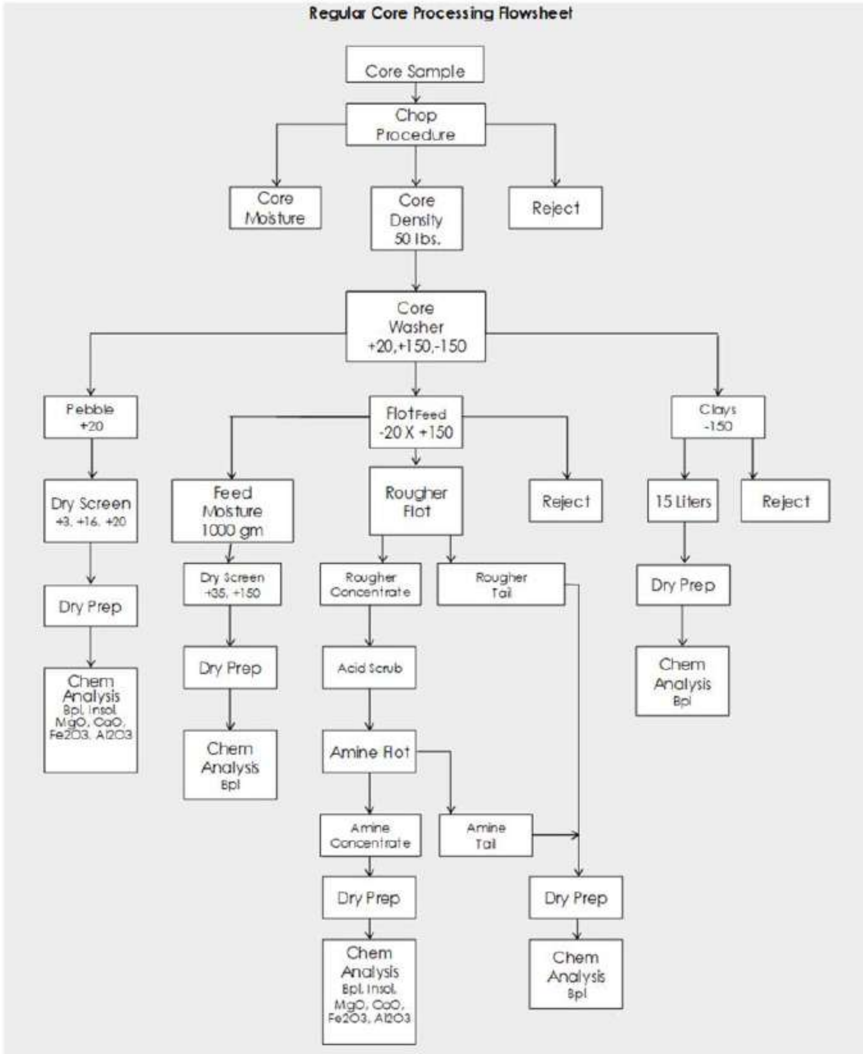


Figure 8-1: Core Sample Preparation Flow Sheet

8.3.2 Quality Control

The quality control process utilizes dual moisture samples to ensure the proper water content is used for the analysis of the samples. The weights of the samples are mass balanced to determine the volume of water in the core sample. Another process used to maintain quality is to split specific core samples into approximately equal portion and run them through the entire lab process to verify the results. The splitting of the core takes place in the field by the onsite geologist and is treated as a separate hole for production sampling.

The geologist uses a cutting tool to divide the core in the field as close to evenly as possible. The split samples are bagged separately and labeled as a QA/QC sample. The A-Lab then treats both samples as a separate core and runs them through the process to ensure accurate a comparison is made of the sampling, processing and analyzing. The results can then be reviewed for outliers and variations to adjust any part of the process that needs updating.

8.4 Assaying and Analytical Procedures

8.4.1 Procedures

The drill hole core samples are assayed for phosphorous as BPL (Bone Phosphate of Lime), acid insoluble material, metals reported in percent oxide and ground moisture to correct the BPL analysis due to sample moisture. The wet chemistry portion of the analytical lab is staffed with two lab technicians and one senior lab technician. This portion of the lab is in continuous operation and always staffed with at least two technicians.

Samples are logged into a LIMS (Laboratory Information Management System) that is used by A-Lab. LIMS manages the samples from receipt to release. The system is integrated into the Company database and all results are recorded. When the analysis is completed, the sample results are released in duplicate to other tables in the database.

Procedures for analysis of processed samples are identical for pebble, amine concentrate and clays. Each size fraction is dried and ground to a minimum of 0.25 mm. A one-gram sample of dried material is massed. The sample is digested in a solution of hydrochloric acid with heating. The samples are filtered. The insoluble particulate and filter paper are reserved. The aqueous solution undergoes analysis. The analysis uses an industry standard Scandium tracer to validate the instrument during analysis. The first and last samples of a ten-sample run are industry standard AFPC Check 22 to further validate the instrument during analysis. The insoluble material and filter paper are placed in a muffle furnace and the remaining insoluble material is massed in a controlled process to eliminate moisture fluctuations.

Flotation feeds and flotation tails are ground, massed and digested in HCL as described above. The samples are processed using the molybdovanadate and perchloric acid colorimetric method. The samples are then analyzed by Shimadzu spectrophotometer and are analyzed only for phosphorus BPL.

Additional metallurgical analysis is routinely conducted at the New Wales Analytical Lab. The samples are processed and ground by the A-Lab. The samples are transferred by contractor security personnel to the New Wales Analytical Lab and are processed using a mass spectrometer to identify additional metals.

8.4.2 Density Determinations

The density of in-situ core samples is determined by the water density method.

A sample of the disaggregated homogenized core is placed in a cylinder of known volume (sample mass and cylinder volume will vary depending on available sample size). After the sample is weighed, the cylinder is filled to capacity with water. The cylinder is then weighed again and the density is derived. The mass of the dry material in the sample is determined by multiplying the sample by the percent solids. The volume of the water in the used cylinder is determined by dividing the mass of water in the cylinder by the mass of one cubic foot of water. The volume occupied by the dry material is found by subtracting the volume of water from the cylinder size. The density of the dry material is calculated by dividing the mass of the dry material by the volume it occupies in the cylinder.

The measured density is compared to a calculated density. The calculated density is the fractional density based on the weight percent of the dry components of each sample. This density is determined by multiplying the fractional percent of each component by a standard density assuming no void. It is then factored by the amount of moisture found in the sample and a constant void factor. The new factored density is then adjusted to account for the infill of water and small particles in the interparticle space between larger particles. This adjustment is done using standard coefficients derived from statistical regression to arrive at the calculated density that is compared to the measured lab density using a range of +/- 15%.

8.4.3 Moisture Estimation

The moisture estimation process begins by collecting two approximate 1,000-gram representative samples of disaggregated and homogenized core prior to the sample density estimation process. The samples are collected from varying parts of the core to not over represent any particular portion of the core. The weights of the samples are verified using calibrated digital scales and any excess sample is removed to maintain similar weights across the samples. The samples are placed in a Grieve Oven for eight to 12 hours to dry. The samples are reweighed after drying to determine moisture mass lost. The percent moisture of each sample is calculated and mass balanced to be used in the core properties calculations. Samples are used in the percent moisture and density determination process to limit sample basis and increase accuracy.

Ground sample moisture is determined by selecting a single five-gram sample of each ground sample to be weighed and placed in an oven for one hour to dry. The samples are reweighed after drying to determine moisture mass lost.

The moisture determination process and estimation are rechecked as part of the QA/QC process. Each portion of the core selected as a QA/QC hole goes through the same procedure thereby producing four moisture samples for a single layer. The average variation between moisture samples of the same core is ~1.2%.

8.4.4 Quality Assurance and Quality Control

For QA, the A-Lab instruments are calibrated at the beginning of each BPL and metals run and when the samples are weighed for digestion, an AFPC Check 22 sample is also weighed, digested and analyzed along with the samples.

Mosaic uses industry standard sample AFPC Phosphate Rock Check No. 22 as its QA/QC reference sample. If the check assay fails (its analysis results are outside the certified value being assayed), the run is scrapped and repeated. In addition, control charts are generated from LIMS generated data to monitor BPL and metals analysis results.

The A-Lab also participates in a bimonthly round-robin check program in which 32 industry labs analyze an unknown rock sample supplied by the participating labs and report their results to AFPC. Results are tabulated and published when data analysis is completed by AFPC; each lab's results are expected to be within two standard deviations of the average of all the data.

Three instruments are used to analyze the A-Lab samples for BPL and metals. They are covered with a service agreement with the manufacturer that includes two preventive maintenance visits per year. The lab instrument technicians do routine preventive maintenance weekly and the technicians and the chemist take care of minor to moderate instrument issues. Whenever there is an instrument problem that cannot be fixed in-house by the instrument technician or chemist, the manufacturer is called to repair the units under the service agreement.

8.5 Sample Security

Core samples are logged and collected by Mosaic personnel or approved contractors. The samples are transported to the storage area at the Four Corners Facility by the same personnel.

The sample storage area is located behind the mine security gate. Only Mosaic personnel can access the storage area.

If samples are taken to an outside lab for processing, a chain of custody is established that verifies the samples are accessed only by approved personnel at specified locations throughout the core processing procedure.

8.6 Database

Drill hole collar, survey, assay and lithological data are collected from the drilling campaign, analytical laboratory and LiDAR surveys. This data is uploaded into an Oracle SQI database and available to appropriate staff through a proprietary graphical user interface. Tabular data is available to users.

- Drill hole collar elevations are measured from LiDAR data using surveyed collar locations provided by the geologist. Data is uploaded into the database from the GIS department.
- Lithological data is collected by the geologist during drilling including color, sediment makeup, degree of consolidation, phosphatic abundance and drill hole information including depth to ore, thickness of ore split and total depth. The logs are released to the analytical lab and entered into the database.
- Physical properties data is entered directly into the database. Important items are: mass of sized samples, density, percent moisture and percent clay.
- Analytical data is collected by the A-Lab LIMS system and uploaded into the secure database. Important items are: BPL, Fe_2O_3, Al_2O_3, MgO, and CaO.

8.7 QP Opinion on Sample Preparation, Security, and Analytical Procedures

It is the opinion of the Section 8 QP that the Florida phosphate mining sampling method, sample preparation and assaying and analytical procedures are suitable to support mineral resource and mineral reserve estimation. The rational for this is as follows:

- The core sampling, sample preparation, security and analytical process are conducted using industry standard procedures.
- Database maintenance and enhancements are ongoing to improve use and security and ensure the data is readily accessible for mineral resource and reserve estimation.
- The core sampling, sample preparation, security and analytical process provide the grade, volume, and qualities needed to accurately estimate mineral resource and reserve estimates.
- Quality Assurance and Quality Control processes are completed, ensuring the results are within industry standards.
- It is assumed, based on a review of existing documents and compilation reporting, that the historical core sampling, sample preparation, security and assaying processes were appropriate for the time of data collection. The majority of the historic drilling areas have been mined and through production records, the QP has gained confidence that these estimations reconcile with realized mining expectations.
- Internal sampling and laboratory procedures are standardized with the intention of providing accurate and representative samples of the material being mined.

9.0 Data Verification

9.1 QP and Internal Data Verification

When geologic data is acquired, the Mosaic Senior Reserve Analyst (QP) and A-Lab staff perform the following regular internal data validations:

- Ongoing assay data validation consisting of weight and assay checks is done using the QA/QC split core process.
- Data verification is conducted on samples using numerical methods. Statistical analysis is conducted on a representative subsample of assays to determine expected elemental ratios. The comparison of the total of assay elements to a statistically representative total of expected elements is performed. If the ratio is outside of a prescribed passing range, the assay is repeated. If the new assay falls outside of the prescribed range the data are labeled as "bad data" and the drill hole is scheduled to be drilled again.
- Each sample split with its representative series of assay values is verified by the QP or an employee working under the direction of the QP. There are "flags" that identify data that fall outside of predicted ranges during the verification process. Each split is determined to be fit for purpose and is validated manually by the qualified person or an employee working under the direction of the qualified person for use in reserve and resource estimation.
- All new assay data being added to the database is verified upon acquisition by the internal validation software.
- Prior to entry into the database to be used in mineral resource estimation, the data is reviewed for improbable entries and high values. Any errors are flagged and corrected.
- Mosaic staff regularly conducts laboratory reviews and audits of the A-Lab.
- The onsite mine geologists visit the mining areas to visually inspect the mining excavation to compare observations to the drilling data. When required, samples are collected to understand differences in grade and verify the exploration data.
- The QP visits the core logging and sampling facilities bi-annually.
- The QP has conducted discussion with past professionals and original site experts regarding historical data.

9.2 External Data Verification

The following external checks are performed:

- The equipment used for analytical purposes is calibrated on a regular basis to know standards.
- The core properties analysis from the density procedure through the analyte analysis has been duplicated by an outside lab for repeatability.
- External round-robin assay checks.
- Quarterly mineral reserve audits and depletion reviews are done by KPMG as part of their financial reviews and audits.

9.3 QP Opinion on Data Adequacy

It is the opinion of the QP that the data being used and relied upon in this Report is adequate to support mineral resource and mineral reserve estimation. The rational for this is as follows:

- There is enough drill data to produce accurate mineral resource and mineral reserve estimates.
- The data quality and quantity are aligned with industry standards.

- The verification process is adequate to validate the data used as part of the mineral resource and mineral reserve estimation process.
- The historical assay information is adequately supported by the reconciliation to actual mining results and activity.
- The exploration results have been reviewed and there is confidence in the interpretations.
- The QP has reviewed select internal reports and memos prepared by Mosaic staff and note that those reports and memos have not identified any material deficiencies with the adequacy of the data at the time this Report was prepared.

10.0 Mineral Processing and Metallurgical Testing

10.1 Introduction

Metallurgical testing and quality control are crucial to Mosaic mineral processing. Laboratory and plant tests are a necessity to support the mining and beneficiation process because of inherent limitations of online measurement of matrix quality. Draglines and dredges extract the mineralization, known as the matrix, that is approximately 1/3 clay, 1/3 sand, and 1/3 phosphate rock. If the draglines and dredges are not mining in the proper zone, the matrix quality will vary from time to time. As such, shift samples are collected from each stream and analyzed in the A-Lab to ensure operating targets are being met throughout the process and to confirm final product purity/quality.

10.2 Procedures

To support production quality, automatic samplers are installed at the beneficiation plants to collect shift samples from all streams. At the end of each shift, samples are delivered to the A-Lab for analysis.

Samples are collected by the operations group using the automatic samplers and brought to the A-Lab for analysis on a set routine. These routines have been established by each site's Engineering and Operations personnel, based on the criticality and variability of each specific stream noted over the site's decades of operation. Once the A-Lab receives the samples, the standard procedures are followed to process the samples.

The frequency of sample analysis is listed in Table 10-1.

Table 10-1: Notable Frequency of Samples

Sample Name	Frequency of Samples	Analysis Type
Pebble	Once every 3 to 4 hours based on production rate. Automatically collected samples at 15 to 20 minute intervals	Chemistry
Sizer Rock (Intermediate Pebble)	x 2 per day	Chemistry
Flotation Feed	x 2 per day	Chemistry
Flotation Rougher Concentrate	x 2 per day	Chemistry

Flotation Rougher Tail	x 2 per day	Chemistry
Final Concentrate	x 2 per day	Chemistry
Shipment	x 2 per day	Chemistry

10.3 Quality Control

For the A-Lab sample analysis, lab technicians follow the lab standard procedures to split, dry, grind and analyze each sample. The A-Lab technicians put a standard sample in each batch sample to verify the equipment's accuracy. If the lab data is questionable, production engineers will ask the A-Lab to recheck the sample.

The equipment used to analyze samples in the A-Lab has service agreements with the manufacturer that include two preventative maintenance visits per year as well as emergency visits to troubleshoot instrument issues. Routine instrument maintenance is carried out by the lab chemist and E/I team.

10.4 Database and Records

Processing related lab results are imported into a LIMS (Lab Information Management System), that feeds the site's larger reporting-based database. Shipping related lab results are entered into a PLS (Product Loading System) system, that creates a history of the values and provides a certificate of analysis to customers through Mosaic's SAP billing system. Production data is saved into a database. Almost all data has been transferred to the Process Information (PI) database using tags.

10.5 Metallurgical Testing

Metallurgical testing, processes and procedures are used to evaluate drilling data at the current active mines and the South Pasture, Pioneer and DeSoto Properties. As drilling continues at all properties, the metallurgical testing, processes and procedures outlined in Section 10 also continue. Metallurgical testing is an on-going activity associated with all completed drilling.

10.6 Recovery Estimates

The process recovery at the beneficiation plants is mainly dependant on the feed grade, production-water clarity, equipment health and reagent quality. The process recoveries are calculated using the shift samples that are collected by the automatic samplers from the feed, concentrate and tails. Production engineers will conduct reagent quality checks on a monthly schedule.

Historical process recovery and product quality at South Fort Meade, Four Corners and Wingate are listed in the Table 10-2, Table 10-3, and Table 10-4, respectively.

Table 10-2: South Fort Meade Mine Recovery and Product Quality

Year	Recovery %	P_2O_5%	Acid Insolubles %	MER %
2018	88.5	28.9	12.0	8.9
2019	88.1	28.2	13.7	9.6
2020	86.8	28.5	12.8	9.7
2021	83.9	27.0	14.1	11.8
2022 Sept YTD	79.5	25.0	14.0	19.2

Table 10-3: Four Corners Mine Recovery and Product Quality

Year	Recovery %	P_2O_5 %	Acid Insolubles %	MER %
2018	87.3	28.5	12.9	9.8
2019	88.9	28.7	12.6	9.86
2020	89.5	28.4	13.9	9.5
2021	89.0	28.4	13.4	9.4
2022 Sept YTD	84.2	28.1	13.6	9.4

Table 10-4: Wingate Mine Recovery and Product Quality

Year	Recovery %	P_2O_5 %	Acid Insolubles %	MER %
2018	88.4	28.1	12.0	9.2
2019	85.9	29.1	10.3	8.5
2020	85.6	28.4	11.4	9.1
2021	84.5	28.4	10.9	9.4
2022 Sept YTD	83.8	29.5	10.4	7.7

Recovery is calculated as follows: Recovery% = (Concentrate P_2O_5) / (Feed P_2O_5) × (Feed P_2O_5-Tailing P_2O_5) / (Concentrate P_2O_5-Tailing P_2O_5) ×100%.

10.7 Metallurgical Variability

The combination of drill core sampling and historically proven consistency of the P_2O_5 grade surrounding the facilities provides confidence to the metallurgical consistency. However, equipment health, production-water quality and reagent uality affect the flotation recovery. Figure 10-1, 10-2, 10-3 show the relationship between feed grade and plant recovery using plant performance data for each plant. It indicates that a higher feed grade will generate a higher flotation recovery if the other factors remain unchanged.

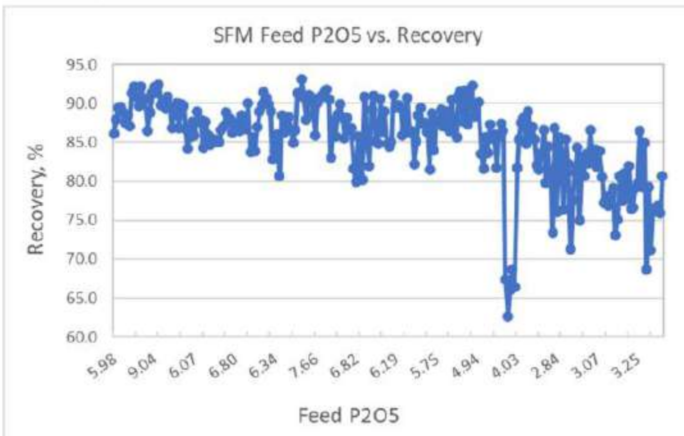
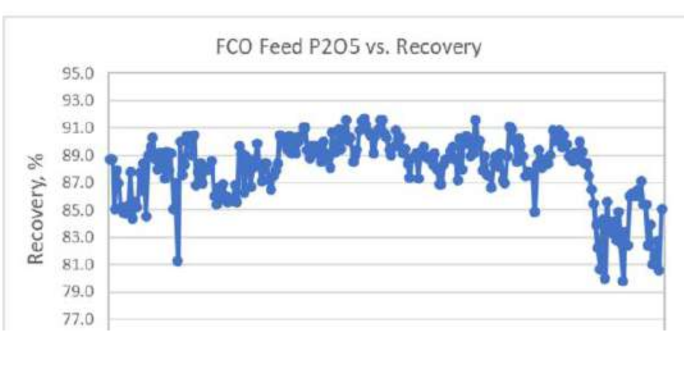


Figure 10-1: South Fort Meade Feed P_2O_5 Grade vs. Recovery%



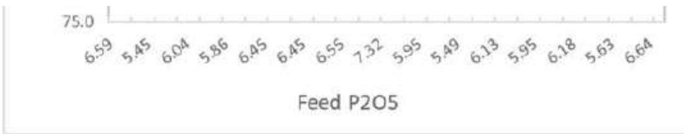


Figure 10-2: Four Corners Feed P_2O_5 Grade vs. Recovery%

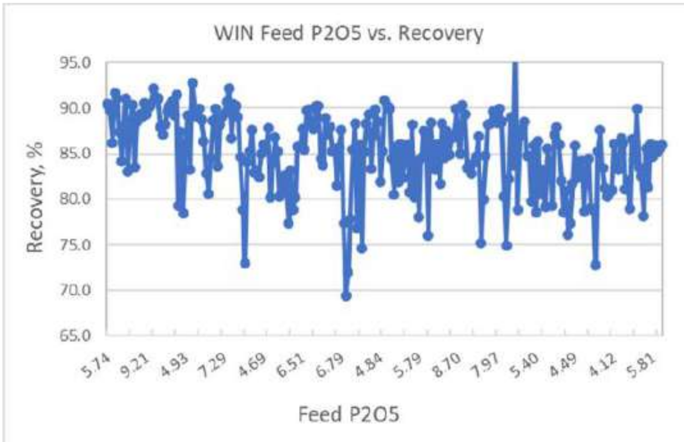


Figure 10-3: Wingate Feed P_2O_5 Grade vs. Recovery%

Figures 10-4, 10-5, 10-6 show the recovery control chart for the beneficiation plant for South Fort Meade, Four Corners and Wingate, respectively.

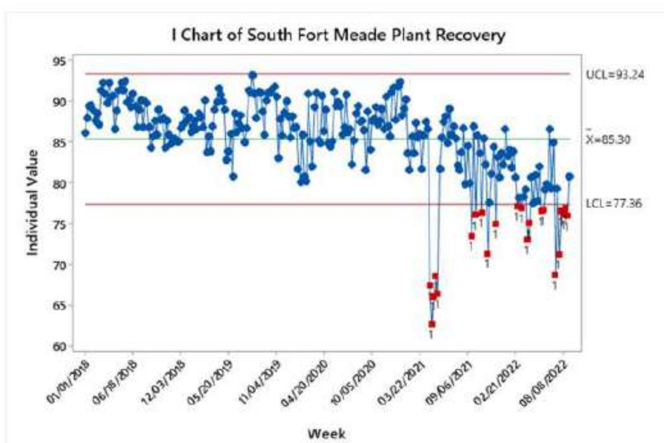
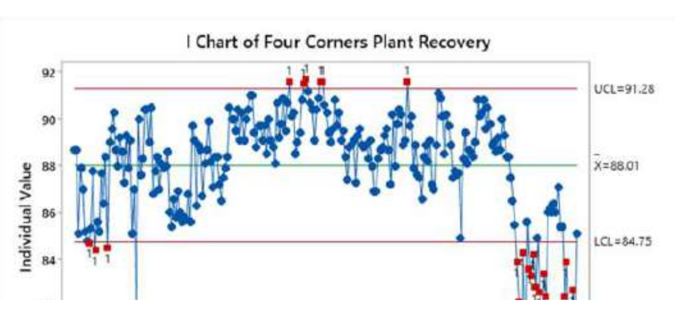


Figure 10-4: South Fort Meade Plant Recovery Control Chart



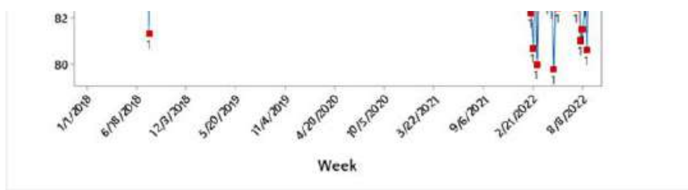


Figure 10-5: Four Corners Plant Recovery Control Chart

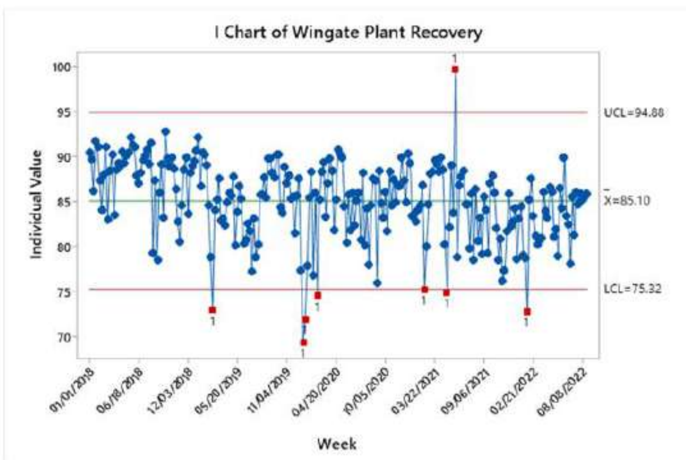


Figure 10-6: Wingate Plant Recovery Control Chart

10.8 Deleterious Elements

Phosphate mineralization in central Florida contains some deleterious elements for all mines that have been tested and verified by lab and plant tests. The major elements include magnesium oxide (MgO), pyrite (FeS_2) and aluminum oxide (Al_2O_3).

MgO

Sometimes the beneficiation plants process high MgO content feed. The high MgO content feed is mainly from dolomite, and the fatty acid can attach on dolomite and phosphate surfaces with calcium ions. If this happens, some high MgO content dolomite may go to the deoiling circuit which will affect deoiling and amine flotation recovery and final concentrate quality.

Pyrite

Pyrite is iron sulfide (FeS_2). Most of the matrix is above 65 ft., but occasionally draglines still mine some matrix below 65 ft.deep. There is a high chance that pyrite exists in the rock below a depth of 65 ft.

It has been verified that the pyrite is present in many of the lower matrix zones at southern Bone Valley, found as tiny inclusions in the phosphate crystal. If they are present on the surface, the fatty acid will adsorb on the pyrite very easily, causing more difficult deoiling. Normally, the deoiling pH must go below 2.0 to remove the fatty acid from the pyrite mineral, but too low deoiling pH (less than 2.8) will result in lower phosphate recovery, as it causes ortho-P (soluble phosphorus) to form. Ortho-P is a depressant for rougher flotation. The more ortho-P in the flotation production-water, the lower the phosphate recovery.

Al_2O_3

The clay minerals in the phosphate deposits of central Florida are a mixture of common (smectite, illite and kaolinite) and less common (palygorskite and sepiolite) minerals. There are almost always some clay chips in the flotation feed. The clay mineral can be a source of Al_2O_3 in the phosphate product. In addition, aluminum phosphate (wavellite or crandallite) is common in Four Corners matrix. As a result, Four Corners phosphate rock has a higher Al_2O_3 content than South Fort Meade and Wingate phosphate rock.

Other Deleterious Elements

Additional elements are noted in the mining and processing streams. These elements/compounds are in trace concentrations and have shown no notable accumulations within the process. These elements/compounds include calcium, aluminum and sulfate.

10.9 Qualified Person's Opinion on Data Adequacy

It is the opinion of the QP that the mineral processing, metallurgical testing and analytical procedures used and relied upon in this Report is adequate to support mineral resource and mineral reserve estimation for Florida phosphate mining. The rational for this is as follows:

- The analytical procedures used in the analysis are conventional and are aligned with industry practice.
- The data quality and quantity are aligned with industry standards.
- Collected samples are representative of the type and style of the mineralization and the mineral deposit as a whole.
- The verification and QA/QC processes validating the data is adequate.
- Test work programs, internal and external, continue to be performed to support current operations and potential improvements.
- The metallurgical test work completed is appropriate for optimizing processing conditions and routes for proper process operation.
- Tests are performed on samples that are considered to be representative of the mineralization styles and mineralogy.
- Beneficiation recovery factors estimated are based on appropriate metallurgical test work and confirmed with production data.
- The data received from the A-Lab is within industry standards to drive and support conclusions regarding the actual processes. See Section 8.1 for information regarding the A-Lab.

11.0 Mineral Resource Estimates

11.1 Introduction

Mosaic's phosphate mineral resources are reported as a beneficiation plant product (phosphate rock) tonnage and P_2O_5 grade including a total primary impurities ratio (MER). Mineral resources are reported exclusive of mineral reserves.

The geological information used to estimate the phosphate mineral resources for the mining facilities and exploration properties are based on drilling and sampling. The mineral resource estimates are completed using a proprietary software that applies specific grade, physical and impurity limits to the raw drill data of the property. These factors are used to select material that contains sufficient grade, limited impurities and is physically extractable to be included in the mineral resource estimate. The confidence and classification of the mineral resources is estimated based on the drill density of the evaluated area.

11.2 Key Assumptions

The following outlines the key assumptions used for the estimation of mineral resources.

- 100% of the estimated mineral resource (planned matrix) volume will be extracted.
- The minimum beneficiation plant concentrate BPL (%P_2O_5) and minimum pebble BPL (%P_2O_5) mineral resource cut-offs used for each site are listed in Table 11-1.

Table 11-1: BPL in Concentrate and Pebble Cut-Offs

Location	Minimum Concentrate BPL (%P_2O_5)	Minimum Pebble BPL (%P_2O_5)
Four Corners	60 (27.5%)	40 (18.3%)
South Fort Meade	60 (27.5%)	40 (18.3%)
Wingate	60 (27.5%)	40 (18.3%)
South Pasture	60 (27.5%)	40 (18.3%)
DeSoto	60 (27.5%)	50 (22.9%)
Pioneer	60 (27.5%)	50 (22.9%)

- Mineral resources are also defined by a maximum clay content cut-off for a logged matrix layer and the composite matrix volume (Table 11-2). South Pasture is expressed as a range to account for mineralogical variability.

Table 11-2: Clay Percent Cut-Offs

Location	Clay % Volume Limit (Split/Hole)
Four Corners	50/45
South Fort Meade	50/45
Wingate	40/40
South Pasture	40/40 to 50/50
DeSoto	40/40
Pioneer	40/40

- There is no dilution applied to the mineral resource estimates.

- Mineral resource limits are based on:
  - Setbacks from culturally sensitive, economically protected areas, municipal centers, adjacent property boundaries and structures as set by federal, state, county and local laws. The maximum set back is 1,320 ft. (402.3 m) from municipal centers. The minimum setback is 50 ft. (15.2 m).
  - Disturbance limits in issued federal, state and county permits.
- The mineral resource quality allows for unadjusted maximum pebble magnesium oxide (MgO) volume cut-off of 2.5%. Impurity levels are adjusted based on historical measurements.
- 100% of the estimated primary impurities (Fe_2O_3, Al_2O_3, MgO, and CaO) are recovered by mining.
- Maximum mining depth of 85 ft. (26 m) below ground surface for facilities that utilize draglines.
- Maximum mining depth of 109 ft. (33 m) below ground surface for facilities that utilize dredges.
- Beneficiation plant recovery assumptions:
  - 100% of the feed volume will be recovered
  - 100% of the pebble volume will be recovered
  - 100% of the concentrate will be recovered from the feed
  - 100% of the clay volume will be removed with no product included

11.3 Estimation Methodology

The methodology for estimating mineral resources is described as follows:

- Drill hole data is evaluated using a propriety software that applies mine specific mineral resource assumptions to each logged layer.
- Each logged layer within a hole that meets the mine specific requirements is composited into a "matrix" zone using product volumes as the weighting agent.
- Any analyzed logged layer that fails to meet the requirements and lies above all other passing logged layers or in-between passing logged layers is composited with the waste volume.
- Logged layers that underlie the entire passing volume are not included in the composite data.

- The composite data is exported as a text file to be used to determine the shape of the resource area in a GIS software and in the creation grids for the geologic model in a mining software.
- The composite data is then added to an GIS map and the mineral resource shape is drawn using the inverse distance weighted interpolation function based on where acceptable matrix is present in the drill data.
- A contour of the mineral resource shape is created and loaded into the mining software.
- The contour is then trimmed to account for permit and mine boundary limitations.
- The composite data text file and is then loaded into mining software to create a geological model.
- Areas that do not allow sufficient space for typical mining operation to take place with the production equipment in service at that mine are not considered for mineral resources.
- The drill data is also used to determine the shape of the mineral resource area for each confidence classification by further modifying the mineral resource contour within the accepted limits of mining.
- The interpolation method used in the geologic model to create the volume, density, grade and impurity grids is inverse distance weighted based on the geo-located drill data.

- Elevation grids are created using triangulation based on the LiDAR or survey data assigned to each drill hole.
- A utility macro is used to adjust elevations to account for holes with no matrix that meets the mine requirements.
- The data from each grid is then volumetrically combined using product volumes for the specific mineral resource shape and mineral resource classification creating a block of uniform constituents.
- Estimation of mineralization tonnage, grade and impurities is done by applying the volume weight percent of pebble, feed and clay for the given mineral resource shape to the entire volume of the acceptable matrix within that mineral resource shape.

11.4 Exploratory Data Analysis

The process for data analysis prior to mineral resource estimation is:

- Sampled historical drill hole data is reviewed for selection accuracy and adjustments are based on the prescribed limits of the area of the remaining mineral resource.
- As new drill data is added each hole is individually examined using operation specific mineral resource assumptions.
- Annually, mineral resource limits are reviewed for possible changes to reflect in proposed mining and sequences. If changes are made to limits, drill data is updated with the new limits and re-evaluated.
- Data that is not considered in the mineral resource estimation process includes data that cannot be geolocated, data that has missing densities, and data that has come from unverified sources through acquisition or other means. These are checked to ensure they have not been used in the current estimation process.

11.5 Validation

The validations of the mineral resource estimates are:

- Independent volumetric estimations are completed in parallel to the model estimates.
- Comparison iterations using known changes to confirm model results are completed.

11.6 Confidence Classification of Mineral Resource Estimates

Mineral resource classifications are defined in SEC Regulation S-K, Subpart 1300. Mosaic adheres to these definitions when assigning confidence and classification to their mineral resource estimates. The SEC Regulation S-K, Subpart 1300 definitions of measure, indicated and inferred mineral resources are as follows:

Measured Mineral Resource

A measured mineral resource is that part of a mineral resource for which quantity and grade or quality are estimated on the basis of conclusive geological evidence and sampling. The level of geological certainty associated with a measured mineral resource is sufficient to allow a qualified person to apply modifying factors, as defined in this section, in sufficient detail to support detailed mine planning and final evaluation of the economic viability of the deposit. Because a measured mineral resource has a higher level of confidence than the level of confidence of either an indicated mineral resource or an inferred mineral resource, a measured mineral resource may be converted to a proven mineral reserve or to a probable mineral reserve.

At all sites, a measured mineral resource is defined as mineralization delineated with at least a drill density of one hole per two and a half acres or greater.

Indicated Mineral Resource

An indicated mineral resource is that part of a mineral resource for which quantity and grade or quality are estimated on the basis of adequate geological evidence and sampling. The level of geological certainty associated with an indicated mineral resource is sufficient to allow a qualified person to apply modifying factors in sufficient detail to support mine planning and evaluation of the economic viability of the deposit. Because an indicated mineral resource has a lower level of confidence than the level of confidence of a measured mineral resource, an indicated mineral resource may only be converted to a probable mineral reserve.

At all sites, an indicated mineral resource is defined as mineralization delineated with a drill density of at least two holes per forty acres.

Inferred Mineral Resource

An inferred mineral resource is that part of a mineral resource for which quantity and grade or quality are estimated on the basis of limited geological evidence and sampling. The level of geological uncertainty associated with an inferred mineral resource is too high to apply relevant technical and economic factors likely to influence the prospects of economic extraction in a manner useful for evaluation of economic viability. An inferred mineral resource has the lowest level of geological confidence of all mineral resources. This prevents the application of the modifying factors in a manner useful for evaluation of economic viability, and an inferred mineral resource may not be considered when assessing the economic viability of a mining project and may not be converted to a mineral reserve.

For all sites, an inferred mineral resource is defined as mineralization delineated using a drill density of less than two holes per 40 acres.

11.7 Reasonable Prospects of Economic Extraction

Regulation S-K, Subpart 1300 requires that an evaluation be conducted as to the prospect of eventual economic extraction for mineral resources.

The Florida phosphate mineral resources are reported exclusive of the mineral reserves.

The parameters and assumptions listed in Section 11.2 are used to estimate the mineral resources for all sites.

The additional parameters and assumptions used to assess reasonable prospects for economic extraction of the measured and indicated mineral resources at DeSoto, Pioneer and South Pasture exploration properties are listed below. Unlike mineral reserves, mineral resources do not have demonstrated economic viability, but they do demonstrate reasonable prospects for economic extraction.

The SEC does not require an assessment of reasonable prospects for economic extraction for the inferred mineral resources at the DeSoto, Pioneer and South Pasture properties.

General Assumptions

- Deleterious elements have a minor impact on recovery of the mineral resources.
- There are no environmental, geotechnical and hydrogeological factors and concerns that will impact the prospects for economic extraction of the mineral resources.
- Each site will develop its own pumping, water and clay storage strategies.
- Reclamation plans are expected to be designed and approved by appropriate federal, state and local agencies prior to any mining at the exploration properties.
- The mining and surface rights are in place for the areas of mineral resource.
- The mineral reserve cut-off based on productivity factors per site have been applied to assess the prospects for economic extraction of the mineral resources. These are listed in Table 11-3.

Table 11-3: Productivity Cut-off Factors

Location	Recoverable Phosphate Rock tons vs. Matrix Volume Mined	Recoverable Phosphate Rock tons vs. Total Volume Mined
DeSoto	>7.5%	>2.2%
Pioneer	>7.8%	>2.2%
South Pasture	>7.8%	>2.2%

- The beneficiation plant assumed recoveries are listed in Table 11-4.

Table 11-4: Beneficiation Plant Recoveries

Recovered

Location	Recovered Sand Feed Volume %	Recovered Pebble Volume %	Recovered Intermediate Pebble Volume	Concentrate Grade Recovered from the Feed	Feed Grade Recovered	Concentrate BPL tons Volume from the Feed
DeSoto	100.0%	89.0%	n/a	85.0%	80.0%	68.0%
Pioneer	100.0%	89.0%	n/a	85.0%	80.0%	68.0%
South Pasture	87.0%	67.5%	280.0%	87.0%	83.0%	62.8%

- Mining dilution (Table 11-5) grading 0% P_2O_5 is applied to estimate mineral reserves.

Table 11-5: Mining Dilution

Location	Minimum Pebble Volume Dilution	Minimum Intermediate Pebble Volume Dilution	Minimum Concentrate Volume Dilution
DeSoto	12.0%	n/a	6.0%
Pioneer	12.0%	n/a	6.0%
South Pasture	12.0%	n/a	4.5%

- Primary impurity recoveries in pebbles, intermediate pebbles and concentrate based on a three-year rolling average are listed in tables 11-6, 11-7 and 11-8 respectively.

Table 11-6: Impurity Recoveries in Pebbles

Location	Fe_2O_3	Al_2O_3	CaO	MgO
DeSoto	100%	100%	100%	100%
Pioneer	100%	100%	100%	100%
South Pasture	96%	103%	99%	140%

Table 11-7: Impurity Recoveries in Intermediate Pebbles

Location	Fe_2O_3	Al_2O_3	CaO	MgO
South Pasture	96%	83%	98%	74%

Table 11-8: Impurity Recoveries in Concentrate

Location	Fe_2O_3	Al_2O_3	CaO	MgO
DeSoto	100%	100%	100%	100%
Pioneer	100%	100%	100%	100%
South Pasture	98%	104%	102%	92%

DeSoto Property Assumptions

- The mineral resources are amenable to dragline mining.
- An expected annual average production rate of 6.0 M tons/year (5.4 M tonnes/year) based on 365 production days per year.
- It is anticipated that the three current draglines in use at South Fort Meade will be moved to DeSoto and an additional dragline will be made available from Four Corners.
- The potable and production-water supplies and associated infrastructure are expected to be developed for the DeSoto property.
- DeSoto is expected to be a standalone site requiring its own new infrastructure and beneficiation plant.
- Rail and road access will be permitted and built.
- Water, matrix slurry and clay pumping assets are expected to be acquired and sized to accommodate the planned production rate.
- A "washer" of sufficient capacity is expected to be built to separate the oversized waste material and pebble product from finer size material.
- A "sizer" of sufficient capacity is expected to be built to separate the coarser sand size material from the finer sand size material.
- A section of the beneficiation plant flotation circuit is expected to be built to separate the finer sand size material from the fine waste material.
- There are no water management structures or production-water assets presently onsite. These are expected to be developed in the future.
- DeSoto expects to develop a power and electricity strategy.

Pioneer Property Assumptions

Pioneer Property Assumptions

- The mineral resources are amenable to dragline mining.
- An expected production rate of 3.5 M tons/year (3.2 M tonnes/year) based on 365 production days per year.
- Beneficiation is assumed to be through the South Pasture beneficiation plant. The Pioneer Property is expected to begin production as the South Pasture Property is exhausted.
- Pioneer is expected to share and supplement water and clay storage requirements with South Pasture.
- There are no water management structures or production-water assets presently onsite. These are expected to be developed in the future.
- The potable and production-water supplies and associated infrastructure are expected to be developed for the Pioneer property.
- There are no beneficiation activities planned in this area as they are expected to be shared with South Pasture. South Pasture beneficiation facilities are expected to continue to use Duke Energy and Mosaic cogenerated power.
- Mosaic is expected to develop a power and electricity strategy.

South Pasture Property Assumptions

- The mineral resources remain amenable to dragline mining.
- An expected average annual production rate of 3.5 M tons/year (3.2 M tonnes/year) based on 365 production days per year.
- The idled active beneficiation plant is expected to be restarted to process this mineralization.
- It is likely that the Duke Energy and the Mosaic cogeneration line from the New Wales and South Pierce chemical plants will resume supplying power to the site.
- South Pasture currently has two active clay settling areas that are permitted for clay storage, with approximately 33.7 M cubic yards of clay storage available. There are a number of other areas that will be considered for future construction.
- There are two operating public water wells for office areas and personnel. It is expected that these will be maintained and utilized.
- South Pasture Mine currently has some of the required infrastructure in place to support mining and processing. The office complex and associated maintenance areas are expected be used once the mine restarts production. Additionally, a portion of the beneficiation plant equipment is expected to be usable.
- The current water management structures are permitted to release water at a regulated quality and quantity from its two permitted in-service outfalls. This is expected to continue and be sufficient for the site.

Individual economic assessments have been completed for DeSoto, Pioneer and South Pasture. The positive after-tax NPV and total cash flow results of the assessments support reasonable prospects of economic extraction for the three exploration properties and the mineral resource estimates.

11.8 Mineral Resource Statement

The mineral resource estimates for the Florida phosphate exploration properties are listed in Table 11-9. Mineral resources are reported exclusive of the mineral reserves.

Figures 11-1, 11-2 and 11-3 show the distribution of the mineral resources at the DeSoto, Pioneer and South Pasture properties, respectively.

Table 11-9: 2022 Mineral Resources

Location	Measured Mineral Resources				Indicated Mineral Resources				Measured + Indicated Mineral Resources				Inferred Mineral Resources			
	Tons (M)	Tonnes (M)	% P_2O_5	MER	Tons (M)	Tonnes (M)	% P_2O_5	MER	Tons (M)	Tonnes (M)	% P_2O_5	MER	Tons (M)	Tonnes (M)	% P_2O_5	MER
DeSoto Property					156	142	30.5	10.7	156	142	30.5	10.7	67	61	30	10
Pioneer Property	19	17	31.1	9.3	136	123	30.4	10.4	154	140	30.5	10.3	21	19	30	10
South Pasture Property	94	85	29.7	10.4	165	150	29.4	10.9	259	235	29.5	10.7	4	3	30	10
Total	**113**	**102**	**30.0**	**10.2**	**457**	**415**	**30.1**	**10.7**	**569**	**517**	**30.0**	**10.6**	**92**	**83**	**30**	**10**

Notes to accompany mineral resource table:

1. Mineral resource estimates were prepared by QP Kevin Farmer, a Mosaic employee.
2. Mineral resources are reported as a beneficiation plant product (phosphate rock) tonnage and P_2O_5 grade including a total primary impurities ratio (MER).
3. Mineral resources have an effective date of December 31, 2022.
4. Mineral resources are reported exclusive of those mineral resources that have been converted to mineral reserves.
5. Mineral resources that are not mineral reserves do not have demonstrated economic viability.
6. Mineral resources are not mineral reserves and do not meet the threshold for mineral reserve modifying factors, such as estimated economic viability, that would allow for conversion to mineral reserves. There is no certainty that any part of the mineral resources estimated will be converted into mineral reserves.
7. Mineral resources assume dragline mining at all sites except Wingate Mine where dredging is assumed.
8. Mineral resources amenable to a dragline mining method are contained within a conceptual mine pit design using the same technical parameters as used for mineral reserves.
9. The cut-offs used to estimate mineral resources by site include, the minimum beneficiation plant concentrate BPL (%P_2O_5), minimum pebble BPL (%P_2O_5), maximum pebble magnesium oxide concentration and a maximum clay content cut-off for a logged matrix layer and the composite matrix volume (Section 11.2).
10. Impurities are reported as MER ((Fe + Al + Mg)/ P_2O_5 x 100).
11. Tonnage estimates are in US Customary and metric units and are rounded to the nearest million tonnes.
12. Rounding as required by reporting guidelines may result in apparent summation differences.
13. A commodity price of US$102.72/tonne of phosphate rock was used to assess prospects for economic extraction but is not used for cut-off purposes.

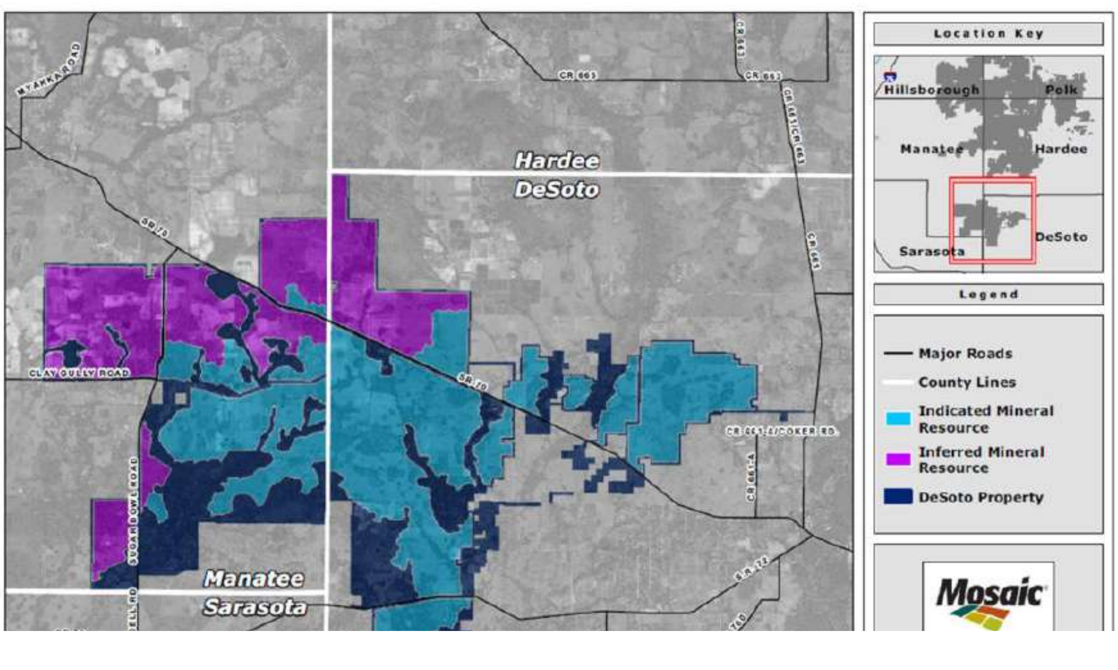


Figure 11-1: DeSoto Property Mineral Resources

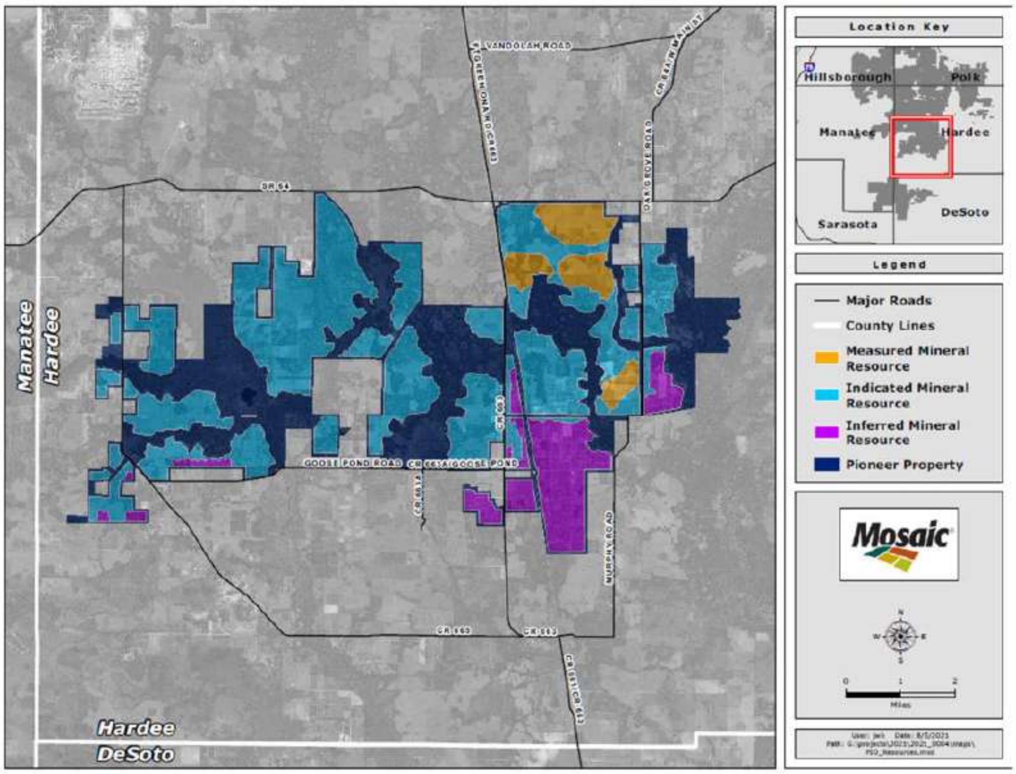


Figure 11-2: Pioneer Property Mineral Resources

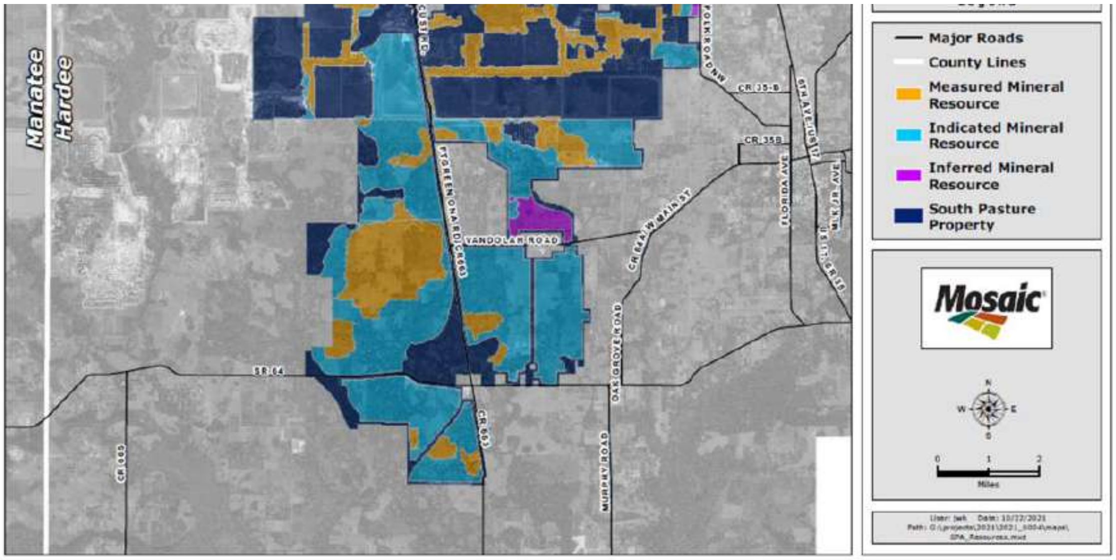


Figure 11-3: South Pasture Property Mineral Resources

11.9 Uncertainties (Factors) That May Affect the Mineral Resource Estimates

A mineral resource is an estimate only and not a precise and completely accurate calculation, being dependent on the interpretation of limited information on the location, shape and continuity of the occurrence and on the available sampling results. Actual mineralization can be more or less than estimated depending upon actual geological conditions.

The mineral resource statement includes inferred mineral resources. There is a low level of geological confidence associated with inferred mineral resources and there can be no certainty that further exploration work will result in the determination of indicated or measured mineral resources.

The following outlines a number of factors that impact the mineral resource estimates:

- Changing hole density as drilling continues.
- Unforeseen deposit changes such as continuity of matrix, impurities, etc. not captured in current drill data density and spacing.
- Drills holes can be offset from a designated pattern as a result of field conditions or access limitations. This could impact the pattern consistency for mine planning and mineral reserve pattern.
- The shape of the mineral resource boundary may change as additional properties are acquired and as additional data is added. Estimates will vary as drilling is added and as additional properties are acquired.
- Changes in finished products offered or developed could alter the limits and area that are used to estimate the mineral resource.
- The area included in the mineral resource estimation may change as permit restrictions are refined.
- If setback waivers are not acquired, the area of the mineral resource shape could change resulting in changed mineral resource limits and estimates.

12.0 Mineral Reserve Estimates

12.1 Introduction

Mosaic's mineral reserves are reported as a beneficiation plant product (phosphate rock) tonnage and P_2O_5 grade including a total primary impurities ratio (MER). Mineral reserves have demonstrated economic viability utilizing the criteria and assumptions required at each phosphate facility.

The geological information used to estimate the phosphate mineral reserves is based on applying specific product recoveries, concentration and plant limits to the raw drill data of mineral resource areas of the property. These factors are used to select material that contains sufficient product volume of economic value to be included in the mineral reserve estimate. The confidence and classification of the mineral reserves is estimate based on the drill density of the evaluated area.

12.2 Key Assumptions

The following outlines the key assumptions used for the estimation of mineral reserves.

- Cut-off based on productivity factors per site have been applied to estimate mineral reserves (Table 12-1).

Table 12-1: Productivity Cut-off Factors

Location	Recoverable Finished Product tons vs. Matrix Volume Mined	Recoverable Finished Product tons vs. Total Volume Mined
South Fort Meade	9.8%	2.2%
Four Corners	9.9%	2.2%
Wingate	9.4%	2.2%

- The beneficiation plant applied recoveries are based on an annual reconciliation process for a rolling three-year period (Table 12-2). Recoveries range from 67% to 131% and have been accounted for annually in the LOM plan.

Table 12-2: Beneficiation Plant Applied Recoveries

Location	Recovered Sand Feed Volume	Recovered Pebble Volume	Concentrate Grade Recovered from the Feed	Feed Grade Recovered	Recovered Concentrate BPL tons Volume from the Feed
South Fort Meade	131.0%	94.8%	78.4%	66.7%	68.5%
Four Corners	100.0%	97.2%	88.8%	78.9%	70.1%
Wingate	94.8%	87.8%	86.4%	97.1%	79.5%

- Mining dilution (Table 12-3) grading 0% P_2O_5 is applied to estimate mineral reserves.

Table 12-3: Mining Dilution

Location	Minimum Pebble Volume Dilution	Minimum Concentrate Volume Dilution
South Fort Meade	19.4%	12.6%
Four Corners	18.6%	11.1%
Wingate	13.5%	9.5%

- Primary impurity recoveries in pebbles and concentrate based on a three-year rolling average and are listed in tables 12-4 and 12-5 respectively.

Table 12-4: Impurity Recoveries in Pebbles

Location	Fe_2O_3	Al_2O_3	CaO	MgO
South Fort Meade	95%	104%	94%	150%
Four Corners	97%	115%	100%	123%
Wingate	88%	104%	100%	169%

Table 12-5: Impurity Recoveries in Concentrate

Location	Fe_2O_3	Al_2O_3	CaO	MgO
South Fort Meade	90%	104%	90%	100%
Four Corners	96%	104%	100%	82%
Wingate	87%	91%	100%	102%

12.3 Estimation Methodology

The methodology used to estimate mineral reserves is as follows:

- Drill hole data is evaluated using our proprietary software that applies mine specific mineral resource and mineral reserve limits to logged layers.
- Each logged layer within a hole that meets the mine specific requirements as detailed above, is composited into a "matrix" zone using product volumes as the weighting agent.
- Any analyzed logged layer that fails to meet the requirements and lies above all other passing logged layers, or in-between passing logged payers, is composited with the waste volume.
- Logged layers that underlie the entire passing volume are not included in the composite data.
- Drill holes not containing any matrix that meets the required mineral reserve assumptions will have the upper most matrix layer included in the compositing process to provide mineral reserve data where mine pits lie outside of the mineral resource shape.

- The composite data is exported as a text file and loaded into a mining software to create a geological model.
- The interpolation method used in the geologic model to create the volume, density, grade and impurity grids is inverse distance weighted based on the geo-located drill data.
- Elevation grids are created using triangulation based on the LiDAR or survey data assigned to each drill hole.
- A utility macro is used to apply plant volume recoveries, adjust insoluble limits and elevations grids. The pebble and concentrate insoluble sand are adjusted as per each mine's criterion (Table 12-3), resulting in a reduction in grade.
- Mineral reserves (mining areas) are overlaid on the mineral resource model by the mine planner.
- The data from each grid is then volumetrically combined using product volumes for the specific mine plan pit shape creating a block of uniform constituents. Tons, grades and product quality are estimated by applying the mining shapes to the geological model.
- The recoverable tons of pebble and feed for the entire mine pit are calculated based on the area of the mine pit.

- The beneficiation plant grade recoveries are then applied to the recoverable feed tons to estimate the mineral reserves and recoverable concentrate tons.

12.4 Mineral Reserve Statement

Mineral reserves are sub-divided into two confidence categories in Regulation S-K 1300, proven and probable. Table 12-6 outlines the 2021 mineral reserves for South Fort Meade, Four Corners and Wingate mining facilities. Figures 12-1, 12-2 and 12-3 show the distribution of the mineral reserves at the three Florida phosphate facilities.

Proven Mineral Reserves

A proven mineral reserve is the economically mineable part of a measured mineral resource and can only result from conversion of a measured mineral resource. Regulation S-K 1300 provides additional guidance that with regard to a proven mineral reserve, the qualified person must have a high degree of confidence in the results obtained from the application of the modifying factors and in the estimates of tonnage and grade or quality.

At the mines, a proven mineral reserve is defined as the mineable portion of a measured mineral resource.

Probable Mineral Reserves

A probable mineral reserve is the economically mineable part of an indicated and, in some cases, a measured mineral resource. Regulation S-K 1300 provides additional guidance that with regard to a probable mineral reserve, the qualified person's confidence in the results obtained from the application of the modifying factors and in the estimates of tonnage and grade or quality is lower than what is sufficient for a classification as a proven mineral reserve, but is still sufficient to demonstrate that, at the time of reporting, extraction of the mineral reserve is economically viable under reasonable investment and market assumptions. The lower level of confidence is due to higher geologic uncertainty when the qualified person converts an indicated mineral resource to a probable reserve or higher risk in the results of the application of modifying factors at the time when the qualified person converts a measured mineral resource to a probable mineral reserve.

At the producing mines, a probable mineral reserve is defined as the mineable portion of an indicated mineral resource.

Table 12-6: 2022 Mineral Reserves

Location	Proven Mineral Reserves				Probable Mineral Reserves				Total Mineral Reserves			
	Tons (M)	Tonnes (M)	$\%P_2O_5$	MER	Tons (M)	Tonnes (M)	$\% P_2O_5$	MER	Tons (M)	Tonnes (M)	$\% P_2O_5$	MER
South Fort Meade Facility	8	7	27.0	10.9	34	31	26.4	7.3	42	38	26.5	8.04
Four Corners Facility	41	37	28.1	10.0	34	30	27.6	10.7	74	67	27.9	10.3
Wingate Facility	13	11	28.3	8.6	9	8	27.8	10.2	22	20	28.1	9.3
Total	**61**	**56**	**28.0**	**9.8**	**77**	**70**	**27.1**	**9.4**	**138**	**126**	**27.5**	**9.6**

Notes to accompany mineral reserves table:

1. Mineral reserve estimates were prepared by QP Kevin Farmer, a Mosaic employee.
2. Mineral reserves have an effective date of December 31, 2022.
3. Mineral reserves are based on measured and indicated mineral resources only.
4. Mineral reserves are reported as a beneficiation plant product (phosphate rock) tonnage and P_2O_5 grade including a total primary impurities ratio (MER).
5. South Fort Meade and Four Corners mineral reserves are mined by a dragline mining method. The Wingate mineral reserves are mined by dredge mining.
6. Cut-off based on productivity factors per site have been applied to estimate mineral reserves (Section 12.2).
7. Impurities are reported as MER $((Fe + Al + Mg)/ P_2O_5 \times 100)$.
8. Mine designs are used to constrain mineral reserves within mineable pit shapes.
9. Only after a positive economic test and inclusion in the Life of Mine Plan are the mineral reserve estimates considered and disclosed as mineral reserves.
10. Tonnage estimates are in US Customary and metric units and are rounded to the nearest million tonnes.
11. Rounding as required by reporting guidelines may result in apparent summation differences.
12. A commodity price of US$68/tonne of phosphate rock was assumed to reach a rate of return equal to Mosaic's cost of capital

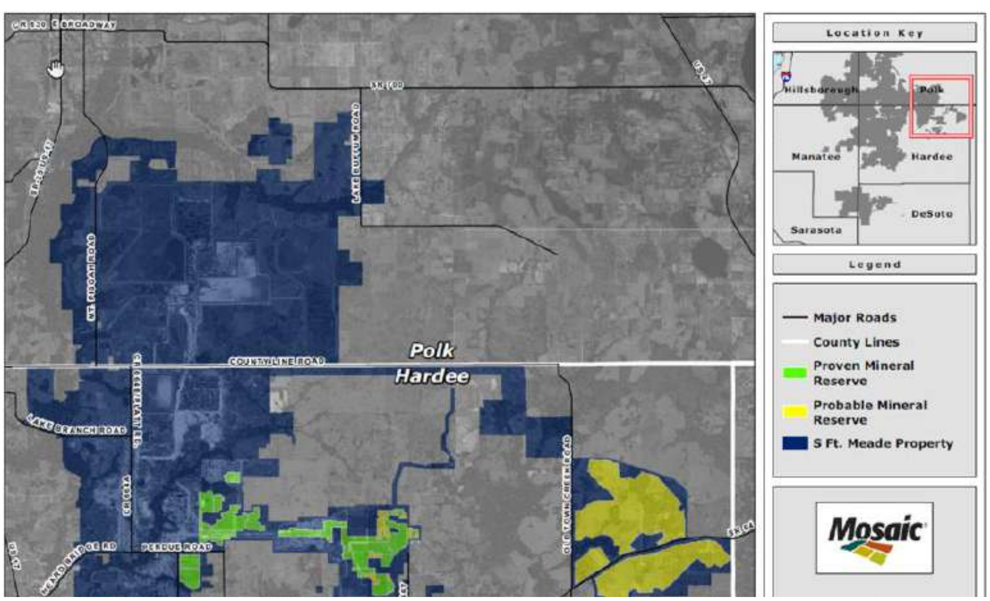


Figure 12-1: South Fort Meade Facility Mineral Reserves

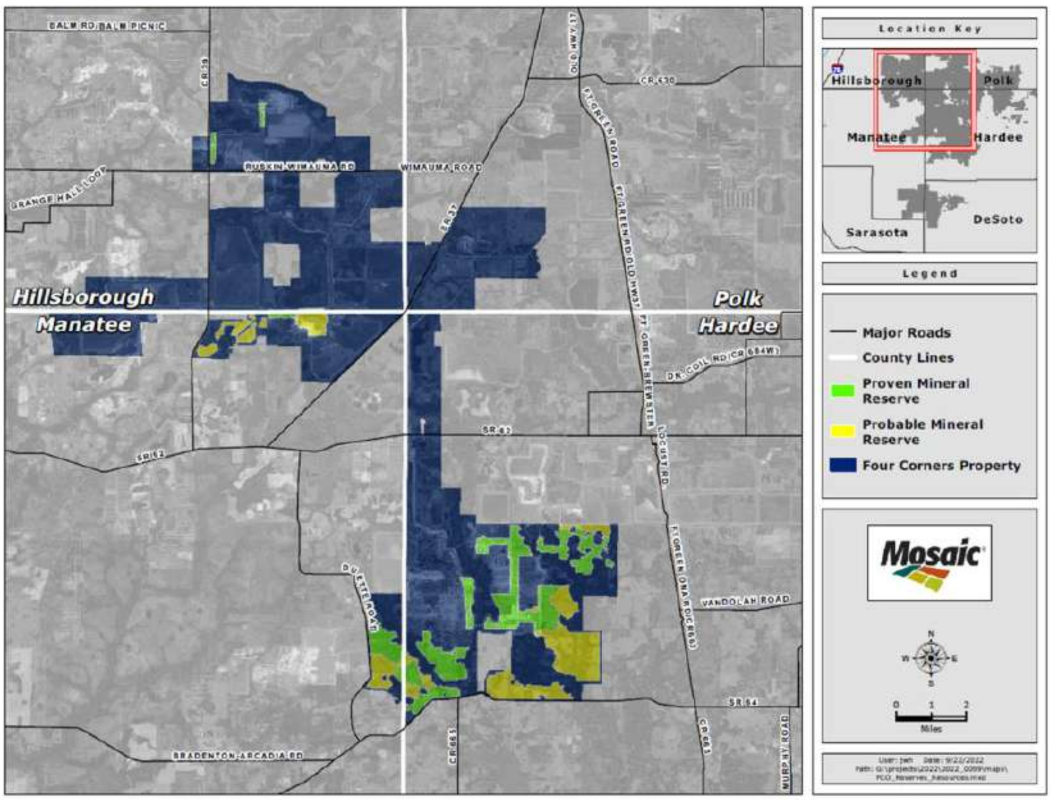


Figure 12-2: Four Corners Facility Mineral Reserves

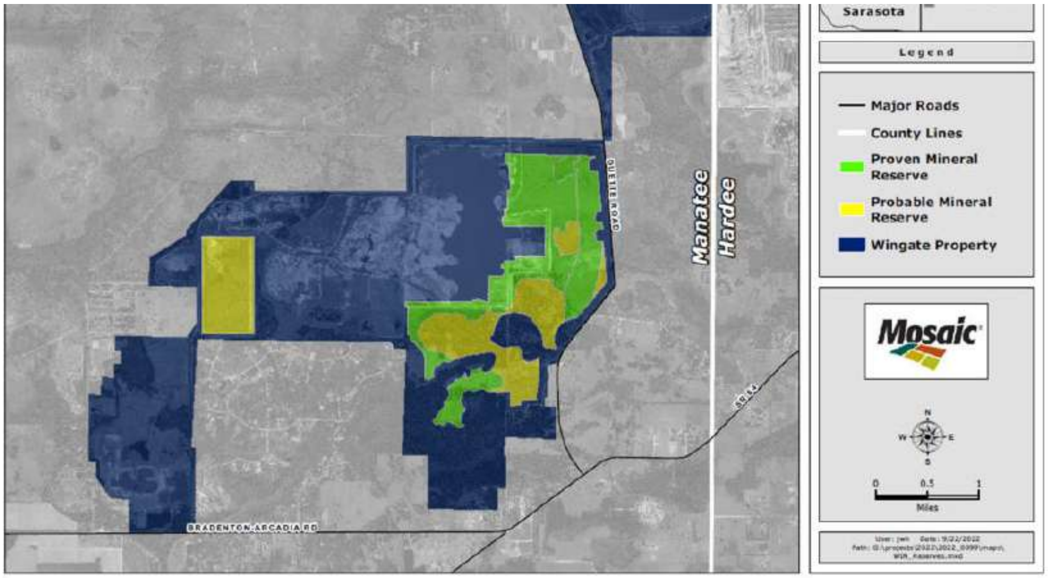


Figure 12-3: Wingate Facility Mineral Reserves

12.5 Uncertainties (Factors) That May Affect the Mineral Reserve Estimate

A mineral reserve is an estimate only. It is based on applying modifying factors to the mineral resources determined to be measured and indicated. Actual mineralization can be more or less than estimated depending upon actual geological conditions.

The following outlines a number of uncertainties that exist at the three producing phosphate mines that could impact the mineral reserve estimates:

- Actual geological thickness and grades are proven to be relatively uniform, but can vary locally.
- Changes in the level of the water table can impact the ability to mine the entire mineral reserve.
- The beneficiation plant recovery assumptions could change based on the three-year reconciliation process that is completed annually.
- Mine pit conditions can limit the recovery of the matrix volume and grade.
- As drilling continues tonnage, grade and impurity levels may change.
- There is variation in matrix volume and composition that may not be captured in the drilling data.

13.0 Mining Methods

13.1 Introduction

Phosphate is extracted using surface mining techniques. Mining utilizes either electric walking draglines or dredges to remove the overburden and mine the phosphate ore (matrix). The matrix is hydraulically transported to the beneficiation plant via a series of centrifugal pumping systems.

Pre-mining development follows the issuance of regulatory permits. This involves ditch and berms for stormwater control, groundwater draw down mitigation where applicable, land clearing, installation of infrastructure and pre-mining dewatering (only for dragline mining).

13.2 Mining Methods

13.2.1 Surface Dragline Mining

Mining started at Four Corners and South Fort Meade in 1981 and 1995, respectively. Since inception, both facilities have utilized draglines for mining.

Figure 13-1 outlines the dragline mining method process.

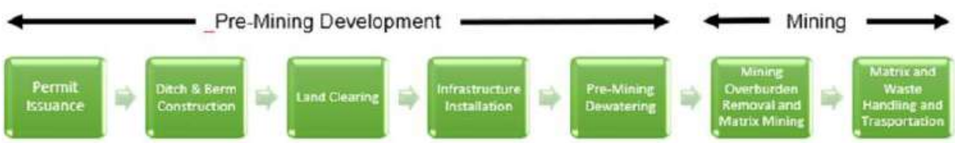


Figure 13-1: Dragline Mining Process

Pre-Mining

Upon issuance of regulatory permits (federal, state and local), development activities are initiated. An engineered Best Management Practice ditch and berm system (BMP) is constructed for the purpose of containing stormwater on the site. If necessary, it can also serve as groundwater drawdown mitigation off property or around preserved areas as a result of pre-mining dewatering and mining activities. Stormwater conveyance is installed and powered by electrical or diesel pumping systems. Dry cut conditions are desired during the mining process. Excess water in the cut can contribute to increased dilution, decreased reserve recovery and unstable ground conditions. In areas where the water table is high, pre-mining dewatering takes place with electric submersible pumps installed to the bottom of the deepest minable phosphate bearing layer. Based on water table and soil characteristics, these wells will run three to six months prior to dragline mining. During this time, the remaining infrastructure (hydraulic water supply and matrix pumping systems) are installed.

Mining – Overburden Removal

Draglines utilize a one-pass, modified simple side-cast method for overburden removal and mining of matrix (Figure 13-2). Overburden will be spoiled on top of the ground in an adjacent mined-out cut or pumped, depending on overburden/matrix thickness and available area. Geological considerations such as overburden/matrix thickness, spoil stacking characteristics and dragline reach are considered in cut design to ensure spoiled overburden does not encroach on uncovered matrix. Cut types are as follows:

- Box cuts are utilized in mining new areas. As an adjacent, previously mined cut is unavailable for spoil placement, overburden is placed at grade within the dragline dumping radius. When no space exists to spoil at grade, the overburden will be pumped to previously mined areas.
- Standard (modified simple side cast) cuts are utilized adjacent to previously mined areas. These cuts allow for the dragline to mine in one direction and place spoil into the void created from previous mining.
- Wiper cuts are similar to standard cuts in that the dragline can place spoil in adjacent previously mined cuts. However, wiper cuts are very short in length in that only one well per cut is required to receive the matrix from the dragline.

Figure 13-2: Dragline Operation

Mining – Matrix

Regardless of the cut type and spoil placement, matrix is mined in a consistent manner. An earthen well is formed with earthmoving equipment outside of the dragline cut but within the dragline dumping radius. After the dragline uncovers an advance of approximately 50 ft. (16 m), matrix is mined and placed in the well (Figure 13-3) where it is slurried with 10,000 US gpm of water at high pressure (250 to 300 psi). Once all matrix is mined, the dragline walks back and repeats the process. While the dragline generally advances in one direction the tub follows an arc within the cut as the dragline is dumping matrix to a fixed location. Once the dragline advances past the reach of the well, crews and equipment will move the well 300 ft. (91 m) parallel to the cut in the direction of advance such that the new location is within the dragline's reach. Depending on geology and rate of mining, this takes place every three to five days.

Figure 13-3: Dragline Dumping in Well

Matrix and Waste Handling and Transportation

Mined phosphate matrix is slurried and pumped to the beneficiation plant via a series centrifugal pumping systems. Upon dumping into the well, matrix is slurried by the addition of high-pressure water (250 to 300 psi) at around 10,000 US gpm. Water is delivered via a centrifugal pumping system in a 24 inch (61 cm) outside diameter steel pipeline. Matrix pumping systems are engineered to move 1,800 to 2,200 tons per hour in 20 to 22 inch (51 to 56 cm) outside diameter steel pipelines at a velocity of 15 to 17 ft./sec at the pit (13,000 to 15,000 US gpm). Centrifugal pumps ranging from 1,750 to 2,000 hp are spaced to match static head and friction resulting from flow and slurry characteristics. Slurry properties considered in design are concentration, solids density, shape and size distribution. Solid size distribution ranges from six inches to microns. The pumping systems are controlled by an operator with feedback on slurry flow, density, electrical pump demand and pipeline pressures.

General mill tailings (GMT), already slurried from the flotation process, are pumped back into previously mined cuts for reclamation purposes via a series centrifugal pumping systems in 20 to 24 inch (51 to 61 cm) outside diameter steel pipe. The same parameters used in matrix pumping design are applied to the tailings pumping system. Solid particles range from 16 mesh (1mm) to 150 mesh (0.1mm). The water is recovered and re-introduced to the recirculating water system for use by the plant or matrix pumping systems.

Clay from the washer is transported to clay settling areas (CSAs) via 36 inch (91 cm), 42 inch (107 cm) and 48 inch (122 cm) outside diameter HDPE pipelines. Each of these lines is fed by a single centrifugal pump. Nominal particle size is less the 150 mesh (0.1 mm).

13.2.2 Surface Dredge Mining

Since its startup in the 1980's, Wingate has utilized two electric dredges, one to remove overburden and the other to mine phosphate matrix. Both dredges are equipped with cutter heads and slurry pumping systems to liberate and transport material. Spuds are used to position the dredges and allow a point by which to pivot. Cables extending from the dredges to anchors on the port and starboard sides enable swinging across the cut. Upon each pass, the dredges advance further into the cut. Periodically, the dredges will retreat and perform a "clean up" pass for additional overburden or matrix recovery.

On average, the phosphate matrix is deeper at Wingate compared to the other mines. Dredge mining allows for extraction of the phosphate at greater depths with minimal impact on the surrounding water table. The two original Ellicott dredges were replaced in 2013 and 2014 by two comparable dredges from Dredge Supply Company (DSC).

Figure 13-4 outlines the dredge mining method process.

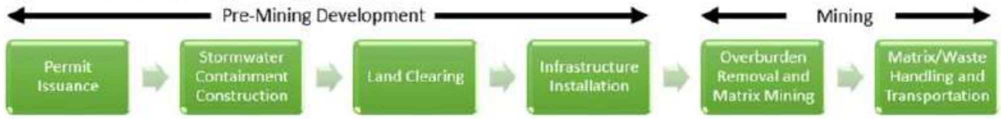


Figure 13-4: Dredge Mining Process

Pre-Mining

Wingate faces the same permitting process as dragline mines. Ditch and berm systems are built to provide stormwater containment onsite. As the presence of a high groundwater table does not affect the dredges, pre-mining dewatering is not utilized.

Mining – Overburden Removal and Waste Handling Transportation

Cut widths are dependent upon dredge geometry and overburden thickness. The water level of the dredge pond is nominally 15 ft. (4.6 m) below the ground surface. The overburden dredge (Figure 13-5) utilizes a centrifugal pumping system with 26 inch (66 cm) steel pipe to transport and discharge spoil into previously mined areas of the pond. As the cutter head feeds the suction underwater, the solids are diluted with an abundance of surrounding water. Slurry is transported at flows in excess of 20,000 US gpm. On occasion, dense, consolidated sand known as hardpan is encountered. As this material is tough to extract, contractors are used on an as-needed basis to remove and haul this material outside the immediate mining area. This is known as pre-stripping.

Figure 13-5: Overburden Dredge

Mining – Matrix and Transportation

As with the overburden dredge, the cut width of the matrix dredge (Figure 13-6) is based on dredge geometry and matrix depth. It also utilizes a centrifugal pumping system with 20-inch (51 cm) steel pipe to transport matrix to the beneficiation plant. Ease of material extraction and pumpability are generally determined by the clay content of the matrix. The pumping system is designed to the same specifications as the 20-inch (51 cm) systems used for dragline operations.

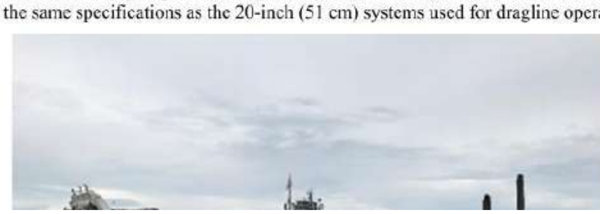


Figure 13-6: Matrix Dredge

13.2.3 Dragline and Dredge Mining Geotechnical Considerations

Ground conditions are considered not only for dragline stability while relocating or mining, but also outside the mining area as it relates to road and utilities rights of way (i.e., power lines, gas lines, etc.), preservation areas, non-Mosaic property and internal infrastructure (i.e., pipelines, powerlines, ditches, clay settling areas, mine roads, etc.). Ground conditions are considered during mine design when establishing appropriate setbacks from these features.

When a dragline completes mining of an area it is necessary to relocate the machine and related equipment. These are referred to as dragline relocations and require establishing dragline walk paths for safe movement of the mining equipment. Soil characteristics and water table are considered when determining walk path locations. Soil penetration tests (SPTs) are performed to characterize the soils ability to take load (Figure 13-7). Testing that identifies poor soils are re-evaluated and mitigated.

Dragline cuts are inspected frequently by the geologists. Highwall condition, water inflow and ground conditions are observed. These factors, in addition to overburden/matrix thickness and soil characteristics are considered when the geologist establishes appropriate digging slopes and dragline setbacks from the highwall.

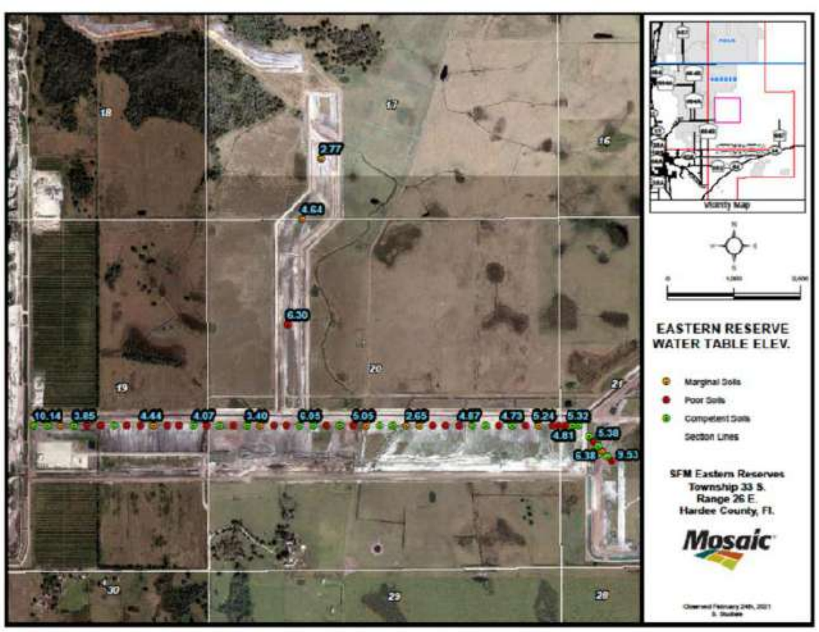


Figure 13-7: Dragline Walk Path Soil Penetration Testing and Piezometers

13.2.4 Hydrogeological Considerations

Groundwater levels can impact the relocation of draglines and the mining process.

Piezometers are installed to establish the water table elevation for dragline relocation walk paths. A minimum water table of 10 ft. (3 m) below the walk path grade is desired. This is achieved by a combination of ditching and dewatering wells (Figure 13-8). When dewatering techniques do not achieve the desired effect, earthen fill can be placed to raise the dragline walk path grade.

Water inflow into mine cut during mining contributes to increased dilution, decreased phosphate matrix recovery and potential unstable ground conditions. When needed, dewatering wells with submersible pumps are installed to the bottom of the deepest layer of matrix and operate for a period of three to six months prior to mining. Once a mine cut is established, the dragline digs a pit ditch below the bottom of the deepest mineable layer. The ditches convey water to a sump established by the dragline. A pump is placed in the sump and periodically repositioned as necessary. Cut water is discharged into previously mined cuts, clarified and re-introduced into the mine recirculating water system.

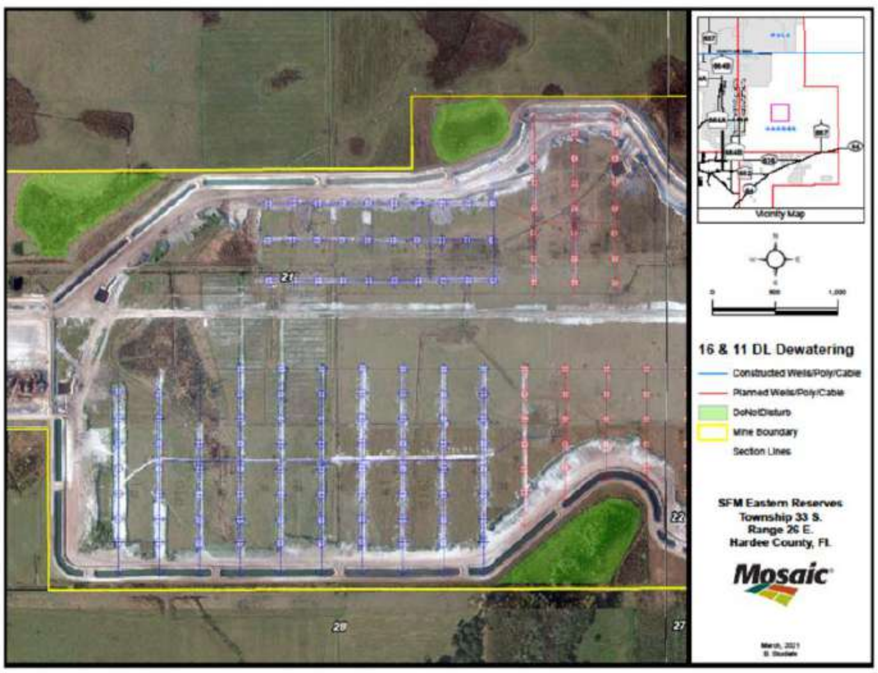


Figure 13-8: Pre-mining Dewatering

Due to the water level required for operation, dredge mining is less impactful to the hydrogeology than dragline mining. Groundwater drawdown mitigation is not needed due to the absence of pre-mining dewatering. The water level in the mining area is generally held within 10 to 15 ft. (3.0 to 4.6 m) from natural ground.

13.3 Mine Design and Operations

13.3.1 Production Plan/Life of Mine Plan

The LOM plan for South Fort Meade extends from 2023 to 2034, Four Corners from 2023 to 2033 and Wingate from 2023 to 2035 (Table 13-1).

Table 13-1: 2022 Life of Mine Plans

Year	Status	South Fort Meade Facility				Four Corners Facility				Wingate Facility			
		Tons	Tonnes	P_2O_5%	MER	Tons	Tonnes	P_2O_5%	MER	Tons	Tonnes	P_2O_5%	MER
2023	Plan	2,966,441	2,691,155	26.9	10.1	7,914,471	7,180,008	28.0	10.0	2,042,277	1,852,741	28.0	9.0
2024	Plan	3,164,575	2,870,903	26.6	12.3	7,559,818	6,858,267	27.4	10.6	2,297,812	2,084,561	28.0	8.5
2025	Plan	3,064,713	2,780,307	26.8	9.5	7,238,717	6,566,964	27.4	11.4	2,612,577	2,370,115	28.5	7.8
2026	Plan	3,369,484	3,056,795	25.0	7.2	7,036,268	6,383,303	27.2	11.1	2,127,960	1,930,472	28.5	7.7
2027	Plan	4,220,459	3,828,801	26.6	7.0	6,954,497	6,309,120	27.2	10.7	1,698,940	1,541,268	28.5	8.0
2028	Plan	4,850,348	4,400,236	26.7	6.7	7,402,907	6,715,918	27.0	10.2	1,387,231	1,258,487	28.7	8.1
2029	Plan	4,715,632	4,278,022	26.6	7.3	7,735,245	7,017,415	27.4	9.5	1,117,113	1,013,438	28.1	8.4
2030	Plan	4,326,417	3,924,925	26.7	7.2	6,755,794	6,128,856	28.0	9.5	1,465,690	1,329,666	28.0	9.6
2031	Plan	4,144,703	3,760,074	26.7	7.3	6,202,234	5,626,667	27.8	10.5	1,887,853	1,712,649	28.1	8.4
2032	Plan	3,574,952	3,243,197	26.6	7.2	6,555,654	5,947,290	28.4	9.7	1,249,403	1,133,451	28.2	8.6
2033	Plan	3,098,493	2,810,953	26.2	7.8	3,045,211	2,762,615	28.2	9.8	1,802,943	1,635,620	26.9	13.9
2034	Plan	512,948	465,347	25.8	7.3					1,669,901	1,514,924	27.0	13.9
2035	Plan									598,464	542,923	28.2	9.0
Total LOM		**42,009,165**	**38,110,715**	**26.5**	**8.0**	**74,400,817**	**67,496,422**	**27.9**	**10.3**	**21,958,164**	**19,920,316**	**28.1**	**9.3**

13.3.2 Planning Assumptions/Design Criteria

The following outlines the planning assumptions incorporated into the phosphate facilities 2022 Life of Mine (LOM) Plan:

- Legal and permit limitations eliminate areas of reserve based on federal, state and local laws and agreements.
- Mine pits are designed based on equipment limits and efficient mining practices.
- Mining areas are sequenced and scheduled based on various priorities including: waste disposal, reclamation requirements, permit limits, volume, grade and quality needs.
- No optimization is required as all areas determined to have recoverable matrix of sufficient finished product volume, grade and quality will be mined.
- Equipment production rates and availability.
- Mine pit limits are designed based on stability setbacks from impoundments, powerlines and other permanent infrastructure.
- Overburden is removed at a sufficient rate that the matrix mining dredge at the Wingate Facility will not be negatively impacted.
- Areas not currently permitted for mining will be available as sequenced in the LOM plan.

13.3.3 Mining Sequence

The mining sequences for South Fort Meade, Four Corners and Wingate facilities are presented in Figures 13-9, 13-10 and 13-11, respectively. The planned mining covers the extent of the current mineral reserves. The sequence was developed to maximize the equipment availability and production from the reserve acreage available at that time.

The mining sequence and planning for the producing facilities consider the following points:

- Timing required to build, place needed infrastructure and area preparation for mining to commence.
- The need to balance ton volume and quality.
- Time needed to receive permits for newly acquired property.
- Equipment relocations and access requirements.
- Permit limitations.
- Waste storage needs.
- Reclamation planning and timing.

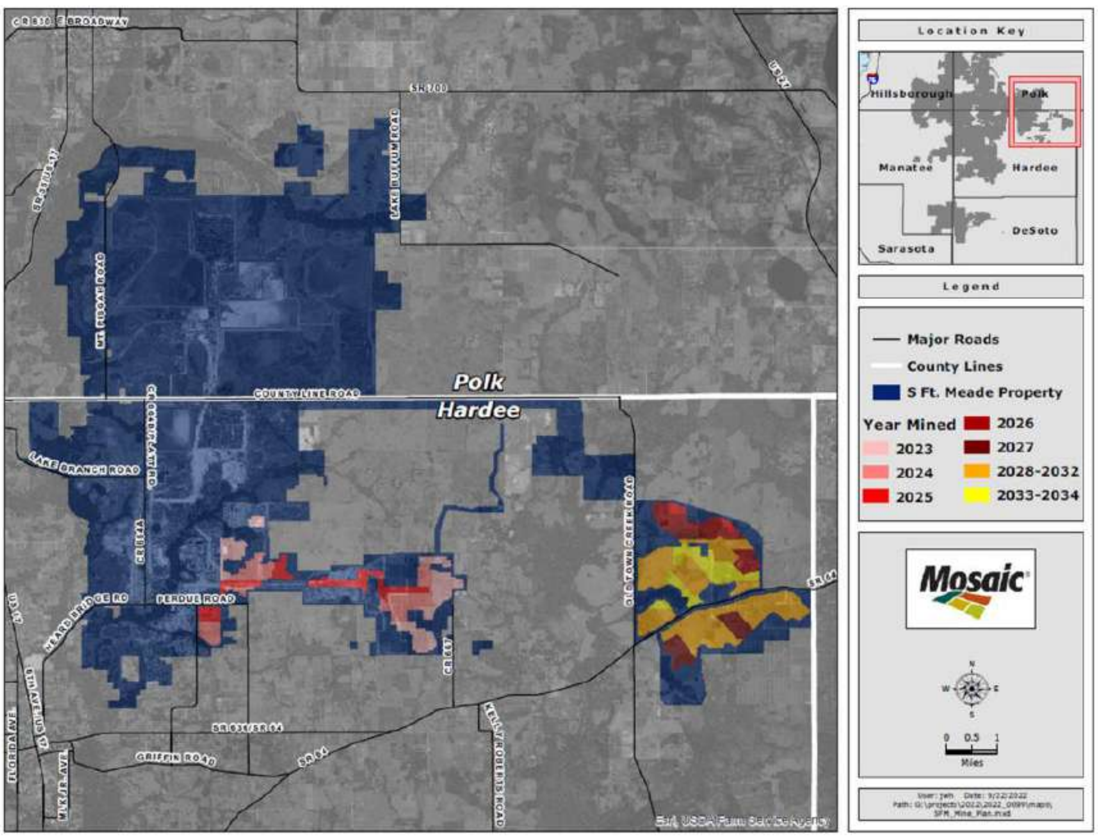


Figure 13-9: South Fort Meade Facility LOM Plan Sequence

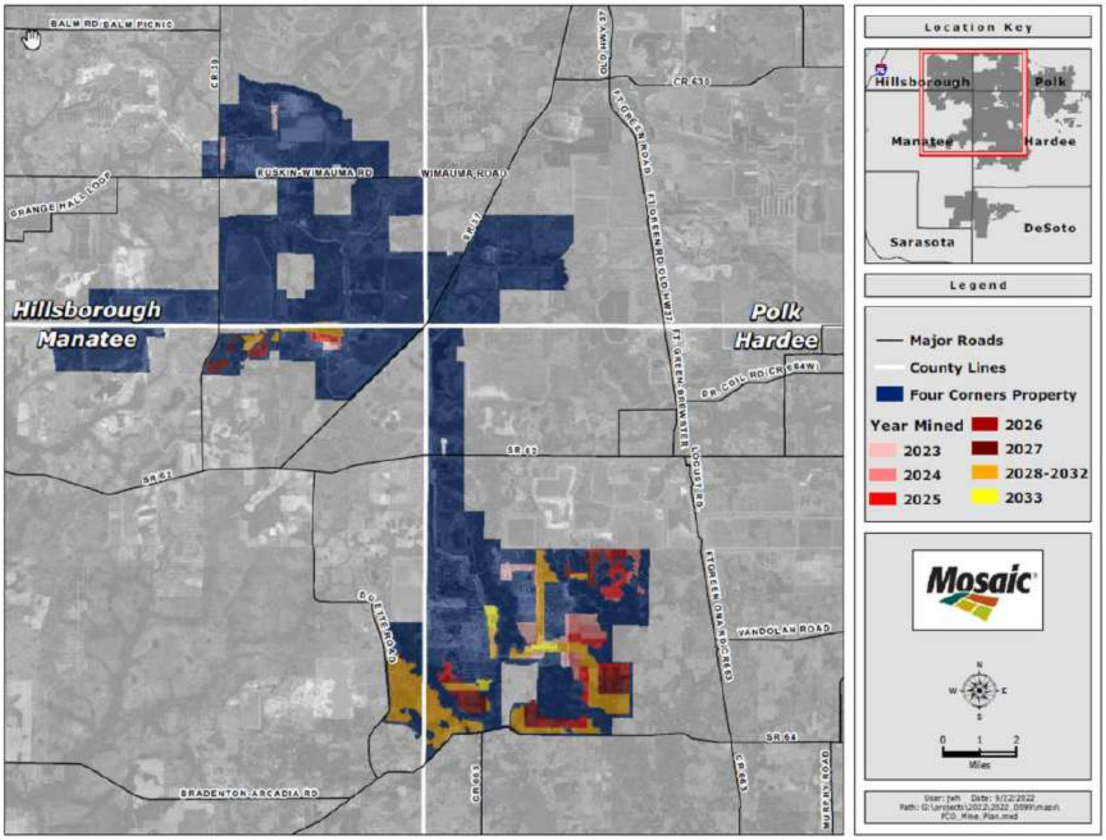


Figure 13-10: Four Corners Facility LOM Plan Sequence

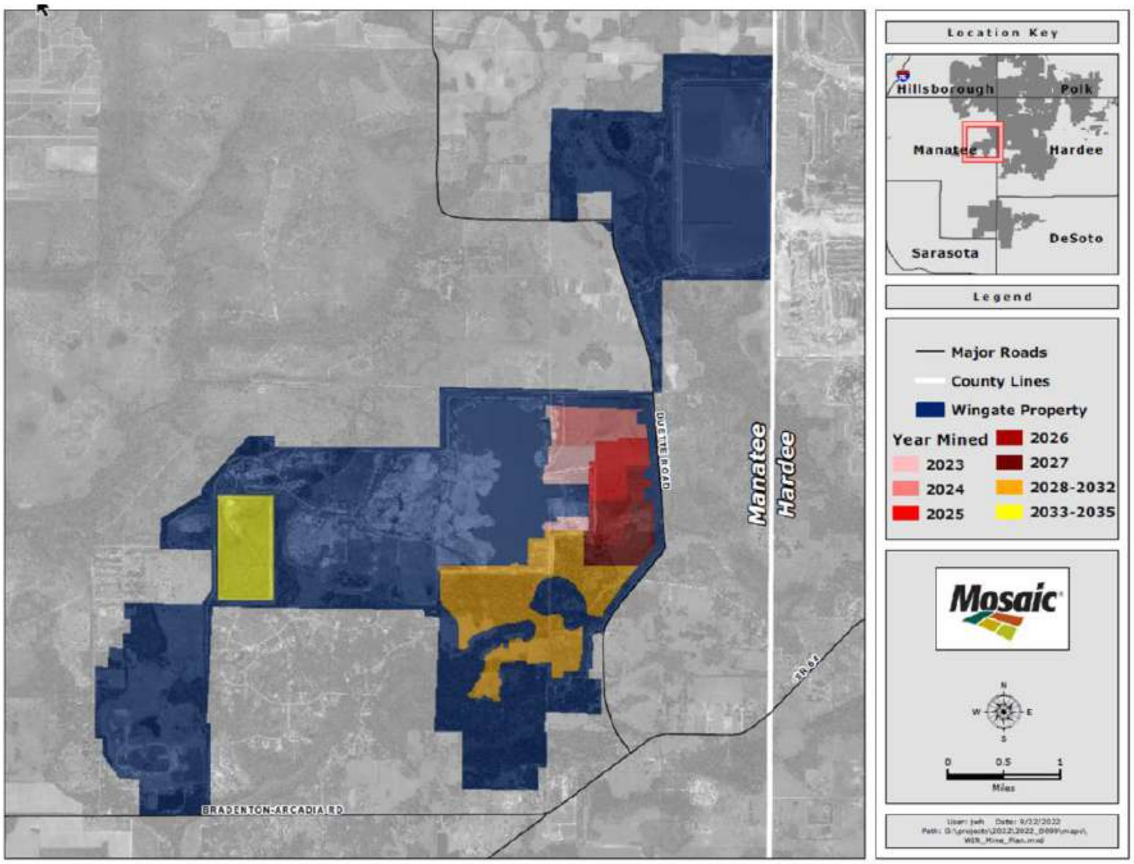


Figure 13-11: Wingate Facility LOM Plan Sequence

13.3.4 Mine Production Monitoring

Mine production is monitored in real time as follows:

<u>Draglines</u>

- A Dragline Monitoring System (DMS) is installed on each dragline that provides real time feedback on:
  - Bucket count of matrix and overburden
  - Cubic yards moved of matrix and overburden
  - Dragline operating and downtimes
  - Dragline cycle times
  - Dragline swing angles
- Video cameras are installed on each dragline and monitored at a central location.
- Mass-flow systems are installed on each matrix pumping system utilizing nuclear density gauges for density and magnetic flow meters for slurry flow. The combination produces real-time mass-flow (tons per hour) feedback.
- Matrix and hydraulic water pumping systems are equipped with pressure transducers and ammeters to monitor performance.

<u>Dredges</u>

- A dredge monitor is installed on each dredge that provides real time feedback on:
  - Cutter head depth (i.e., mining depth)
  - Hydraulic system pressures (i.e., cutter head, swings, etc.)
  - Suction vacuum

- Video cameras are installed on each dredge and monitored at a central location.
- Mass-flow systems are installed on each matrix pumping system utilizing nuclear density gauges for density and magnetic flow meters for slurry flow. The combination produces real-time mass-flow (tons per hour) feedback.
- Matrix and overburden pumping systems and equipped with pressure transducers and ammeters to monitor performance.

13.3.5 Equipment

Each mine controls the equipment necessary for overburden removal and phosphate matrix extraction. Table 13-2 outlines the amount of major mining equipment and their associated capacities and estimated useful life. Table 13-3 outlines the support equipment including any lease terms.

Table 13-2: Major Mining Equipment

Facility	Manufacturer / Model	Quantity	Bucket Capacity (cu yds)	Estimated Useful Life (Years)
South Fort Meade	Electric Walking Dragline	3	55	75
Four Corners	Electric Walking Dragline	1	65	75
Four Corners	Electric Walking Dragline	4	55	75
Four Corners	Electric Walking Dragline	2	42	75
Four Corners	Electric Walking Dragline	2	40 to 42	75
Four Corners	Electric Walking Dragline	1	45	50
Wingate	Electric Cutter Head Dredge – 26 inch	1	n/a	30
Wingate	Electric Cutter Head Dredge – 20 inch	1	n/a	30

Table 13-3: Primary Support Equipment

Type	Quantity	Lease Term (months)
Wheel Loader	21	60 to 64
Track Dozer	26	30 to 36
Motor Grader	4	60
Excavator	9	48 to 60
Crane	8	60 to 84

Draglines are scheduled for 12-hour repair days every four to six weeks. Major maintenance turnarounds are scheduled every five to seven years depending on the scope of major repairs to be completed. Major repairs include repair or replacement of mast/boom suspension cables, tub, rack/rails/rollers, drag/hoist/swing/propel drivetrains, motors, generators, etc.

Heavy mobile equipment used for supporting activities are leased for 30 to 84 month terms. Upon termination of the lease, equipment is replaced with like equipment.

13.3.6 Personnel

Table 13-4 outlines the current and forecasted mine personnel requirements. It excludes personnel who may report to a centralized support function. The sites utilize contractors on an as-needed basis.

The bulk of the Mosaic mining workforce is positioned as operational workforce including supervisory roles and support to the operational workforce.

Contractors used onsite must adhere to strict safety guidelines and registration within an online portal. This portal tracks contractor's safety performance and compliance to specific registrations, such as insurance coverage. Where contracted employees are in an embedded contractor relationship, supervision is provided by the contractor with an assigned liaison for oversight who is a Mosaic employee.

Table 13-4: Mining and Beneficiation Plant Personnel Requirements (Hourly and Salary)

Location	Area	2018 Actual	2019 Actual	2020 Actual	2021 Actual	2022 Feast.	2023 Plan	2024 Plan	2025 Plan	2026 Plan	2027 Plan	LOM Plan
Four Corners	Hourly Operations	244	267	256	249	249	249	249	249	249	249	249
South Fort Meade		127	127	123	128	128	128	128	128	128	128	128
Wingate		64	61	59	60	60	60	60	60	60	60	60
	Subtotal	**435**	**455**	**438**	**437**	**437**	**437**	**437**	**437**	**437**	**437**	**437**
Four Corners	Hourly Maintenance	141	145	141	123	123	123	123	123	123	123	123
South Fort Meade		39	44	45	44	44	44	44	44	44	44	44
Wingate		25	26	25	24	24	24	24	24	24	24	24
	Subtotal	**205**	**215**	**210**	**191**	**191**	**191**	**191**	**191**	**191**	**191**	**191**
Four Corners	Salary	104	100	84	70	70	70	70	70	70	70	70
South Fort Meade		50	49	45	39	39	39	39	39	39	39	39
Wingate		26	25	24	18	18	18	18	18	18	18	18
	Subtotal	**181**	**175**	**153**	**127**	**127**	**127**	**127**	**127**	**127**	**127**	**127**
Four Corners	Overall	489	512	481	442	442	442	442	442	442	442	442
South Fort Meade		215	220	213	211	211	211	211	211	211	211	211
Wingate		116	112	107	102	102	102	102	102	102	102	102
	Total	**820**	**844**	**801**	**755**	**755**	**755**	**755**	**755**	**755**	**755**	**755**

14.0 Recovery Methods

14.1 Introduction

After receiving matrix from the pits, the washers separate minerals from each other and generate four separate material groups. These are debris, pebbles, clay and unsized flotation feed.

The debris is mineralization rejected due to the high MgO content. The minimum size for the rejected debris is 5/16 inch, 3/4 inch, and one inch for Four Corners, South Fort Meade and Wingate, respectively. This difference is due to the mineralogy at the three facilities. Pebbles are one of the final products with a particle size ranging from 5/16 inch to 16 mesh, 3/4 inch to 16 mesh and one inch to 20 mesh for Four Corners, South Fort Meade, and Wingate, respectively. Material smaller than 150 mesh is pumped to the clay settling areas. The remaining material is unsized flotation feed and ranges in size from 16 to 150 mesh.

Sizing separates the unsized flotation feed into four parts: intermediate pebble (IP), ultra-coarse flotation feed (South Fort Meade only), coarse flotation feed and fine flotation feed. The IP (or sizer rock) is one of the final products and its size is in the range of 16 to 20 mesh. The ultra-coarse, coarse and fine flotation feed will be pumped to the flotation plant and the particle size is normally in the range of 20 to 24 mesh, 24 to 35 mesh, and 35 to 150 mesh, respectively.

Flotation separates phosphate and sand using reagents in a two-stage process. The final concentrate product is transported to stockpile via conveyors with the tailings pumped back for reclamation.

14.2 Beneficiation Process

When mined, the phosphate and sand particles are embedded in compacted mud, or "clay-balls." Before separation can begin, all the particles must be liberated from the matrix of mud. The very first unit operation in the beneficiation process is to disaggregate the various particles. This starts while the matrix is flowing through the pipeline from the mine to the beneficiation plant. While in the pipeline, the matrix is exposed to shear forces as it passes through the various centrifugal pumps. These intense shear forces cause a significant percentage of the sand and phosphate particles to be liberated from the clay-balls by the time they arrive at the beneficiation plant. Once reaching the plant, the first goal is to finish disaggregating the clay and make a size separation at 1 mm. This processing is conducted in the "washer." In all the currently operating beneficiation plants, the washer is a large structure that receives the matrix, screens it, then discharges a +1.0 mm "pebble" phosphate product and a -1.0 mm slurry of liberated clay, sand and phosphate particles. This first phosphate product (pebble) can be as little as 5%, and as large as 70% of the mine's total production depending on the nature of the matrix being mined.

The next process objective is to remove the clays that are finer than 0.1 mm. The beneficiation plant does this with hydro-cyclones. Slurry from the washer is fed tangentially into the cyclone (a conical chamber) at a high gravitational force. The slurry swirls around inside the cyclone until fine clays overflow the top of the chamber. Coarse sand and phosphate particles swirl to the bottom of the cyclone and exit. The fine clays are collected and pumped to large impoundments. The +0.1 mm sand and phosphate move on to the next process, sizing.

Sizing is done with equipment called "hydrosizers." Feed and upward flowing water are injected into large tanks that force the fine particles to rise and overflow the tank, while the coarse particles gently fall and flow out the sizer's underflow.

The phosphatic material that passes through the sizing process is then separated from the waste material by the flotation process that is used in mineral beneficiation plants around the world. Flotation was discovered early in the 20th century, and today it is the most used separation technology in the mining industry. Flotation separates valuable minerals (copper, lead, zinc, iron and phosphate) from the unwanted minerals in the ore (sand in this case). In the direct flotation process the valuable mineral is coated with a special hydrocarbon (fatty acid). Once the phosphate surfaces are coated, they repel water just like a freshly waxed car during a rainstorm. The slurry of waxed-phosphate and un-waxed sand is diluted and put in agitated tanks. Tiny air bubbles are injected into the tanks (called flotation cells) that attach to the waxed phosphate particles (the water-repelling particles are pushed out of the water into the bubbles). The air bubbles rise with the phosphate to the top of the flotation cell where the valuable froth is skimmed from the surface and collected. This unique chemical technology can make particles denser than water rise to the top and float on the surface of a slurry.

To upgrade the initial ("rougher") phosphate concentrate to a usable product, a second cleaning flotation process is used to remove the last of the residual sand. The original hydrocarbons are stripped from the phosphate surfaces, and then a different hydrocarbon is applied to the rougher concentrate. This second hydrocarbon is an amine-based reagent that coats sand, but not phosphate. Once again, the slurry is fed into flotation cells, agitated and exposed to tiny air bubbles. The air carries the remaining sand to the surface where it is skimmed off and discarded. The remaining phosphate mineral ("concentrate") is collected, blended with the pebble product and shipped via rail or truck to the chemical plant for the third step in making phosphate fertilizer.

The sand from the rougher and cleaner flotation process is collected and pumped back to the mine cuts for use in land reclamation.

14.3 Plant Design

The beneficiation plants are designed with primary production inputs from the draglines or dredge and with a smaller

The beneficiation plants are designed with primary production inputs from the draglines or dredge and with a smaller secondary input from recaptured circuits. All inputs enter the plant at the washer and flow through the sizing section to the flotation plant. There is a restricted recycle process that can relieve overflow from the sizing section by transferring volume to the flotation plant to keep the plant operational. Phosphate rock is transported to stockpiles via conveyors and waste is pumped to storage impoundments or back to the mine for reclamation.

14.4 Process Flowsheet

The simplified plant flowsheet is shown in Figure 14-1 and described below. This is a typical phosphate beneficiation plant flowsheet. The South Fort Meade plant has three step sizers (primary, secondary and tertiary), while the Four Corners and Wingate plants only have one step sizer.

The South Fort Meade beneficiation plant has an ultra-coarse flotation circuit, which is similar to the Four Corners IP circuit. Wingate does not have the IP product because it is recycled back to the washer trammel screen underflow tank. In addition, the cut size of debris varies from plant to plant due to rock minerology difference, that is 5/16 inch, 3/4 inch and one inch for Four Corners, South Fort Meade and Wingate, respectively.

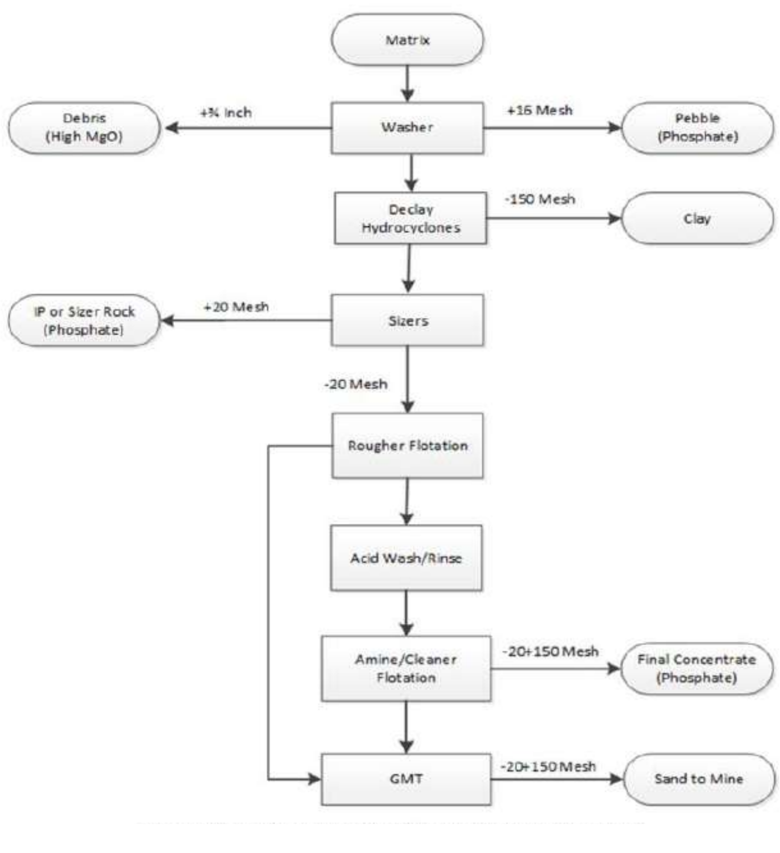


Figure 14-1: Phosphate Beneficiation Process Flowsheet

Washer Area

In general, the washer area receives matrix/ore feed from the mine, disaggregates the clays from pebble and screens the matrix into four size fractions: +3/4 inch as rejects, -3/4 inch to +16 mesh as pebble, -16 mesh to +150 mesh as raw feed (unsized flotation feed), and -150 mesh as waste clay.

The washer area consists of trommels, hammermills and hydroslicers. The trommels are used to separate oversize materials for size reduction, whereas the hammermills and hydroslicers are used to break down or disaggregate mudball materials containing feed and clays.

South Fort Meade washer has hydroslicers that were installed in 2000. Before the installation of hydroslicers, the washer used hammermills to break the mudballs. The hydroslicers use 600 to 700 psi pressure water to detach material trapped on the surface of the large mudballs. After the process of hammermills and hydroslicers, the coarse materials (>1 inch) are saved at a mudball pile.

The primary and secondary log washers are used to disintegrate clay-balls that contain phosphate material. Three stages of vibrating screening (intermediate screens, double deck screens, finishing screens) remove the remaining and newly disintegrated -16 mesh material from the pebble.

The design capacity of Four Corners washer is 8,000 tons/hour, 4,000 tons/hour at South Fort Meade and 2,200 tons/hour for Wingate. However, the maximum matrix rate is associated with the clay content. If the clay content increases, the matrix rate is decreased to reduce feed losses.

Declay Area

Material smaller than 16 mesh is pumped to primary declay cyclones for clay removal. Cyclones separate particles based on the mass of each individual particle. If all the particles are the same specific gravity, then effectively a size separation can be made. The clay, sand and phosphate minerals are all virtually the same specific gravity which allows the segregation of fine particles from coarse particles using cyclones.

As the cyclone feed clay content rises, there is a documented exponential increase in fluid viscosity. This results in worse sizing performance. Based on historical results, the clay content of the overflow should be lower than 4.5% solids to have optimal cyclone sizing performance. A typical 24-inch declay cyclone can be fed with up to 15.7 tons/hour clay by assuming the overflow discharge at ~1,350 US gpm. Four Corners and South Fort Meade have 48 primary declay cyclones, allowing the washer to process up to 751 tons/hour of clay and still have acceptable losses. Compared to Four Corners and South Fort Meade, the Wingate declay cyclone design is different, as it has 12 24-inch and 13 26-inch cyclones. The clay content changes from shift to shift, therefore the matrix feed rate to the plant should be adjusted accordingly. The relationship between the clay content of the matrix and the maximum feed rate to avoid excessive cyclone feed losses (for 48 cyclones) is presented in Figure 14-2.

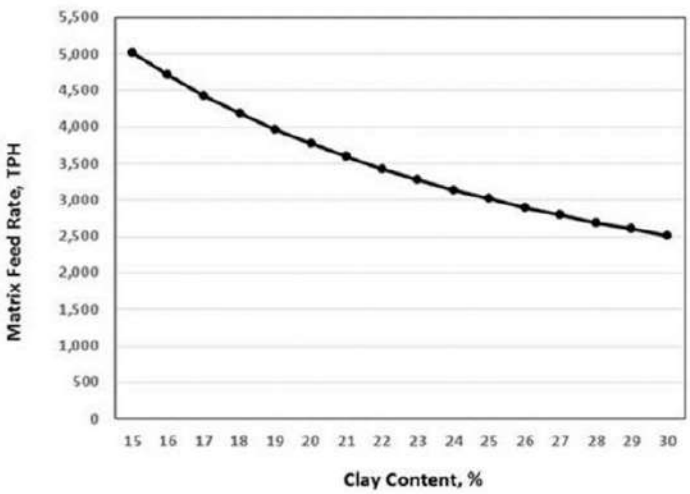


Figure 14-2: Matrix Clay Content vs. Maximum Feed

The declay cyclone systems can recover 99.5% of the +150 mesh material using current technology, leaving 0.5% of the feed reporting to the clay. For the old cyclones, the feed loss is approximately 1.0%. The mine plan provides the average matrix clay content; then the maximum matrix pumping rate can be estimated using the average clay content. Any time the washer is fed higher than this maximum rate, a higher feed loss will occur.

Samples are collected from each cyclone overflow and then processed in the lab to calculate the feed losses from each cyclone. If the feed loss is higher than 1.0%, action items will be taken to reduce the feed losses.

The cyclone is easily choked by wood or trash which reduces cyclone pressure and affects its performance. In addition, cyclone apex size significantly affects separating efficiency. To determine a correct cyclone apex size, samples will be collected from each cyclone underflow using a teapot sampler. The correct percent solids (by weight) of each cyclone underflow is approximately 55% by adjusting the apex size.

Sizing Area

South Fort Meade is different from the other beneficiation plants in that it includes three stages of sizing. The raw feed (unsized feed) is pumped to a secondary declay cyclone to remove clay and the underflow feeds the primary sizer. The overflow of the primary sizer feeds the fine flotation bins while the underflow of the primary sizer feeds the secondary sizer. The overflow of the secondary sizer reports to the coarse flotation bin and the underflow feeds the tertiary sizer. The overflow of tertiary sizer reports to the ultra-coarse feed bin while the underflow is pumped to the sizer rock bin as phosphate rock product or recycles back to the washer. South Fort Meade sizing generates four materials: sizer rock, ultra-coarse flotation feed, coarse flotation feed and fine flotation feed. The particle size is in the range of 16 to 20 mesh, 20 to 24 mesh, 24 to 35 mesh, and 35 to 150 mesh, respectively.

Four Corners has two stages of sizing. The unsized feed is pumped to a secondary declay cyclone to remove clay and the cyclone underflow goes to the hydrosizer. The overflow of the hydrosizer feeds the fine flotation bins while the underflow of the hydrosizer goes to the banana screens. The underflow of the banana screens reports to coarse flotation bin and the overflow of banana screens (IP or intermediate pebble) is a phosphate rock product. The particle size of Four Corners IP, coarse flotation feed and fine flotation feed is 16 to 24 mesh, 24 to 35 mesh, and 35 to 150 mesh, respectively.

Wingate plant has two steps of sizing – primary and secondary. The unsized feed goes to a secondary declay cyclone to remove clay. Cyclone underflow feeds the primary sizer. The overflow of primary sizer reports to the fine flotation feed bin while the underflow is pumped to scalp screen. The overflow of scalp screen is recycled back to trommel screen underflow tank and the underflow goes to the secondary sizer. The overflow of secondary sizer combines with primary sizer overflow and feeds the fine flotation circuits. The underflow of secondary sizer reports to the coarse flotation feed bin. The particle size of Wingate coarse flotation feed and fine flotation feed is 20 to 35 mesh and 35 to 150 mesh, respectively.

Flotation Area

Flotation was originally patented in 1906. It utilizes the differences in physical-chemical surface properties of particles. This may be a natural difference or a difference created by use of reagents. In some cases, increasing the differential in surface properties is required. It is applicable to almost any type of mineral. Approximately 65% of the total Florida phosphates produced is a result of flotation. Flotation allows the mining of low-grade and complex mineralization.

South Fort Meade has eight rougher flotation circuits using two different flotation machines. Circuit #1 to #5 are fine flotation circuits. The coarse circuit is designed to process coarse feed. The swing circuit can handle fine and coarse feed, allowing the plant to balance feed inventory.

The Four Corners plant has six rougher flotation circuits using mechanical cells. Wingate plant has four rougher circuits. The fine circuits use Mosaic columns while the coarse circuit uses belt flotation.

Proper conditioning of the flotation feed with fatty acid and oil is considered to be the most critical step to achieve the maximum recovery with good selectivity. The plants use vertical stirred tanks for conditioning except for Wingate coarse circuit which uses a drum conditioner.

Table 14-1 outlines the maximum feed rate of the flotation plants. To achieve an acceptable recovery, the flotation feed rate is targeted for 4,100, 1,900 and 1,100 tons/hour for Four Corners, South Fort Meade and Wingate flotation plants, respectively.

Table 14-1: Rougher Circuits Design Rate (tons/hour)

Circuit	Four Corners	South Fort Meade	Wingate
Fine Rougher	3,400	1,350	1,050
Coarse Rougher	700	430	50
Ultra-coarse Rougher	n/a	120	n/a
Total	**4,100**	**1,900**	**1,100**

Four Corners has six amine flotation circuits, four fine amine and two coarse amine flotation circuits. South Fort Meade has four amine flotation circuits, one coarse amine and three fine amines. Wingate has one amine flotation circuit that processes the rougher concentrates from all rougher circuits.

14.5 Equipment Characteristics and Specifications

Tables 14-2 summarizes the equipment specifications and sizing for the beneficiation plants.

Table 14-2: Equipment Summary

Equipment	Four Corners	South Fort Meade	Wingate
No. of Trommels	8	8	2
Trommel Diameter, ft.	10	7	8
Trommel Length, ft.	16	16	20
No. of Primary Washers	8	4	n/a
Log Diameter, inches	46	46	n/a
Log Length, ft.	30	35	n/a
No. of Secondary Washers	8	4	2
Diameter, inches	46	38	38
Length, ft.	30	30	30
No. of Upper Vibrating Screens	8	4	2
Screen Width, ft.	6	8	8
Screen Length, ft.	16	13	20
No. of Middle Vibrating Screens	8	4	2
Screen Width, ft.	6	6	8
Screen Length, ft.	16	13	20
No. of Lower Vibrating Screens	8	4	2
Screen Width, ft.	6	6	8
Screen Length, ft.	16	13	20

Equipment	Four Corners	South Fort Meade	Wingate
No. of Primary Cyclones	48	48	25
Cyclone Size (Diameter), inches	24	24	24 to 26
No. of Secondary Cyclones	32	8	4
Cyclone Size (Diameter), inches	24	30	24
No. of Primary Sizers	12	2	2
Primary Sizer Dimensions, ft.	10 x 10	20/14	7 x 19
No. of Secondary Sizers	6	2	2
Secondary Sizer Dimensions, ft.	21 x 9.5	9/6	7 x 19
No. of Tertiary Sizers	n/a	2	n/a
Tertiary Sizer Dimensions, ft.	n/a	5/3	n/a

14.6 Water Requirements

The total beneficiation plant water usage is approximately 150,000, 120,000 and 85,000 US gpm for Four Corners, South Fort Meade and Wingate, respectively. Water consumption is split between the washer (30%), sizing (30%) and flotation (40%). 95% of the production-water is recycled from the clay settling areas. A small amount of deep well water is used for reagent mixing and supplemental production water. Table 14-3 summarizes the past year deep well water usage for the three facilities.

Table 14-3: Plant Production and Deep Well Water Usage 2021

Location	Production (M tons)	Production (M tonnes)	Operation Hours	Deep Well Water (M cu m)	Deep Well Water (US gpm)	Deep Well Water (tons/US gal)
Four Corners	7.855	7.013	7,547	5.831	3,402	196
South Fort Meade	3.180	2.839	4,857	2.408	2,183	200
Wingate	1.147	1.024	6,096	3.241	2,341	747

14.7 Power and Consumables

Power is supplied by Duke Energy, TECO, PRECO and Florida Power. Mosaic also cogenerates its own power from New Wales and Bartow plants. A portion of this power is distributed to South Fort Meade and Four Corners. The annual power consumption is listed in the Table 14-4.

Table 14-4: 2021 Power Consumption

Supplier	Four Corners (kW)	South Fort Meade (kW)	Wingate (kW)
PRECO	35,164,250	0	0
Duke Energy	321,292,035	193,840,008	10,615,185
TECO	155,838,646	0	0
Florida Power	0	0	145,433,168
NW/SP Cogenerated	74,352,910	144,015,378	0
NW/SP Purchase	265,775,224	0	0
Total	**852,423,065**	**337,855,386**	**156,048,353**

The reagent consumption varies and depends on the reagent formula, flotation feed grade and production-water quality, etc. The purpose of each reagent is summarized below:

- Fatty acid: This reagent functions as a collector for the phosphate. It selectively coats the surface of the phosphate creating a hydrophobic surface.
- Oil: Oil is an extender for the fatty acid. It acts to increase the hydrophobicity of the fatty acid-coated phosphate surface. Oil also serves to change the surface tension of the froth phase.
- pH Modifier: pH Modifier is used to adjust the pH of the conditioning slurry. The fatty acid must be saponified first, which is accomplished by increasing the pH of the slurry.
- Surfactant: A surfactant is used to keep bubbles from coalescing. Fine bubbles are necessary to achieve good flotation recovery.
- Sodium Silicate: Sodium silicate is used to depress sand. It reduces the quantity of sand that reports to the rougher concentrate.
- Sulfuric acid: This reagent is used to remove the fatty acid and oil from the phosphate surface. After this step, there are no reagents attached to the phosphate mineral.
- Amine: Amine is the reagent for the collection of sand that facilitates the floatation of sand.

14.8 Key Metrics

The historical and projected future key metrics for the Four Corners, South Fort Meade and Wingate beneficiation plants have been tabulated in Table 14-5, 14-6, and 14-7, respectively. It should be noted that historical values listed in these three tables have been calculated from field level measurement and onsite metallurgical analysis. Future tonnage recoveries are calculated using a mass and energy balance software package that has been programmed to simulate the process. Recoveries are reported using a rolling three-year reconciliation process.

Table 14-5: Four Corners Key Beneficiation Plant Metrics

Year	2018 Actual	2019 Actual	2020 Actual	2021 Actual	2022 Fcast.	2023 Plan	2024 Plan	2025 Plan	2026 Plan	2027 Plan
Feed Volume, tons (x1000)	28,050.0	27,362.2	30,034.9	29,169.3	31,285.2	29,217.2	27,209.5	24,406.2	26,725.4	27,207.1
Feed Ton Recovery, %	111.0	107.0	107.4	104.4	100.0	100.0	100.0	100.0	100.0	100.0
Water Usage (estimate) X1000 Gal.	68,827,320	64,412,280	70,482,960	71,113,680	67,922,550	62,604,000	58,302,000	52,299,000	57,267,000	58,302,000
Flotation Recovery, %	87.3	88.9	89.5	89.0	88.8	88.8	88.8	88.8	88.8	88.8
Feed BPL	12.82	13.88	14.25	13.50	13.20	13.93	13.66	12.95	13.05	12.08
Concentrate Volume, ton	4,814,864	5,186,670	5,900,625	5,376,096	5,893,651	5,665,821	5,221,650	4,435,816	4,930,729	4,623,658
Concentrate BPL	65.2	65.1	64.9	65.2	63.9	63.8	63.2	63.3	62.8	63.1
Feed BPL Recovery, %	65.0	71.0	75.0	75.2	78.9	78.9	78.9	78.9	78.9	78.9
Matrix Volume, cubic yds	33,740,400	35,159,800	36,156,100	36,594,374	32,601,600	32,883,100	31,591,300	29,653,600	32,216,500	33,426,000
Tailings BPL Grade %	1.97	1.91	1.93	1.88	2.00	1.90	1.90	1.80	1.80	1.60
Tailing Volume, tons	22,216,897	22,175,519	23,848,216	23,518,561	25,391,500	23,551,400	21,987,800	19,970,400	21,794,700	22,583,500
Pebble Volume, tons	2,832,704	1,975,960	2,581,519	2,478,814	2,644,308	2,248,650	2,338,168	2,802,901	2,105,539	2,330,839
Pebble Recovery, %	105.0	111.0	107.1	96.5	97.2	97.2	97.2	97.2	97.2	97.2

Year	2018 Actual	2019 Actual	2020 Actual	2021 Actual	2022 Fcast.	2023 Plan	2024 Plan	2025 Plan	2026 Plan	2027 Plan
Sizer Volume, tons	28,333,913	27,647,182	30,041,404	30,732,415	31,691,908	29,597,024	27,563,224	24,723,481	27,072,830	27,560,792
Concentrate BPL Ton Recovery, %	63.0	67.8	72.1	69.9	70.1	70.1	70.1	70.1	70.1	70.1

Table 14-6: South Fort Meade Key Beneficiation Plant Metrics

Year	2018	2019	2020	2021	2022	2023	2024	2025	2026	2027
	Actual	Actual	Actual	Actual	Fcast.	Plan	Plan	Plan	Plan	Plan
Feed Volume, tons (x1000)	11,874.7	11,830.9	11,139.0	10,528,084	11,677.3	13,854.9	13,776.6	11,634.6	14,176.7	14,131.5
Feed Ton Recovery, %	118.0	117.5	109.6	109.6	109.6	141.7	141.7	141.7	130.0	130.0
Water Usage (estimate) X1000 Gal.	48,492,000	47,505,600	42,465,600	34,969,032	46,042,560	51,156000	50,868,000	42,955,200	52,344,000	52,178,400
Flotation Recovery, %	88.5	88.1	86.8	83.9	81.7	81.7	81.7	81.7	78.7	78.7
Feed BPL	15.14	14.54	12.92	8.84	8.11	7.61	8.98	9.27	5.79	7.47
Concentrate Volume, ton	2,449,795	2,321,060	1,930,418	1,249,868	1,305,268	1,364,632	1,640,632	1,388,665	1,006,794	1,294,801
Concentrate BPL	64.80	65.30	64.72	62.45	63.79	63.09	61.61	62.90	64.19	64.13
Feed BPL Recovery, %	66.5	67.5	68.1	68.1	65.5	65.5	65.5	65.5	68.1	68.1
Matrix Volume, cubic yds	12,753,300	14,229,600	14,993,683	9,214,593	12,589,400	10,837,100	11,129,200	9,741,400	11,381,400	12,085,200
Tailings BPL Grade %	2.18	2.14	2.06	1.61	1.11	1.50	1.90	2.00	1.30	1.80
Tailing Volume, tons	9,397,949	9,509,820	9,208,624	9,278,217	10,372,100	12,490,300	12,136,200	10,245,900	13,169,900	12,836,700
Pebble Volume, tons	2,219,801	2,356,470	2,156,214	1,930,117	2,041,110	1,601,809	1,524,155	1,676,048	2,362,689	2,925,659
Pebble Recovery, %	114.0	103.0	102.4	102.4	102.4	81.7	81.7	81.7	100.0	100.0
Sizer Volume, tons	12,230,941	12,185,827	11,422,920	9,004,360	11,629,773	13,798,511	13,720,529	11,587,247	14,119,001	14,073,985
Concentrate BPL Ton Recovery, %	69.4	69.9	64.8	62.6	63.1	75.8	75.8	75.8	69.7	69.7

Table 14-7: Wingate Key Beneficiation Plant Metrics

Year	2018	2019	2020	2021	2022	2023	2024	2025	2026	2027
	Actual	Actual	Actual	Actual	Fcast.	Plan	Plan	Plan	Plan	Plan
Feed Volume, tons (x1000)	5,963.2	6,412.1	5,100.9	5,154.3	6,341.0	6,323.9	5,853.1	6,021.6	6,094.2	6,161.8
Feed Ton Recovery, %	100.0	98.0	99.5	97.4	94.8	94.8	94.8	94.8	94.8	94.8
Water Usage (estimate) X1000 Gal.	33,819,732	30,871,116	28,637,316	31,087,050	32,339,100	32,252,400	29,850,300	30,712,200	31,079,400	31,426,200
Flotation Recovery, %	88.4	85.9	85.6	84.5	86.4	86.4	86.4	86.4	86.4	86.4
Feed BPL	13.46	13.18	12.71	12.86	10.94	14.42	16.57	20.79	16.70	13.86
Concentrate	1,089,666	1,104,934	839,618	867,076	915,243	1,210,634	1,284,555	1,648,891	1,341,272	1,126,474

Volume, ton	1,089,666	1,104,954	859,618	807,070	913,243	1,210,654	1,284,555	1,048,891	1,341,272	1,120,474
Concentrate BPL	65.1	65.7	66.1	64.6	65.7	65.1	65.2	65.6	65.6	65.5
Feed BPL Recovery, %	97.0	98.5	95.9	97.1	97.1	97.1	97.1	97.1	97.1	97.1
Matrix Volume, cubic yds	6,032,300	6,287,600	5,480,600	5,627,355	5,796,400	6,013,200	6,037,800	6,009,500	6,014,900	6,011,800
Tailings BPL Grade %	1.93	2.27	2.21	2.41	1.70	2.40	2.90	3.90	2.90	2.30
Tailing Volume, tons	4,873,558	5,307,203	4,261,246	4,287,191	5,425,757	5,113,300	4,568,600	4,372,700	4,752,900	5,035,300
Pebble Volume, tons	662,459	554,311	646,689	279,720	426,621	831,643	1,013,257	963,687	786,688	572,466
Pebble Recovery, %	85.0	83.0	84.5	94.3	94.3	87.8	87.8	87.8	87.8	87.8
Sizer Volume, tons	5,981,451	6,434,509	5,205,253	5,162,902	6,364,525	6.347,362	5,874,815	6,043,940	6,116,809	6,184,660
Concentrate BPL Ton Recovery, %	85.7	82.9	81.7	79.9	79.7	79.5	79.5	79.5	79.5	79.5

15.0 Infrastructure

15.1 Introduction

The three active mining facilities are in Hillsborough, Polk, Manatee and Hardee counties, Florida. The facilities are readily accessible from multiple paved public roads and are situated near several population centers, eliminating the need for onsite housing for working personnel.

The facilities have the infrastructure in place to meet current production goals and anticipated future expansion if needed. Internal infrastructure includes a Mosaic-owned power distribution system, railways, water supply systems, clay settling areas, a number of pumping systems and a network of access roads. These assets are inspected and maintained by Mosaic personnel and using third-party vendors and consultants to ensure the operation can meet current and anticipated future production expectations. Mosaic also relies on some infrastructure that is maintained by third parties (Table 15-1).

Table 15-1: Infrastructure Maintained by Third Parties

Infrastructure	Supplied and Maintained
Rail Network	CSX
Road Network	Florida Department of Transportation (FDOT)
Power	Duke Energy, TECO, PRECO, Florida Power, Mosaic cogeneration
Communications	Verizon

15.2 Roads, Rail and Logistics

15.2.1 South Fort Meade Facility

Primary access to the South Fort Meade Facility is through the main entrance road off County Line Road (Figure 15-1). The mining areas are accessed by County Line Rd, CR 657, CR 664A and CR 664B.

The primary entrance road to the beneficiation plant area including offices, maintenance shops and warehouse, is a paved road directly off County Line Road 664. This access point is monitored with a security guard gate and manned 24/7. Due to the large footprint, the mining areas have multiple access points. A system of unpaved dirt roads extends from these access points through infrastructure corridors allowing personnel to access production equipment, water storage areas and waste disposal areas. Higher volume main corridor roads are capped in rock and maintained regularly with motor graders.

Most equipment, parts and supplies to operate the mine are delivered via public roads and then utilize Mosaic's road network. Certain reagents used in the beneficiation process are delivered via CSX/Mosaic owned railways.

All phosphate rock at South Fort Meade is transported via rail to Mosaic chemical plants. South Fort Meade utilizes a 4.4 mile (7.0 km) Mosaic-owned railway spur and locomotive to transfer product rail cars to a transfer yard at which point CSX picks up and delivers product to the Mosaic fertilizer plants via CSX rail networks and locomotives. At South Fort Meade, truck haulage of phosphate rock on public roads is not permitted.

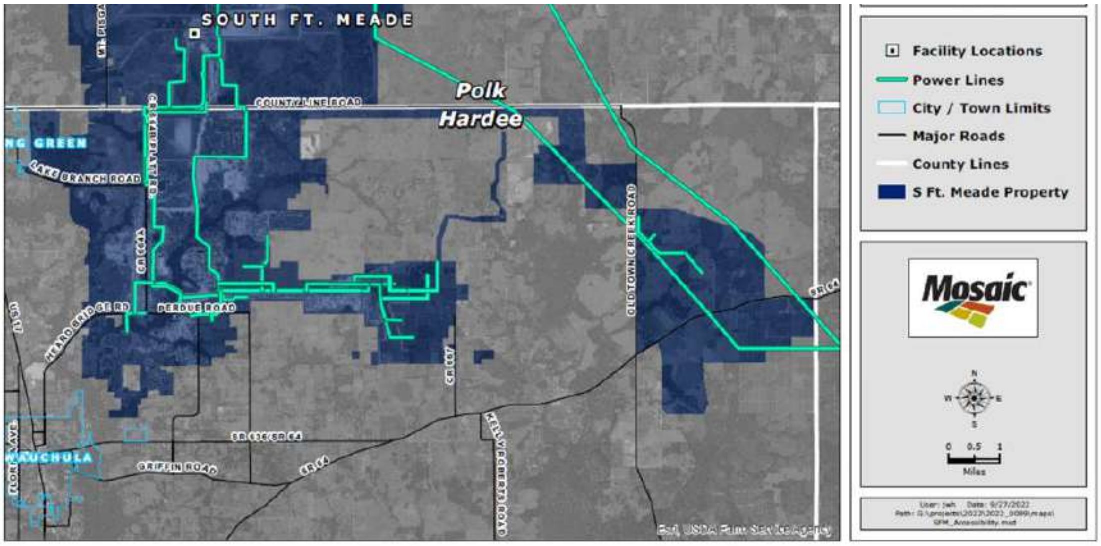


Figure 15-1: South Fort Meade Facility Major Roads and Logistics Infrastructure

15.2.2 Four Corners Facility

Primary access to the Four Corners Facility is through the Four Corners Mine Road entrance road off SR37 in Hillsborough County (Figure 15-2). The mining areas are accessed by SR37, SR39, SR62, Taylor-Gill Rd. and SR674.

Four Corners Mine Road is a paved road directly off Florida State Road 37 and is the primary entrance road to the beneficiation plant area including offices, maintenance shops and warehouse. This access point is monitored with a security guard gate and manned 24/7. Due to the large footprint, the mining areas have multiple access points. A system of unpaved dirt roads extends from these access points through infrastructure corridors allowing personnel to access production equipment, water storage areas and waste disposal areas. Higher volume main corridor roads are capped in rock and maintained regularly with a fleet of motor graders.

Most equipment, parts and supplies to operate the mine are delivered via public roads and then utilize the Mosaic road network. Certain reagents used in the beneficiation process are delivered via CSX/Mosaic owned railways.

All phosphate rock at the Four Corners site is transported by either truck or rail to Mosaic chemical plants. Four Corners utilizes a Mosaic-owned railway spur and locomotive to transfer product rail cars to a transfer yard at the Agrock location, from which point CSX picks up and delivers product to the Mosaic fertilizer plants via CSX rail networks and locomotives. Four Corners utilizes truck haulage of phosphate rock on public roads to supplement rail haulage depending on logistics timing and destination.

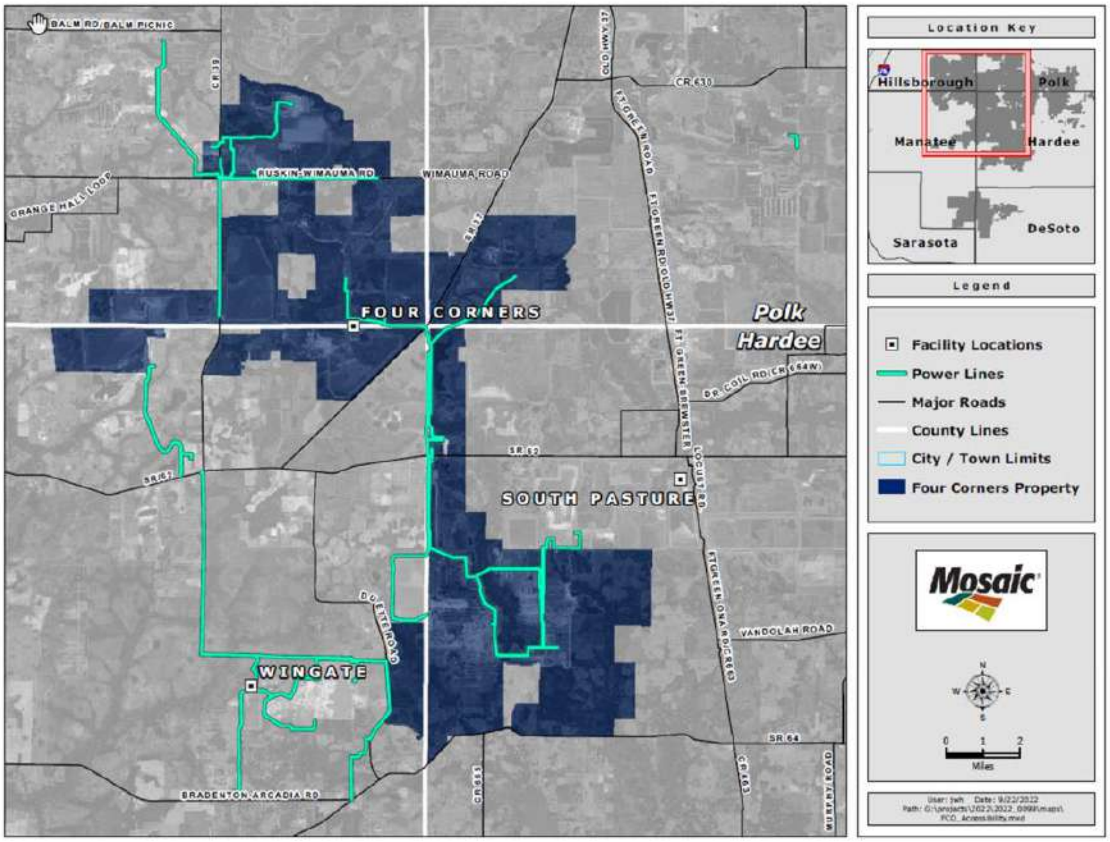


Figure 15-2: Four Corners Facility Major Roads and Logistics Infrastructure

15.2.3 Wingate Facility

Primary access to the Wingate Plant is through the Nu-Gulf Mine Road entrance off Duette Road in Manatee County (Figure 15-3). The mining areas are accessed from the main entrance road.

Nu-Gulf Mine Road is a paved road directly off County Line Road 664 and is the main entrance road to the beneficiation plant area including offices, maintenance shops and warehouse. This access point is monitored with a security guard gate and manned during day shift hours weekdays Monday through Friday. Mine areas are accessed from the entrance road and a system of unpaved dirt roads extending from these access points through infrastructure corridors allowing personnel to access production equipment, water storage areas and waste disposal areas. Higher volume main corridor roads are capped in rock and maintained regularly with a fleet of motor graders.

Most equipment, parts and supplies to operate the mine are delivered via public roads and then utilize the Mosaic road network. There is no rail service to the Wingate site.

All phosphate rock at Wingate is transported via truck to the Four Corners Facility for final shipping or directly to a Mosaic chemical plant. Wingate truck haulage of phosphate rock on public roads is only permitted using the Duette Road traveling north to SR62.

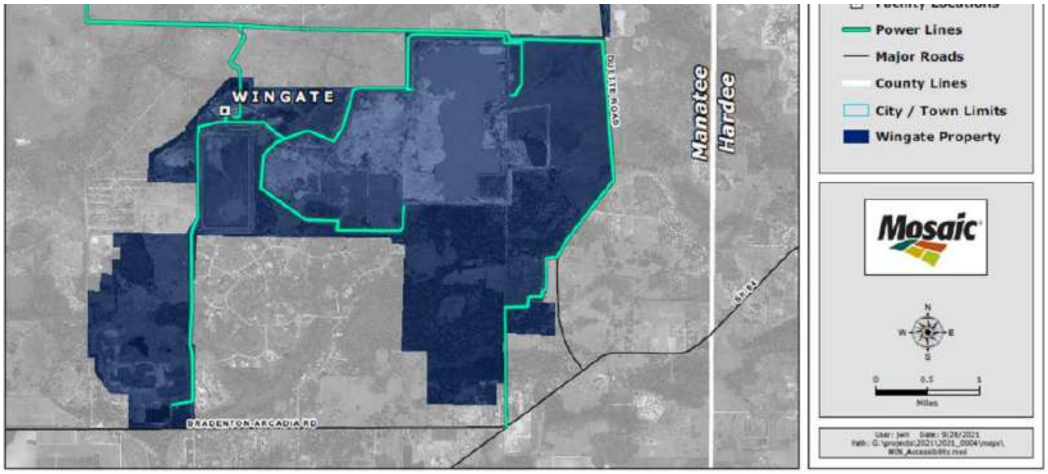


Figure 15-3: Wingate Facility Major Roads and Logistics Infrastructure

15.3 Stockpiles

15.3.1 South Fort Meade Facility

The South Fort Meade Facility produces a pebble and concentrate size fraction phosphate rock product. The pebble product is temporarily stored on the washer day pile and then transferred to the South Fort Meade phosphate rock stockpile. The stockpiles are located near the beneficiation plant (Figure 15-4) The concentrate size fraction product is transferred directly to the primary product stockpile. Product streams are segregated by product grade and deposited on the product stockpile using a large mobile stacker system. A system of gates and a loadout tunnel allow for Mosaic to blend phosphate rock as it is loaded into rail cars.

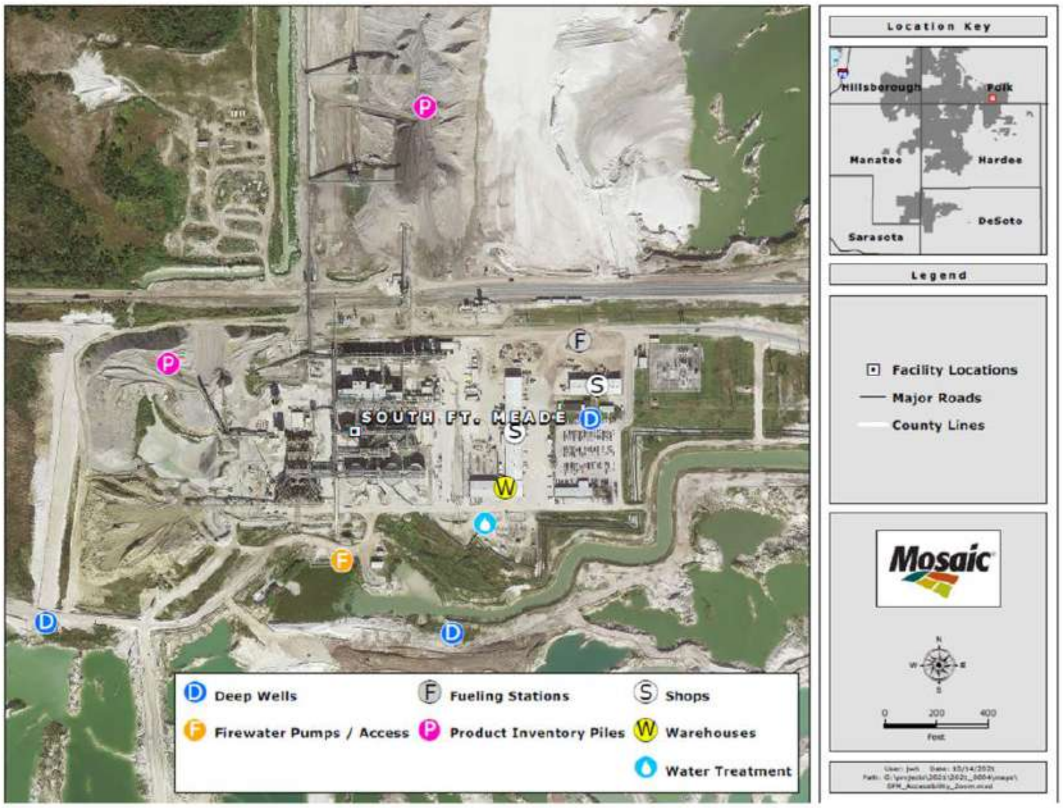


Figure 15-4: South Fort Meade Facility Beneficiation Plant and Related Infrastructure

15.3.2 Four Corners Facility

The Four Corners Facility produces a pebble and concentrate size fraction phosphate rock product. The pebble product is conveyed to the Four Corners primary product stockpile. The stockpiles are located near the beneficiation plant (Figure 15-5) The concentrate size fraction product is transferred directly to the primary product stockpile. Product streams are segregated by product grade and deposited on the product stockpile directly from the conveyor. A system of gates and a loadout tunnel allow for Mosaic to blend phosphate rock as it is loaded into rail cars. On-highway trucks are loaded by mobile equipment from the stockpile perimeters.

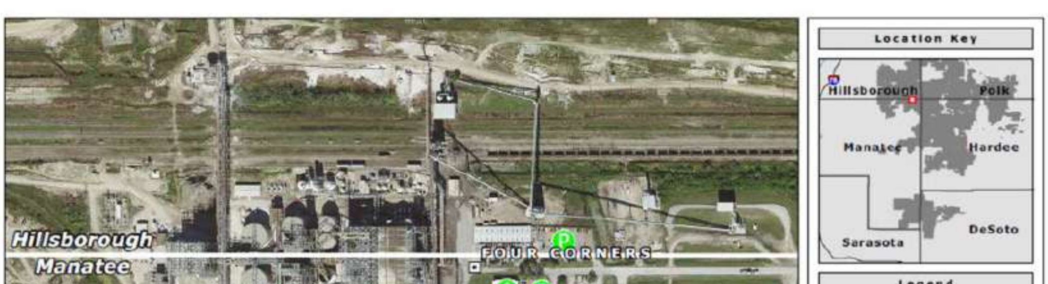


Figure 15-5: Four Corners Facility Beneficiation Plant and Related Infrastructure

15.3.3 Wingate Facility

The Wingate Facility produces a pebble and concentrate size fraction phosphate rock product. The pebble product is transported using a stationary stacker conveyor to the pebble product stockpile. The concentrate size fraction product is transported using a second stationary stacker conveyor directly to the concentrate product stockpile. Pebble (NW) and concentrate (NE) stockpiles are north of the beneficiation plant (Figure 15-6). Pebble and concentrate products are loaded into trucks from the perimeter of piles. Blends are accomplished by controlling the ratio of pebble and concentrate loaded in each truck and by number of total trucks shipped of each product.

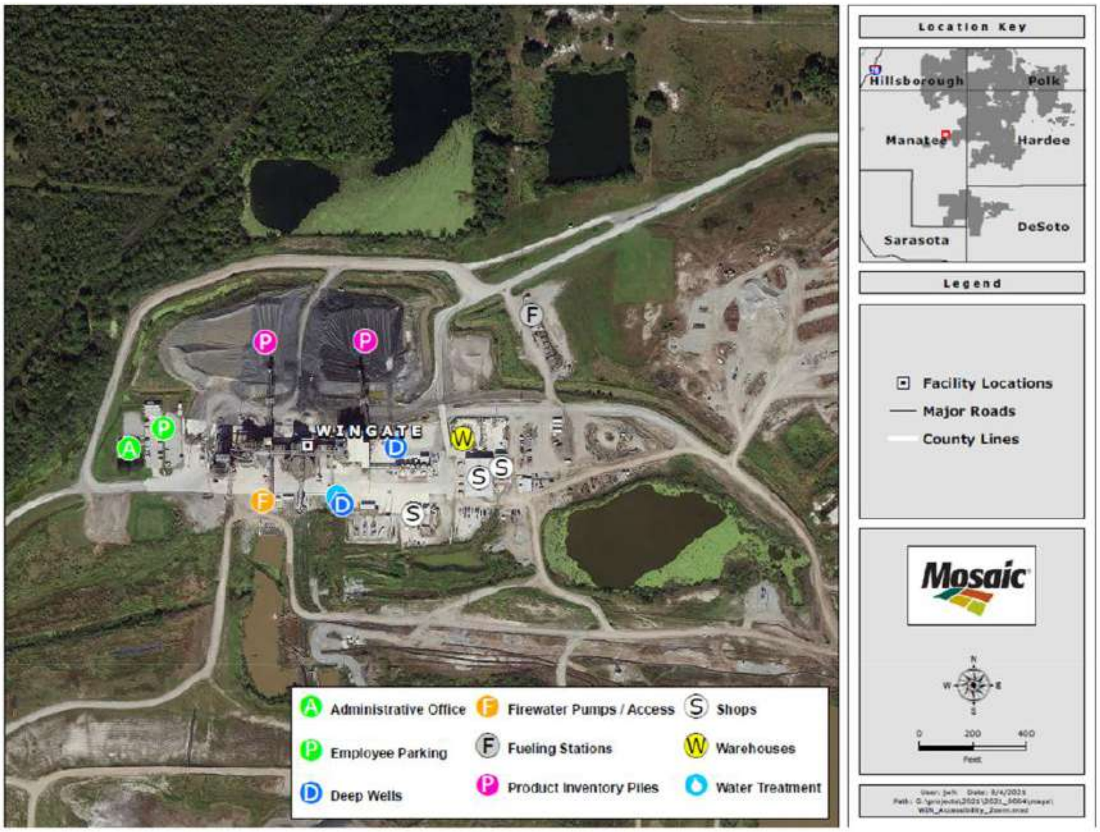


Figure 15-6: Wingate Facility Beneficiation Plant and Related Infrastructure

15.4 Clay and Tailings Storage

The South Fort Meade, Four Corners and Wingate phosphate facilities produce two primary tailings by-products from the beneficiation process: clays and sand tailings. Clays are pumped hydraulically via large diameter pumping systems to clay settling areas (CSAs) for storage, which are then subject to consolidation, decommissioning and reclamation. Sand tailings are pumped hydraulically to mine reclamation program areas where they are placed below grade and recontoured to match the approved reclamation topography. Areas that have been disturbed in the mining process must be reclaimed after mining operations are complete.

Clay Settling Areas (CSAs)

CSAs are earthen embankments approximately 40 to 60 ft. (12 to 18 m) high above the surrounding ground surface. Table 15-2 outlines the number and the storage available at each of the three operating facilities. The CSAs are engineered and constructed out of compacted competent soils under the direction of a third-party engineer with extensive expertise in such impoundments. As clays are hydraulically placed in the clay settling areas, clay particles consolidate and settle leaving a clarified supernatant that is subsequently decanted through spillway towers. Each CSA utilizes redundant spillways, each capable of passing the design storm and process flows. This decant water is returned to the beneficiation plant and field production areas through a network of above and below grade return water ditches. Mosaic maintains a minimum 5 ft. (1.5 m) of freeboard on all clay settling areas and a minimum 3 ft. (0.9 m) of freeboard on ditches.

Table 15-2: Current Clay Setting Areas Summary

Location	Number	Storage Available (Acre-ft.)	Storage Available (M yd3)	Storage Available (M m3)
South Fort Meade Facility	7	23,800	38.3	29.3
Four Corners Facility	13	68,000	109.6	83.8
Wingate Facility	3	23,100	37.3	28.5

Monitoring of the CSAs includes:

- Site visits and reviews by operations personnel twice a day. Their focus is to manage water levels and mine-wide water balance while complying to strict water level restrictions.
- Weekly inspections of the CSAs embankment by trained specialist technicians that monitor conditions including pore water pressures, erosion features, vegetation, seepage, cracks, sloughing, infrastructure and overall embankment integrity.
- An annual inspection by a Mosaic geotechnical engineering consultant, focusing on the CSA embankments.

South Fort Meade currently has seven active CSAs (Figure 15-7) with approximately 23,800 acre-ft. of total clay storage currently available. This remaining clay storage volume is adequate to meet the South Fort Meade 2022 LOM plan clay storage needs.

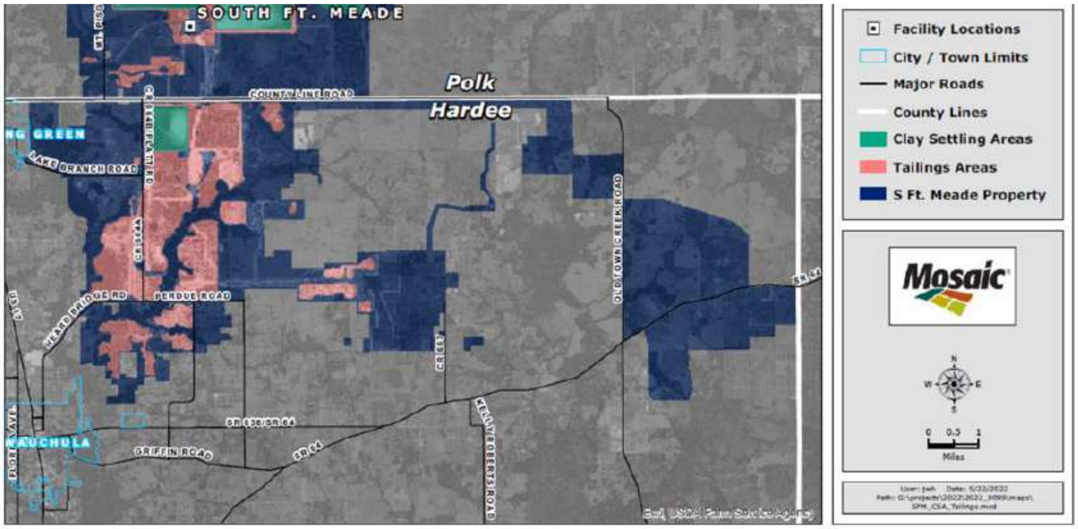


Figure 15-7: South Fort Meade Facility Clay Settling and Sand Tailings Locations

Four Corners currently has 13 active CSAs (Figure 15-8) with approximately 68,000 acre-ft. of clay storage currently available to final pool elevation. Four Corners currently has two CSAs under construction for future clay storage and eleven future CSAs planned in Hardee and Manatee Counties.

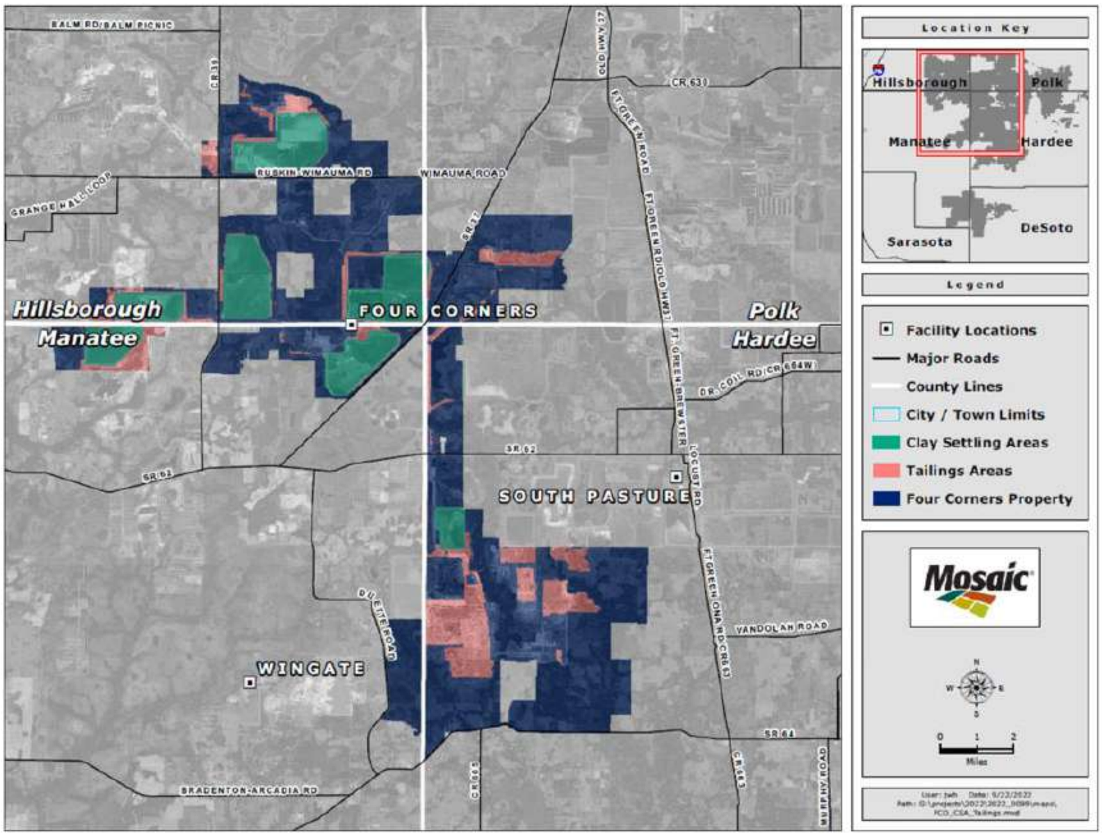


Figure 15-8: Four Corners Facility Clay Settling and Sand Tailings Locations

Wingate currently has three active CSAs (Figure 15-9) with approximately 23,100 acre-ft. of clay storage currently available. Wingate has one CSA, designated as ISA, that is active but at capacity and one (WC-1) planned for future construction. This additional clay settling pond is believed to be adequate to allow Wingate to meet its LOM plan clay storage needs.

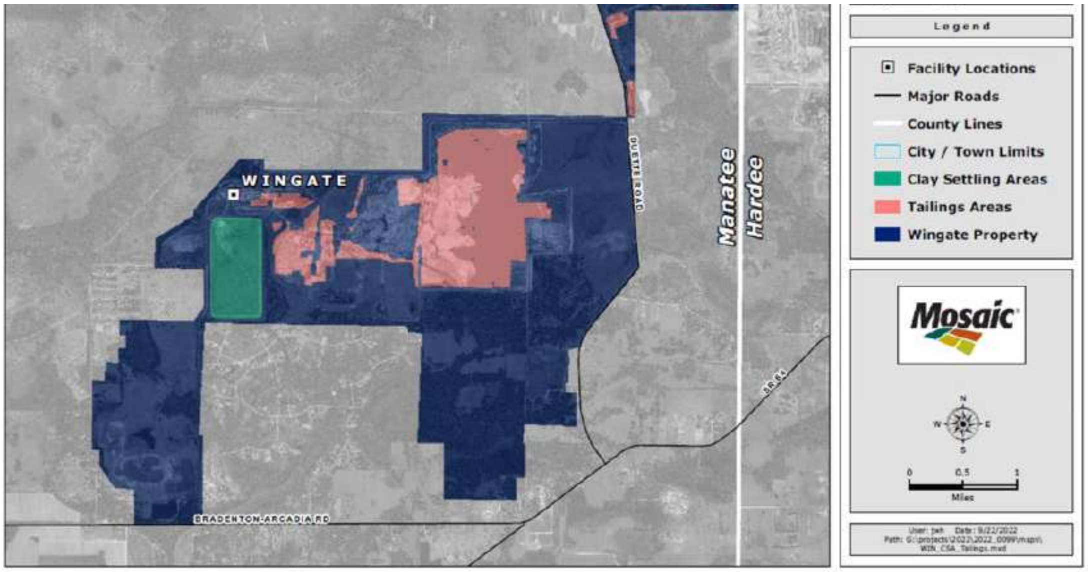


Figure 15-9: Wingate Facility Clay Settling and Sand Tailings Locations

Sand Tailings

Sand tailings are pumped hydraulically from beneficiation plants to mine reclamation program areas where they are placed below grade and recontoured to match the approved reclamation topography. As the sand tailings are pumped hydraulically to these areas, a fleet of heavy equipment places this material to the required grade. Water from the pumping process is captured in sumps and is pumped via diesel and electric pumps into the mine network of return water ditches.

Mine reclamation programs are identified in the permitting process and post-mining reclamation plans are planned at that time. Reclamation plans are based on permit conditions, regulatory requirements and post-reclamation land use. Reclamation programs are identified below, and sand tailings are used to achieve program contours.

Monitoring of the sand tailings areas:

- Water levels in reclamation area sumps are managed to strict water level restrictions and are inspected twice daily by operations personnel.
- All mine boundaries are protected by a BMP berm system to contain stormwater or production-water flows from leaving the property. The berms are passable by pickup trucks and inspected daily. Weekly inspections of the BMP berms are completed by trained specialist technicians that monitor conditions including erosion features, roadway condition, vegetation, cracks, sloughing and overall berm integrity.
- Mosaic reclamation personnel work in conjunction with various third-party contractors to place sand tailings on schedule and to final approved grade. Third-party contractors widely utilize GPS equipped earthmoving equipment to maintain actual grade to the planned grade.

15.5 Pumping Systems

Pumping systems are critical and widely utilized across the entire mining process. Detailed engineering is performed to properly size systems to meet production requirements and evenly distribute line pressure throughout the long pumping systems. Each facility has a maintenance department utilizing Mosaic and third-party specialists to monitor and maintain asset health using a variety of preventative and predictive maintenance practices.

Ore (matrix) and byproduct from the beneficiation plant are transported hydraulically, as a slurry, through a network of pipelines. Each mine utilizes large diameter centrifugal pumps, arranged in a series configuration to transport ore and waste streams long distances. Table 15-2 provides an overview of ore and waste stream pumping systems. These systems are operated by remote control by a single operator. Pumping assets are fully instrumented and data is logged in a data historian. Critical operating data from each asset is transmitted nearly instantaneously to operators so that any abnormal pumping system conditions can be rectified.

Reclaimed and recycled water is supplied to the remote mining areas using a network of pipelines and pumps. This water is boosted to 285 psi at the pits to assist in breaking down the ore into a pumpable slurry.

Multiple processes and technologies are utilized to maintain the asset health of pipelines and mechanical/electrical equipment. Each operation utilizes third-party technicians to measure steel pipe thicknesses using ultrasonic equipment. This data is used to manage a process of rolling (shifting pipe wear areas) and pipe replacements. Mine facilities use technicians to monitor vibration for mechanical equipment and measure powerline, substations and switchgear temperature using IR thermography. Each facility may be converted to conditional based online vibration monitoring in the future. Lubrication preventative maintenance and time interval-based inspections on mechanical equipment are completed at each site.

Pumping systems along with a system of sumps and mine recirculation ditches are used to maintain mine water balance and manage storm water. The facilities currently utilize a fleet of rental and Mosaic-owned pumps for this purpose.

15.5.1 South Fort Meade Facility

Table 15-3 outlines the South Fort Meade dragline ore and byproduct pumping systems.

Table 15-3: South Fort Meade Ore and Waste Stream Pumping Systems

	Pipeline			Pumps		
Type	**Miles in Service**	**Diameter (inches)**	**Type**	**Quantity**	**Size (inches)**	**Horsepower**
Ore (Matrix)	34	20	AR Steel	39	54	1,750 to 2,000
Clay	8	36 to 48	HDPE	4	42	1750
Sand Tailings	12	20	AR Steel	9	46	1,500 to 1,750
Water Supply to pits	8	24 to 42	Steel/HDPE	3	30 vertical	600
Water Boosters			Steel	6	50	1,500

15.5.2 Four Corners Facility

Table 15-4 outlines the Four Corners dragline ore and waste stream pumping systems.

Table 15-4: Four Corners Ore and Waste Stream Pumping Systems

	Pipeline			Pumps		
Type	**Miles in Service**	**Diameter (inches)**	**Type**	**Quantity**	**Size (inches)**	**Horsepower**
Ore (Matrix)	76	20/22	AR Steel	78	54	1,500 to 2,000
Clay	32	36 to 48	HDPE	7	42	1500 to 1750
Sand Tailings	35	24	AR Steel	26	46	1,500 to 2,000
Water Supply to pits		24	Steel/HDPE	6	30 vertical	600 to 1,500
Water Boosters	6	24	Steel	12	50	1,500

15.5.3 Wingate Facility

Table 15-5 outlines the Wingate dredge ore and by-product pumping systems.

Table 15-5: Wingate Ore and Waste Stream Pumping Systems

	Pipeline			Pumps		
Type	**Miles in Service**	**Diameter (inches)**	**Type**	**Quantity**	**Size (inches)**	**Horsepower**
Ore (Phosphator Dredge)	3	20	AR Steel	4	54	1,500 to 2,000
Overburden (Liberator Dredge)	1	26	AR Steel	7	54	1500 to 1750
Clay	14	36 to 48	HDPE	4	42	1500 to 1750
Sand Tailings	3	20	AR Steel	3	46	1,500
Water Supply to pits	n/a	n/a	n/a	n/a	n/a	n/a

15.6 Water Management Structures

All the phosphate facilities manage production-related and storm water flows through a complex system of ditches, spillways and pumping systems, and outfalls. They primarily operate on recirculated and storm water collected throughout its large footprint. Deep well pumps are available but provide a very small percentage of water required to operate the facility. Water is managed on a 24-hours, 365 days per year basis.

Due to the large facility footprint and rainfall that the area receives, stormwater management is of great importance. Stormwater is collected in open below grade mining cuts that are kept below levels to contain a 25-year stormwater event. The stormwater collected in these open cuts is primarily pumped to clay settling areas where it is clarified for use in the mine's production-related water streams. A large pipeline network consisting of Mosaic-owned or rented pumps is utilized for water management. Mosaic may treat or use a sand filter(s) to achieve water quality standards. Outfalls are managed by operations and environmental staff.

Mosaic has obtained a National Pollutant Discharge Elimination System (NPDES) permit that authorizes Four Corners to discharge water at a regulated quality and quantity from its nine permitted in-service outfalls as listed in Table 15-6.

Table 15-6: Four Corners Facility Permitted Outfalls

Outfall Number	County
MFC-D-001	Manatee
MFC-D-002	Polk
MFC-D-003	Hillsborough
MLS-D-006	Hillsborough
MLS-D-003	Hillsborough
MFG-D-002	Polk
MFG-D-003	Hardee
MFG-D-005	Polk
MFG-D-006	Hardee

Mosaic has obtained a NPDES permit that authorizes Wingate to discharge water at a regulated quality and quantity from its two permitted in-service outfalls, MWG-D-002 and 004, located in Manatee and Hardee counties respectively.

15.7 Built Infrastructure

The infrastructure built at the three operating mines includes:

- Beneficiation plant area includes office buildings, maintenance shops, warehouse and employee parking. Backup generators are in place for the main office building.
- A potable water well is located in the plant area.
- Plant and office areas utilize an effluent wastewater treatment system.
- Emergency fire suppression water is provided by a diesel unit located at the beneficiation plant hydraulic.
- A combination of wireless and fiber optic networks is used for pumping system telemetry over the long pumping distances.

- South Fort Meade uses dedicated radio channels and third-party cellular service for all mine communications.

15.8 Power and Electrical

15.8.1 South Fort Meade Facility

Duke Energy and the Mosaic cogeneration line from the Bartow chemical plant supply power to the South Fort Meade mine. The beneficiation plant can be powered by Duke Energy or Bartow cogeneration, while the mining area can only be powered by Duke Energy. South Fort Meade uses 30% cogenerated and 70% Duke Energy power.

Duke Energy supplies 230 kV power from Hines Power Plant in Fort Meade Florida through the 230 kV transmission line. Redundant 230 kV power can be supplied by the Duke Energy grid in central Florida. The 230 kV power is routed through Duke Energy's South Polk Substation and is converted to 115 kV power that then runs via Duke-owned and operated overhead power lines to two Duke 115 to 25 kV substations (South Fort Meade and Lake Branch), and one 115 to 69 kV substation (Parker Branch).

The northern, western and southern areas of the operation are supplied by 25 kV overhead powerlines with current mining in the east powered by 69 kV powerlines. Mosaic utilizes a fleet of 38 25 kV to 4160/7200 V and 12 69 kV to 4160/7200 V substations to distribute power to electrically powered assets through areas of the mine. Individual assets are powered using fully insulated and sealed power cables.

Diesel powered assets are used in particularly remote areas where electrical power distribution is impractical.

15.8.2 Four Corners Facility

Duke Energy, PRECO, TECO and the Mosaic cogeneration line from the Bartow chemical plant supply power to the Four Corners mine. The beneficiation plant can be powered by Duke Energy or Bartow cogeneration, while the field can only be powered by Duke Energy. Four Corners mine presently uses approximately 15% cogenerated and 85% purchase power.

Power is supplied at 69kV. Mosaic uses a fleet of 69 kV to 4160V and 7200 V substations to distribute power to electrically powered assets through areas of the mine. Individual assets are powered using fully insulated and sealed power cables.

Diesel powered assets are used in particularly remote areas where electrical power distribution is impractical.

15.8.3 Wingate Facility

Florida Power and Duke Energy supply power to the Wingate mine. The beneficiation plant and mining activities are powered by Florida Power while water return from the FM-1 and FM-2 clay settling pond is powered by Duke Energy. Wingate uses 10% Duke Energy and 90% Florida Power. Cogenerated power is not available for Wingate operations.

Power is supplied at 69kV. Mosaic uses a fleet of 69 kV to 4160 V and 7200 V substations to distribute power to electrically powered assets through areas of the mine. Individual assets are powered using fully insulated and sealed power cables.

Diesel powered assets are used in particularly remote areas where electrical power distribution is impractical.

15.9 Water Supply

Potable water is supplied from wells in the footprint of the beneficiation plant or mine areas.

Production-related water for beneficiation plant and field operations is mostly supplied by a recirculating water system distributed over the mine's large footprint. Clarified water streams are combined with collected stormwater and groundwater intrusion to supply most of the mine's water needs; however, supplemental production deep wells are available in the beneficiation plant area of each operation, if needed.

Large, centrifugal slurry pumps require water for reliable operation. This water is supplied by either deep wells or the recirculating water system.

16.0 Market Studies and Contracts

16.1 Markets

Phosphorus is one of the three primary crop nutrients required for plant growth and is not substitutable. Phosphate rock is the raw material feedstock utilized to produce virtually all phosphate fertilizers worldwide, as well as being the phosphate feedstock for animal feed ingredients and industrial and food products. Production of phosphate end-products is most commonly achieved by reacting the phosphate rock with sulphuric acid to produce intermediate phosphoric acid, which is then used as the precursor for nearly all high-analysis granular phosphate fertilizers (e.g., ammonium phosphates) as well as most animal feed and industrial/food phosphates. A less common process route involves reacting phosphate rock with sulphuric acid to produce single superphosphate, a low-analysis phosphate fertilizer.

The global market for phosphate rock is estimated to be approximately 205 M tonnes in 2022 and has grown at a compound annual growth rate of around 2% over the past two decades, though growth has slowed to circa 1% per annum over the past several years (CRU Phosphate Rock Market Outlook Database, September 2022). Going forward, global phosphate rock demand growth is expected to continue to grow, with Mosaic and independent analysts typically projecting a growth rate of 1-2% per annum. This growth ensures sufficient market demand for continued production at Mosaic's Florida phosphate rock mines. In fact, such demand growth will necessitate some combination of new mining capacity globally or higher operating rates at existing mines to meet the growing demand.

Global phosphate rock trade has been rangebound at around 30 M tonnes for the past two decades.

The Florida phosphate rock mines produce circa 13 million tonnes of phosphate rock concentrate per annum that is further processed into finished products at nearby downstream phosphate production facilities – i.e., phosphoric acid intermediate product, then phosphate fertilizers and animal feed phosphates. A small volume of phosphate rock is also shipped to Mosaic's downstream facility at Uncle Sam, Louisiana.

The open pit mining and beneficiation practices at the Florida mines result in a phosphate rock product with a grade of ~62% BPL (~28.5% P_2O_5) and is amendable as feedstock for phosphoric acid (and downstream high-analysis phosphate end-products).

16.2 Commodity Price Forecasts

All phosphate rock produced in Florida is consumed internally for downstream phosphate fertilizer manufacturing. There is no quoted benchmark for phosphate rock in Florida (nor elsewhere in the United States), as such, a phosphate rock internal transfer price forecast was constructed. To do so, CRU's benchmark forecasts for downstream phosphate products – into which Mosaic's Florida phosphate rock production is processed – were utilized to derive an available margin to fund the production of the phosphate rock raw material. Costs (raw material costs such as sulphur and ammonia, labor, overhead, capital, etc.) associated with converting phosphate rock into downstream finished product sold to external customers were subtracted from the downstream product price. For the purposes of modeling the ammonia and sulphur costs, CRU forecasts were also utilized, along with a forecast for natural gas utilizing the New York Mercantile Exchange Henry Hub forward curve which is a component to estimate the costs of ammonia purchased under the long-term contract with CF Industries as well as Mosaic's own production.

In other words, if the total cost of producing phosphate rock from Mosaic's Florida facilities is less than the expected margin available to fund phosphate rock production based on the raw material and finished product forecasts reference above, then the phosphate rock mining activity is deemed economic. For further detail on the analysis, refer to Section 19 (Economic Analysis) of this report.

The phosphate fertilizer price forecast from CRU utilized in the above methodology is Diammonium Phosphate (DAP) FOB NOLA (New Orleans, Louisiana), from CRU's Phosphate Fertilizer Market Outlook dated August 2022. This price is then adjusted for freight utilizing Mosaic's freight standards to derive a FOB plant netback and then adjusted to reflect the historical pricing differential for the various phosphate end-products other than DAP that are produced by Mosaic to arrive

at an average annual fertilizer price for the period 2023-2026. The arithmetic average of this period was then utilized for 2027 and all subsequent years of the forecast period through the life of mine. This average fertilizer price is $511 per tonne.

Similar methodology was applied to the downstream operations costs for sulphur and ammonia, along with internal forecasts for the remaining costs. The arithmetic average of the 2023-2027 period of these costs is $243 per tonne, leaving a margin before phosphate rock costs of $135 per tonne. This is referred to as Gross Margin Available (GMA).

Under this approach, the phosphate rock internal transfer price cannot exceed the GMA. The discounted cash flow (DCF) in Section 19.0 was calculated using the Internal Transfer Price (ITP) of phosphate rock to show a Net Present Value of zero. The ITP per tonne in the DCF is $68 which is significantly less than the GMA of $135. Refer to the economic section of the report for further detail on this methodology.

16.3 Contracts

Effectively all phosphate rock produced in Florida is consumed at Mosaic's nearby downstream facilities.

17.0 Environmental Studies, Permitting and Plans, Negotiations or Agreements with Local Individuals or Groups

17.1 Introduction

The Environmental Section of this document (Section 17) mainly focuses on the permitted and active phosphate facilities, consisting of South Fort Meade (SFM), Four Corners (FCO), and Wingate (WIN). Discussion of each mine in this section also includes associated extension tracts or infill parcels.

Some discussion in this Environmental section also includes the exploration properties South Pasture (SP), DeSoto and Pioneer. Although not an active phosphate facility, SP, including the South Pasture Extension (SPE), has obtained required permits and continues to maintain some of the same environmental requirements as the active sites. Properties such as DeSoto and Pioneer, although not fully permitted, may be included in certain subsections of this Environmental section and will be specifically referenced. If not specifically referenced, the discussion only applies to the active phosphate facilities previously mentioned.

17.2 Baseline and Supporting Studies

Prior to initiating mining operations on any tract of land, Mosaic must obtain federal, state and local approvals. As more fully described in the permits section below (Section 17.8), these approvals authorize Mosaic to conduct its mining, reclamation and mitigation plans on each tract without the need for renewals (i.e., "Life of Mine" approvals).

Mosaic's permitted mine boundaries have been addressed in either an environmental impact statement (EIS) or an environmental assessment (EA) to fulfill requirements under the federal National Environmental Policy Act (NEPA).

Prior to 2011, Mosaic's mine sites were subject to review and approval under the Development of Regional Impact (DRI) process (Section 380.0651(2)(t), F.S.). The DRI process has been replaced by each county's own Land Development Code (LDC) that regulate phosphate mining.

Those regulatory processes require collection of baseline data and studies addressing potential impacts, that inform a regulator's decision about whether to issue the permits and approvals. Additionally, applications for Florida Wetland Resource Permit (WRP) or an Environmental Resource Permits (ERP) require baseline data and impact analyses that are focused on environmental resources (Table 17-1).

Table 17-1: Baseline Monitoring and Impact Analyses

	NEPA	DRI/LDC	ERP/WRP
Map Land Covers	x	x	x
Delineate Wetlands	x	x	x
Wetland Functional Value	x	x	x
Wildlife Surveys	x	x	x
Threatened & Endangered (T&E) Species	x	x	x
Surface Water Flow	x	x	x
Surface Water Quality	x	x	x
Groundwater Aquifers	x	x	
Groundwater Quality	x	x	x
Soils	x	x	x
Flooding Potential/Floodplains	x	x	x
Water Supply	x	x	
Stormwater Runoff	x	x	x
Wastewater Discharge	x	x	
Solid/Hazardous Waste	x	x	
Air Quality/Noise	x	x	
Cultural Resources	x	x	x

Collectively, the baseline monitoring data and impact analyses and related modeling provide agency decisionmakers with the data necessary to determine that the following criteria for issuance have been met, including consideration of secondary and cumulative impacts:

- Wetland impact and avoidance plans were found to be the least environmentally damaging practicable alternative, as required by the CWA and Florida law.
- Wetland mitigation plans result in no net loss of wetland functions.
- Surface water quality meets designated Florida standards.
- Mining and reclamation are not expected to cause downstream flow volumes in streams to fall below minimum levels established by Florida law.
- Measures implemented to prevent offsite impacts from mine dewatering have proven effective.

- Groundwater quality beneath and adjacent to the mine meets designated Florida standards.
- Mining and reclamation are not expected to adversely affect public water supplies.
- No prime farmland was present prior to mining.
- Mining and reclamation are not expected to cause increases in downstream flood levels/impacts.
- Stormwater runoff following 25-year and 100-year 24-hour storm events is not expected to increase materially.
- No critical habitat for threatened or endangered species was present prior to mining.
- Mining and reclamation are not expected to adversely affect any threatened or endangered species.
- National ambient air quality standards are being met during mining.
- Noise and light levels generated by mining operations conform with current county land development code limits.
- Discharges of excess production-water and stormwater are not toxic to fish and aquatic organisms and have not been demonstrated to cause or contribute to violations of Florida's surface waters standards.
- No significant cultural resources have been found and if found, would be avoided or mitigated in accordance with regulations.

17.3 Environmental Considerations and Monitoring Programs

The permits and approvals under which Mosaic operates each mine site prescribe performance standards that are protective of the environment with respect to unavoidable but minimized impacts to wetlands and waterways, air quality, and water supply and quality, along with requirements to monitor each on a routine schedule. Also imposed are requirements to develop and implement management plans to address mine dewatering, wildlife habitat and listed species, spill prevention and control, pollution prevention and hazardous waste management. Protection of environmentally sensitive lands can be addressed in a conservation easement, together with reclamation and mitigation requirements addressed below. Routine reporting of environmental conditions, as well as upsets or incidents, is required. In addition, Mosaic conducts other voluntary programs described below in Section 17.9.

17.3.1 Performance Standards, Monitoring and Reporting

Permits and approvals impose requirements to meet regulatory criteria and standards, monitor conformance with those requirements, and report the monitoring results. Table 17-2 below provides the main water quality/quantity monitoring and reporting requirements that are required at each mine site.

Table 17-2: Monitoring and Reporting Requirements

Permit/Approval	Performance Standards	Monitoring	Reporting
National Pollutant Discharge Elimination System (NPDES)	Surface Water Quality, Groundwater quality, Effluent quality, Aquatic toxicity	Weekly, monthly, quarterly, semi-annually	Monthly, quarterly, semi-annually, annually, incident
Water Use Permit (WUP)	Water Levels	Weekly, monthly	Monthly, semi-annually, annually, incident
Wetland Resource Permit (WRP)	Surface Water Quality	Monthly, quarterly	Annual
Environmental Resource Permit (ERP)	Surface Water Quality, Groundwater quality	Monthly, quarterly	Annual, Incident
Development of Regional Impact (DRI)/County Land Development Code (LDC)	Surface Water Quality, Groundwater quality, Water Levels, Air Quality	Monthly, quarterly	Annual, quarterly, incident

Monitoring data is submitted to each applicable agency according to the terms of relevant approvals. In 2021, there was one NPDES permit limit exceedance for turbidity that occurred at a Four Corners outfall due to Hurricane Elsa and in 2022 there was also one NPDES permit limit exceedance for turbidity at a South Fort Meade outfall due to Hurricane Ian. Other sporadic deviations have occurred historically; however, these noted above and all prior permit excursions have since been reversed or resolved.

Similarly, reportable incidents have occurred infrequently in the past. In 2021, there were two releases that required notification to the Florida State Watch Office and a Public Notice of Pollution. One incident occurred at the South Pasture property, while the other occurred at the Four Corners facility. In 2022, there was one release that required the same notifications at the Four Corners facility. All of these incidents have since been resolved. Additionally, due to Hurricane Ian in 2022, notifications to the Florida State Watch Office and Public Notices of Pollution were made for unauthorized stormwater discharges at both the Four Corners facility and the South Fort Meade facility.

17.3.2 Management Plans

Management plans are an integral component of permit conditions designed to be protective of environmental conditions on and adjacent to Mosaic's active mine sites. Table 17-3 below provides a list of management plans that are required by permits at each mine site. While this list is not inclusive of every required environmental plan for Mosaic's mine sites, it does cover the main plans utilized by each facility.

Table 17-3: Permit Required Management Plans

Permit	Plan Required	Purpose
Integrated water use permit (IWUP)	Environmental Management Plan	Prevent water table drawdown
National pollutant discharge elimination system permit (NPDES)	Spill prevention, control, and countermeasures plan (SPCC)	Protect water quality
National pollutant discharge elimination system permit (NPDES)	Best management practices/pollution prevention plan (BMP3)	Protect water quality
Certain Environmental Resource Permits (ERPs)	Wildlife habitat management plan (WHMP)	Protect habitat and listed species

17.3.3 Resource Protection and Conservation Easements

Conservation Easements (CEs) may be required by the WRP/ERP or the federal wetland permit (hereafter, 404 Permit) to provide permanent protection for existing preserved wetlands and for compensatory wetland and stream mitigation required to offset impacts at each mine site. The onsite resource protection measures consist of three categories: land avoided by mining disturbance (referred to as preservation areas); certain wetlands and streams created following mining; and restored/reclaimed crossings of waterways otherwise preserved. In certain permits, Mosaic has also agreed to execute CEs over land that is outside of the mine boundary but included as a component of the overall mitigation plan.

The CEs impose upon Mosaic obligations to manage the easement areas to conserve existing environmental attributes. Agencies periodically inspect the condition of easement areas. Mosaic is in conformance with these requirements. Table 17-4 provides an acreage summary of CEs that have been executed within the active phosphate facilities and at the South Pasture property.

Table 17-4: Conservation Easement Summary

Location	Acres Executed
Four Corners Facility	7,662
South Fort Meade Facility	8,283
South Pasture Property	4,147
Wingate Facility	1,425

17.3.4 Non-Regulatory Programs

In addition to the above-described programs and plans, Mosaic has implemented other monitoring programs that are not required by permit conditions. These programs are typically the result of an agreement with a third-party organization and are addressed within Section 17.9 below.

17.4 Product and Rock Stockpiles

The phosphate rock product is stockpiled at the beneficiation plant prior to loading into trucks or rail cars for shipment to one of Mosaic's concentrates plants. Some off-specification phosphate rock (e.g., low-grade or high impurities) is also produced depending on the geology of specific areas being mined. Off-specification rock is either reprocessed through the

beneficiation plant, utilized for internal mine road stability or stockpiled at the plant for use in reclamation at the end of the life of the mine.

17.5 Tailings Storage Facilities

The phosphate ore is a matrix of phosphate rock, sand and clay at varying percentages as defined by particle size. The coarsest size, referred to as "pebble," is recovered by screening, without use of any reagent chemicals, and is transferred to the product stockpile as described above. The following two subsections describe the remaining particle size separation process and the tailings that are generated.

17.5.1 Flotation Tailings

The sand-sized ore is comprised of a mixture of phosphate rock product and barren silica quartz sand. Ore separation is

The sand-sized ore is comprised of a mixture of phosphate rock product and barren silica quartz sand. Ore separation is accomplished using a two-stage flotation process that applies sulfuric acid, oil and proprietary amine-based reagents. While the residual quartz sand is referred to as tailings, the particle size composition is much larger than tailings generated by hard rock mining operations and does not require use of impoundments. Instead, the tailings are used to backfill mine voids via hydraulic deposition in advance of reclamation.

The hydraulic deposition of tailings in mine voids is regulated as a discharge to groundwater by a mine's NPDES permit. Annual monitoring is required to document that tailings deposition is not negatively impacting groundwater.

17.5.2 Clay-Sized Residuals

Washing, screening and gravity separation methods are used to separate particles too fine to be effectively separated by flotation. These particles pass through 200 mesh screens and are referred to as "clay," but are comprised of clay minerals such as montmorillonite along with similarly-sized fine particles of phosphate rock and silica sand.

Clay Settling Area Impounds

The clay-sized residuals are pumped as a 3 to 5% solids slurry into above-grade impoundments referred to as clay settling areas (CSAs).

CSA Design and Operating Requirements

The WRP/ERP and county approvals specify the number, locations, sizes and volumes of CSAs authorized to be constructed and operated. Specific conditions of the ERP and county approvals require periodic revisions to projections for the future CSA capacity needs to minimize the overall CSA footprint required. Mosaic is in compliance with these conditions.

Chapter 62-672, Florida Administrative Code (F.A.C.) along with local development regulations and approvals provide specific requirements for the design (including site investigation), operation, maintenance, inspection and closure of CSAs. The construction and operation of CSAs is generally authorized by a new, or a modification to an existing, NPDES permit. By Florida law, third-party engineers are required to conduct all engineering evaluations, prepare designs, certify construction, and perform annual inspections of all CSAs. In accordance with applicable rules and standards, emergency response plans are developed for each CSA to document procedures and actions that are to be followed in the event of an emergency CSA condition. CSAs are required to be inspected daily by trained operations personnel and weekly by highly trained geotechnical inspectors. As part of the weekly inspection, piezometers are read and reviewed and compared against design specifications by site geotechnical engineers.

CSA Dam Closure Requirements and Reclamation

Each CSA is filled with the dilute clay slurry generated at the beneficiation plant until the fluid levels reach the maximum allowable level. The slurry undergoes a natural gravity settling and consolidation process, without the addition of flocculants or other additives, with the clean water decanted to provide recycled water supply for operations or discharged to a receiving stream through a NPDES outfall. CSAs are subjected to a stage filling process where these phases are repeated to maximize the volume of solids stored.

Once a CSA has been filled to its capacity, low ground pressure earthmoving equipment is used to develop a solidified surface, or crust. Once the crust has been fully developed and all standing water drained via a network of surface ditches, a closure design and plan is developed by a third-party engineer for approval via modification of the NPDES permit. Once the closure design is approved, the dam wall is excavated, or breached, to preclude its ability to impound water under FDEP's rules, and reclamation of the area is initiated in accordance with the Conceptual Reclamation Plan (CRP).

17.6 Water Management

Mining and ore processing is water reliant. Extracted ore is pumped to the beneficiation plant in pipelines. At the beneficiation plant, ore slurries are first washed and screened, with the sand sized fraction then subjected to flotation. The sand and clay residuals are hydraulically transported in pipelines to reclamation backfill sites and CSAs, respectively (Figure 17-1).

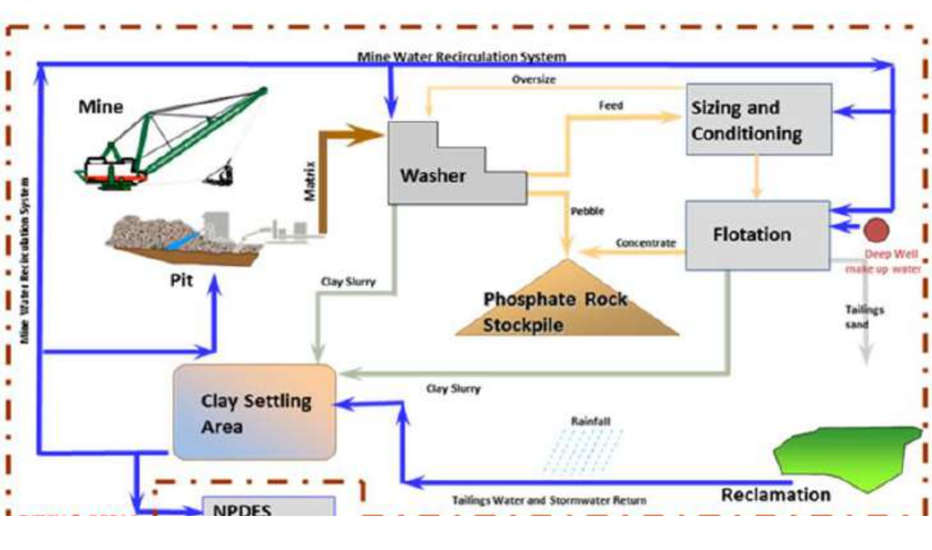


Figure 17-1: Mine Process Flow Diagram

Wide variations in the volumes of water withdrawn from the deep wells or discharged through a NPDES outfall have occurred historically and will occur in the future. These variations have been, and will continue to be, driven by variations in rainfall received. During droughts, little, if any, water is released through the NPDES outfall and deep well withdrawals are typically required to provide the make up water supply. In contrast, during wet years, little to no groundwater is required, but discharges through the NPDES outfall can occur on a near-continuous basis during the wet season.

17.6.1 Sources and Uses of Water

The sources of supply include rainfall; treated effluent from local municipalities; groundwater contained in the overburden sands and the ore matrix; and groundwater withdrawn from the mine production and dewatering wells. Rainfall captured by perimeter berms encompassing active mining and reclamation areas is the predominant source of water and the most variable.

Groundwater contained in the overburden sands and the ore matrix (i.e., interstitial water) is a consistent and sizeable source of water. Groundwater volumes withdrawn from the Floridan aquifer are highly variable and countercyclical to rainfall.

Mine uses of water consist of slurry transport of ore to the beneficiation plant and processing in the plant, transportation of the sand tailings to reclamation areas or stockpiles, transportation of clay to the CSAs, and other mining activities. Uses and disposition of water at the mine consist of evapotranspiration, rehydration of the surficial aquifer following mining, recharge of the surficial aquifer adjacent to the perimeter ditch and berm systems, moisture contained in product, and surface water discharges through an approved NPDES outfall. Evapotranspiration losses are predominant and vary somewhat based upon rainfall levels and general weather patterns. Rehydration of the surficial aquifer is a consistent and sizeable use of water following mining. Recharge of the surficial aquifer is a sizeable use that is somewhat countercyclical to rainfall. Surface water discharges are highly variable and generally occur coincidentally with rainfall. Moisture contained in product shipments is a small and consistent use.

17.6.2 Water Recycling

The well withdrawal and water discharge volumes provided above represent net demands in terms of aquifer withdrawals and surface water discharges. Within an active mine, however, daily recirculation and re-use volumes generally exceed 100 M US gallons per day and the recirculation system contains over one billion gallons of water. During the Florida wet season (late May – mid-October), rainfall and recirculation typically provide all of the water needed to operate the mine. Discharges occur when the recirculation system is adequately filled by rainfall and provides a surplus to the operational demand; similarly, aquifer withdrawals occur when dry periods create the need for makeup water. On average, less than ten percent of the mine water requirements are supplied by the aquifer well water withdrawals.

17.6.3 Effects of Water Withdrawals

Permits issued by the Southwest Florida Water Management District (SWFWMD) authorize use of the production wells to provide water for mining and beneficiation plant operations. A major component of each permit is the Environmental Management Plan (EMP), which is an expansive environmental monitoring program that outlines the processes and procedures Mosaic must implement to ensure that groundwater withdrawals do not result in adverse impacts to existing legal users or environmental features adjacent to and in areas surrounding the mine project boundaries. The EMP is designed to accomplish four overall tasks:

1. Prevention – identify the measures that will be used to prevent adverse impacts to protected environmental features, water resources, off-site land uses and existing legal users.
2. Monitoring – define the pre-mining, during mining, and post-mining monitoring necessary to ensure that potential concerns are identified before adverse impacts result.
3. Corrective Action – provide a framework and approach to undertake specified corrective actions to address identified problems.
4. Reporting – define the reporting requirements.

Mosaic complies with these requirements and is taking a proactive approach so that groundwater flows are maintained in the areas of active mine activities. As demonstrated through this program, regular monitoring is already a component of Mosaic's daily mine operations, and the EMP provides a framework that identifies issues and are remediated and/or mitigated such that adverse impacts to adjacent environmental features and hydrologic conditions do not occur.

17.6.4 Volumes and Characteristics of Water Discharges

All active mining, beneficiation plant, mine infrastructure, and reclamation areas are encircled by perimeter berms and ditches to preclude non-point source discharges.

Containment of rainfall and run-off results in the need to discharge water when the volume of water within the active mining and reclamation areas exceeds the mine's recirculation system capacity.

Discharge volumes are generally correlated to antecedent rainfall levels and vary significantly in the short term and long term. For example, no discharges have occurred when central Florida was in an extended drought. In contrast to the drought years, during years when central Florida experienced chronic excessive rainfall and hurricanes, discharges were nearly continuous and discharge volumes were correspondingly larger.

As shown on the mine process flow diagram (Figure 17-1) all production-related water and collected storm water are contained within the mine water recirculation system. The recirculation system consists of pumps, pipelines, ditches and CSAs and is designed to store and recycle water to supply the mine's needs. Discharges generally occur only when the system is full and cannot store additional rainfall or in advance of a major predicted weather event (i.e., hurricane).

The CSAs are multi-functional in that these areas are used to backfill mined lands with clay residuals; provide much of the storage capacity for the mine recirculation system; and serve as the pre-treatment facility for water to be discharged. Specifically, the settling areas provide treatment defined as "sedimentation" by FDEP.

Domestic Wastewater

The domestic wastewater produced onsite at each beneficiation plant or supporting buildings/offices is either disposed of through a permitted septic system or treated through the use of an onsite package plant. Effluent from a package plant is discharged through an approved NPDES outfall into the mine recirculation system.

Internal Water Management Facilities

The internal water management facilities typically consist of:

- Perimeter ditch and berm systems.
- Stormwater sumps (surge ponds), pumps and pipelines.
- The mine water recirculation system.
- Final clarification ponds and/or sand filters and NPDES outfalls.
- CSAs.
- Mined areas (pits).
- Mine water ditches and water storage ponds.

Upon completion of reclamation and mitigation, the internal water management facilities are removed.

Water Control Structures

Various water control structures have been and will be installed, that include the retaining berms around the boundaries of active mining and reclamation areas, outlet structures for CSA dams, NPDES outfalls, etc. Upon completion of reclamation and mitigation, all water control structures have been and will be removed.

17.7 Reclamation, Mitigation and Closure

Mosaic is subject to state and county requirements to reclaim each acre disturbed by mining operations. In certain circumstances, financial responsibility must be provided to backstop those commitments. Mosaic satisfies these financial responsibilities using mechanisms such as surety bonds, audited financial statements, insurance certificates, financial tests and corporate guarantees. Financial responsibility mechanisms are updated and submitted to the appropriate agency as required. Additionally, for certain counties, Mosaic's financial responsibility is reviewed and approved by the Board of County Commissioners on an annual basis. Mosaic is currently in compliance with these reclamation financial responsibilities.

Mitigation (Section 17.7.2) is required by the 404 Permits and the WRP/ERPs issued to authorize disturbance of waters of the state and the United States. Financial responsibility must be provided commensurate with funding to complete construction and monitoring of the mitigation sites. Once implemented, the conservation easements covering most mitigation sites include long-term management plans and financial responsibility to implement those plans.

Closure of the beneficiation plant and associated facilities (see Section 17.7.3), including infrastructure corridors, is regulated by the reclamation obligation according to each site's approved post-reclamation land use included in the CRP.

17.7.1 Reclamation

According to 62C-16.0051(12)(b)4, F.A.C. "Reclamation and restoration shall be completed within two (2) years of the actual completion of mining operations, exclusive of the required growing season to ensure the growth of vegetation, except that where sand-clay-mix or other innovative technologies are used, the Department may specify a later date for completion. The required completion date may vary within a reclamation parcel, depending upon the specific type of mining operation conducted." Due to this reclamation timing requirement, reclamation is completed as mining is ongoing. Annual reports for each active and idle mine site are submitted to the FDEP each year detailing the number of acres mined or disturbed and the amount of land reclaimed within that footprint. The reclaimed acres are provided in three categories: contoured to final grade, revegetated, and released. These detailed reports are public information and can be found on the FDEP website. Additionally, each county requires a separate annual report detailing county requirements.

Florida Requirements

Rule 62C-16.0075, F.A.C., establishes minimum reclamation requirements in terms of the percent of mined land that must be reclaimed during each five-year interval following commencement of mining operations. If a mine operator fails to comply with this "rate of reclamation rule", the operator must post a financial security to cover the cost of reclaiming "delinquent acres" and remain in effect until the delinquent acres have been reclaimed. Mosaic is in compliance with the rate of reclamation rule at all active mine sites in Florida, therefore, is not subject to the reclamation financial responsibility requirements.

Polk County Requirements

Chapter 10, Article III, in the Polk County Code of Ordinances is known as the Polk County Mining Ordinance (Ordinance). The Ordinance imposes no other requirements beyond those established by Chapter 62C-16, F.A.C. at the state level.

Hardee County Requirements

Section 3.14.02 of the Hardee County Land Development Code (LDC) establishes the Hardee County Mining Regulations. The regulations prescribe requirements for preparation and approval of a Master Mine and Reclamation Plan (MMRP) for each mine in the county: standards and minimum schedules for the reclamation of mined and disturbed lands; fee schedules; and financial responsibility requirements. The financial responsibility requirements are US$15,000 for each acre of land excavated but not yet reclaimed and $1,000 for each acre-ft. of the maximum above-grade volume of the largest CSA. The annual review fee is US$7.00 per acre of mined or disturbed land not yet reclaimed, and the annual monitoring fee is $1.20 per acre of mined land.

Manatee County

Manatee County Ordinance No. 04-39 is codified as Chapter 2-20 in the Code of Ordinances and is titled The Manatee County Phosphate Mining Code (Code). Generally, the Code imposes requirements to obtain approval of a life-of-mine Master Mining Plan (MMP), that is implemented and governed by issuance of a sequence of five-year operating permits.

The MMP must include a reclamation plan that meets the requirements of the applicable Manatee County Phosphate Mining Reclamation Manual. Reclamation through initial planting must be completed no later than five years after cessation of mining extraction on each specific reclamation unit, with the exception of CSAs.

Section 2-22-42 establishes the following financial responsibility mechanisms and amounts:

- Insurance
  - Personal injury coverage = US$5 M;
  - Property damage = $5 M; and
  - CSA environmental damage = $25 M or $1,000 for each acre-ft. of above-grade storage in the largest CSA.

- Unqualified certified financial statements demonstrating the ability to fund liabilities of not less than:
  - $3,000 per acre of land to be disturbed during the operating permit term; and
  - $4,000 for each acre-foot of above-grade storage in the largest existing or proposed CSA.
- General Surety Bond equal to $500 for each acre to be disturbed during the operating permit term.
- Reclamation bond in an amount equal to 110% of the cost to reclaim each acre of land to be disturbed during the upcoming year plus all land previously disturbed but not yet released by the county as estimated by a registered professional engineer, as well as the cost to physically demolish and dispose of all mine infrastructure not needed after mining and reclamation are complete.

Hillsborough County

Part 8.02.00 in the LDC establishes the Hillsborough County Phosphate Mining Regulations. The regulations define the requirements for approval of a life-of-mine operating permit; annual reports; standards for operations; standards and minimum schedules for reclamation; fee schedules; and financial responsibility requirements. Generally, physical reclamation work must be completed within four years of completion of mining in each mining unit or use as a CSA or other mine infrastructure. Financial responsibility is calculated annually in the annual report for each acre to be disturbed during the upcoming year plus all land disturbed but not yet released at a rate of $6,113 per acre, which is then escalated from base year 2020 by applying the Construction Cost Index. CSA liability is $1,000 for each acre-ft. of above-grade storage in the largest active CSA. Evidence of financial responsibility may be furnished by current financial statements, corporate guarantees, letters of credit, insurance, surety bonds or other financial instruments acceptable to the county.

17.7.2 Mitigation

Mitigation is required to offset impacts to waters of the state and the United States with specific requirements defined in conditions in the 404 Permits and WRP and ERPs that authorize mining. Mitigation credits are generated by: (a) preserving high quality wetlands and streams; (b) enhancing lower quality wetlands and streams avoided by mining operations; (c) creating wetlands and streams on mined land during the reclamation process; and/or (d) purchasing credits from a mitigation bank. Mitigation is sufficient if the sum of the credits from the above-listed actions exceeds the loss of functional value resulting from wetland and stream disturbance associated with mining.

The mitigation plan for each site is outlined in the 404, WRP or ERP Permits. Mosaic provides annual reports to the agencies with the status of each site's mitigation obligation.

Information regarding conservation easements that have been granted or committed to as part of these mitigation plans can be found in Section 17.3.3.

be found in Section 17.[illegible].

17.7.3 Closure Requirements

The chemical storage tanks at a beneficiation plant must be closed once operation of the plant ceases. There are no financial responsibility obligations associated with the storage tanks.

The financial liabilities associated with current/future reclamation obligations and closure/demolition of the beneficiation plant and associated facilities are discussed in Section 17.7.4.

17.7.4 Obligations Upon Asset Retirement

Mosaic's financial liabilities associated with active phosphate facilities consist of current and future reclamation obligations, beneficiation plant closure/demolition, and mitigation obligations. Current liabilities are "net" of reclamation/mitigation work already completed.

Life of Mine Estimated Reclamation Costs

Mosaic's current estimate for the 2023 LOM plan reclamation costs for Four Corners, Wingate and South Fort Meade is $301,693,483.

Beneficiation Plant Closure/Demolition

Mosaic retained Burns & McDonnell Engineering Co., Inc. to develop site closure plans for each beneficiation plant. A +/- 25% estimate of total closure is included in each site closure plan. The costs include decommissioning costs based on the demolition of the site in mobilization, as well as credits for salvage and recycling. An initial estimate of additional required environmental assessment costs is also included.

The costs listed below have been consolidated and include only the active mining facilities (i.e., Four Corners, South Fort Meade and Wingate). The following costs are based on the reports prepared by Burns & McDonnell Engineering Co., Inc. during 2021.

Demolition Activities

It is estimated that closure cost to complete the facility demolition activities for all existing active mining facilities (including facility buildings and structures, infrastructure and ACM) is $12,280,600. The anticipated 25% range of the estimate was determined to be $9,210,525 to $15,350,875. Environmental costs are provided for the asbestos abatement and decommissioning of residual universal and regulated waste.

Scrap Value

The total estimated value of the scrap onsite for all existing active mining facilities is $6,226,800. This includes the process structures.

Net Total Estimate

The net total estimate (demolition cost – scrap value) for site closure for all existing active mining facilities ranges from $2,983,725 to $9,124,075.

Mitigation Liabilities

Mosaic must provide financial responsibility to ensure the mitigation work required in the form of wetland and stream creation and enhancement is completed. Annually, Mosaic submits to the FDEP the financial assurance documents as required by the WRP/ERP Permit and F.A.C. Rule 62-312.390 utilizing the guarantee specified in subpart H of 40 CFR and/or section 373.414(19)(b)7, F.S.

17.8 Permits and Registrations

Mosaic has received all necessary governmental permits and approvals to authorize the mining operations currently being conducted. These approvals can be categorized as discretionary development approvals, operating permits, and licenses/registrations. In addition, a Conceptual Reclamation Plan (CRP) has been approved by the FDEP for each site; however, the CRP does not regulate or authorize mining.

Mosaic maintains an extensive database to track each permit and specific condition compliance. Permits for the active and idle sites are renewed as necessary.

For future mineral resource areas, such as DeSoto and Pioneer, permits must be obtained from federal, state and local agencies before any mining activities commence.

17.8.1 Development Approvals

The federal approval for each facility consists of a 404 Permit, which includes a certification of conformance with the Endangered Species Act (i.e., USFWS biological opinions), the National Historic Preservation Act, and NEPA. The Florida approval consists of a WRP or an ERP, that regulate surface water and wetland resources and represents the Section 401 CWA and Section 307 Coastal Zone Management Act state certifications. The local approval consists of DRI or county LDC and MMRP approvals.

As noted above, each of these approvals do not require periodic renewals, unlike the operating permits described below. However, most have 5-year compliance review/re-opener conditions. To date, 5-year reviews have found Mosaic to be in compliance with the conditions of approval and have not required any material changes in operations.

17.8.2 Operating Permits

Operating permits are issued by FDEP, the Florida Department of Health, the Florida Fish and Wildlife Conservation Commission, the SWFWMD and certain counties. The operating permits authorize activities or actions common to many industries, landowners and municipalities in Florida. All have defined terms and renewal requirements. Renewal of these types of operating permits is likely throughout the life of the facility, however, it is at the discretion of the authorizing agency. Several have mining-specific requirements or authorizations as described below.

The FDEP-issued NPDES permit (also referred to as the Industrial Wastewater Facility Permit), not only represents the federal CWA Section 402 authorization, but also authorizes and regulates discharges to the surficial groundwater aquifer. In addition, the permit authorizes the construction, operation and abandonment of above-grade impoundments referred to as CSAs.

The SWFWMD integrated water use permit (IWUP) authorizes the withdrawal of groundwater from underground aquifers through permitted wells to provide potable and production-water supplies. One IWUP addresses all of the Mosaic's active mining operations. A separate water use permit (WUP) was issued for the South Pasture facility. The IWUP and the South Pasture WUP also regulate mine dewatering to ensure wetlands and offsite properties are not adversely affected as described above.

Certain operating permits include conditions of approval that impose monitoring and/or reporting requirements as described above. All of the operating permits have been issued based on agency findings that the proposed action meets the criteria for permit issuance or renewal. Continued renewals of the operating permits in the future is likely.

17.8.3 Registrations and Licenses

Registrations and licenses are, in essence, perfunctory approvals that seldom include discretionary decisions by agency staff. These are for facilities common to many industries (e.g., petroleum storage tanks).

17.8.4 Bureau of Land Management Leases

Mineral rights beneath the acreage shown in the table below (Table 17-5) were reserved by the United States. Prior to mining these areas, federal leases were obtained or will be obtained from the U.S. Department of Interior, Bureau of Land Management (BLM). Mosaic is currently in compliance with this requirement.

Table 17-5: Bureau of Land Management Lease Summary

Location	Acres Total	Acres Mined	Acres Remaining
Four Corners Facility	111.4	49.3	62.1
South Fort Meade Facility	916.6	773.4	143.2
South Pasture Property	41.0	0.0	41.0
DeSoto Property	39.1	0.0	39.1

17.9 Social Considerations, Plans, Negotiations and Agreements

The following sub-sections discuss some of the social considerations, plans, negotiations and agreements that Mosaic currently maintains in relation to mining.

17.9.1 Consideration of the Human Environment

Consideration of the potential effects of each mine site on the human environment were an integral component of the analyses conducted by the agencies when conducting NEPA reviews. Evaluations under county standards also considered potential impacts to the human environment (Table 17-6).

Table 17-6: Human Environment Elements Considered

	NEPA	DRI/County	State
Historic, cultural and scenic	x	x	x
Property ownership	x	x	NA
Safety of impoundment structures	x	x	x
Water supply and conservation	x	x	x
Energy conservation and development	x	NA	NA
Economics	x	x	NA

Economics	x	x	NA
Public health and safety	x	x	x
Aesthetics	x	NA	NA
Demographics/environmental justice	x	NA	NA
Transportation	x	x	NA
Government revenue generation	NA	x	NA
Land use compatibility	NA	x	NA

Issuance of the 404 Permits and county approvals include findings by the agencies that the human environment was considered, and potential impacts were found to be insignificant. Florida regulatory agencies also applied certain human environment criteria which must be met under Florida Law as a pre-condition for permit issuance. These state permits include WUP, NPDES, and ERP permits.

17.9.2 Environmental, Social and Governance (ESG) Program

The Mosaic Company has developed and is implementing a company-wide ESG program. Specific quantifiable targets/goals have been adopted for achievement by 2025. The 2025 environmental goals applicable to the mine sites include:

- Eliminate significant environmental incidents;
- Reduce greenhouse gas emissions by 20% per tonne of product; and
- Reduce freshwater use by 20% per tonne of product.

17.9.3 Investment in the Environment

Mosaic supports organizations that work in watershed restoration, habitat conservation and nutrient stewardship. These programs, respectively, include shoreline restoration and oyster reef installations; improved land management practices and wildlife protection; and 4R nutrient stewardship, that is best management practices for fertilizer application, minimizing field runoff and improving farmer yields. In 2021, Mosaic invested in the following areas: Habitat Conservation $641,488, Nutrient Stewardship $170,000, Watershed Restoration $81,462 for a total of $892,950.

17.9.4 Citizen Advisory Panels

Mosaic has organized and implemented a citizen advisory panel (CAP) program in each county where mining is occurring. The CAPs consist of a diverse group of citizens from each county in terms of occupations, demographics, history, etc. A key role of each CAP is to help Mosaic identify and address community impact issues.

17.9.5 Sierra Club Settlement Agreement

The Sierra Club litigated issuance of the 404 Permit that authorizes SFM Hardee County Extension (SFM-HC). Ultimately, Mosaic and the Sierra Club entered into a settlement agreement. The key provisions of the agreement were:

- Avoidance, enhancement and/or CE protection of additional wetlands on SFM-HC;
- Additional CE protection of land adjacent to SFM-HC;
- Use of recharge wells within a certain mining area;
- Additional acreage of reclaimed wetland in the reclamation plan;
- Development and implementation of the Peace River Monitoring Plan (PRMP); and
- Donation and placement of lands in perpetual conservation.

Mosaic is in compliance with the terms of this agreement and submits an annual report to the Sierra Club on the results of the PRMP.

17.9.6 Peace River Monitoring Plan (PRMP)

One component of Mosaic's overall monitoring program is the PRMP. This monitoring is in addition to the monitoring that is required by Mosaic's approved permits. The PRMP consists of monitoring water quality and stream biology at locations within the upper, middle and lower reaches of the river. This monitoring data complements monitoring conducted by government agencies in terms of documenting the chemical and biological conditions in the Peace River and one of its major tributaries.

17.9.7 Horse Creek Stewardship Plan (HCSP)

In collaboration with Peace River Manasota Regional Water Supply Authority (PRMRWSA) since 2003, the HCSP is a long-term monthly monitoring agreement of water quality and quantity at several locations within Horse Creek. Horse Creek is a major tributary to the Peace River. The program provides a protocol for collection of information on the physical, chemical and biological characteristics of Horse Creek during Mosaic's mining activities in the watershed. This monitoring is in addition to the monitoring that is required by Mosaic's approved permits.

17.9.8 Southwest Florida Water Management District Agreement

Mosaic entered into an agreement with the SWFWMD for public reporting purposes of surface water stage elevation data. Mosaic installed and continues to operate, maintain and monitor stage level recording devices at eight surface water stations (referred to as "SCADA" Surface Water Level Monitoring). Data is uploaded monthly to the SWFWMD system. Mosaic may terminate the agreement without cause upon 30 days' written notice.

17.9.9 United States Geological Survey (USGS) Agreement

Mosaic entered into an agreement that requires the USGS to provide continuous water-level data for three gauges on Little Charlie Creek in Hardee County adjacent to the South Fort Meade mine. USGS owns, operates and maintains all three gauges. The agreement may be terminated by either party on 30 days' written notice.

17.9.10 Hardee County Economic Development

Mosaic has entered into Local Development Agreements (LDAs) with Hardee County to implement Goal E5 of the county's Comprehensive Plan. The LDA provides resources to achieve economic diversity and maximize sustainability on reclaimed

lands through the initiatives advanced by the county's Economic Development Council/Industrial Development Authority. Mosaic presented a status summary on April 1, 2021 to the Hardee County Board of County Commissioners and is in compliance with the terms of the LDAs.

17.9.11 Manatee County

For the promotion and benefit of the health, safety and welfare of the citizens of Manatee County, Mosaic has agreed to additional conditions in certain Manatee County approvals/operating permits. These conditions are often referred to as "overriding public benefit". Mosaic has fulfilled the obligations in those agreements with the exception of the ongoing/future efforts related to the Wingate East permit, including the agreement for Mosaic to pay a portion of the cost to replace the Duette Bridge in Manatee County. Mosaic's proportionate share for the bridge replacement is approximately $384,000. Mosaic has executed a surety bond to ensure payment of its proportionate share of the bridge replacement costs until Manatee County replaces the Duette Bridge.

17.10 Qualified Person's Opinion on Adequacy of Current Plans to Address Issues

Based on information referenced in Section 17.1, 17.2, 17.3, 17.8, and 17.9, it is the QP's (Bethany Niec) opinion that Mosaic has monitoring plans in place to evaluate environmental performance to standards applicable to the active phosphate facilities as prescribed by applicable law and permit conditions.

Based on the information referenced in Section 17.4, 17.5, 17.6, and 17.7, it is the QP's (Scott Wuitschick) opinion is that Mosaic has monitoring plans that are designed to minimize the risks of significant environmental incidents in the near future related to the operation of the active phosphate facilities.

18.0 Capital and Operating Costs

18.1 Capital Cost Estimates

18.1.1 Basis of Estimate

The basis to estimate capital expenditures for the Four Corners, South Fort Meade and Wingate facilities is as follows:

- The target accuracy level is at a pre-feasibility level, -25% to +25%.
- The estimate was prepared and reported in USD currency.
- The estimates have been compiled and organized annually with cost by category.
- Mine capital costs include only capital expenditures related to the extraction of the mineral reserves. Expenditures are classified as mine capital if they relate to physical assets, exceed US$10,000 or have a minimum expected useful life of two years.
- Expansion costs consist of land/reserve acquisitions, field-related mining infrastructure and equipment additions. These costs are based on currently available engineering estimates.
- Sustaining – Geotech/CSA costs are derived from the mining plan and estimated from unit cost rates that have been established from historical costs.
- Sustaining – Other. 1) Dragline and dredge sustaining turnaround timing is based on maintenance schedules and costs are estimated by historical analysis. 2) Field mining (pipe/pumping systems) required to move mined mineral reserves (matrix slurry form) to site beneficiation plant facilities. Costs are based on historical spending in these areas. 3) Electrical infrastructure such as power lines, substations, transformers and others required to sustain operations are estimated from historical spending levels. 4) Plant processing and material handling/loading costs are derived from anticipated production levels and based on historical spending.
- Capital cost forecasts are based on planned mine development and construction needs, mobile equipment re-build/replacement schedules and fixed asset replacement and refurbishment schedules.
- The estimate is inclusive of project indirect costs and owner costs as these are captured in the historical cost analysis used to prepare the estimate.
- State and county sales tax are included.
- Freight and installation are included.
- Contingency has not been added.

18.1.2 Exclusions for the Capital Cost Estimate

The following has not been included in this capital cost estimate:

- Schedule delays and associated costs, such as those caused by unexpected conditions and labor disputes.
- Inflation and escalation.
- Capital expenditures related to fire, flood and severe weather events (hurricanes, tornados).

General and administrative costs are not allocated to capital projects at Mosaic and have not been included in this cost estimate.

18.1.3 Capital Cost Estimate

The capital cost estimates for the 2023 LOM plan based on mineral reserves are listed by category in Table 18-1. The total capital for the 2023 LOM plan (2023 to 2035) is estimated at US$1,616 M. Historical costs from 2018 to 2021 and a forecast for 2022 are included.

Table 18-1: Historical and LOM Plan Capital (M US$)

Year	Status	Expansion M US$	Sustaining-Geotech / CSAs M US$	Sustaining-Other M US$	Total Capex M US$
2018	Actual	26.4	32.1	59.9	118.4
2019	Actual	107.8	20.5	52.2	180.5

2020	Actual	82.5	47.5	47.3	177.3
2021	Actual	139.5	57.3	74.2	270.9
2022	Fcast.	71.7	117.8	52.0	241.5
2023	Plan	181.4	120.7	49.3	351.4
2024	Plan	269.9	98.1	62.6	430.6
2025	Plan	116.0	51.0	62.8	229.9
2026	Plan	35.6	51.8	49.4	136.7
2027	Plan	15.3	80.6	54.0	149.9
2028 to 2035	Plan	0.0	60.7	257.0	317.6
2023 LOM	**Plan**	**618.2**	**462.8**	**535.1**	**1,616.1**

18.2 Operating Cost Estimates

18.2.1 Basis of Estimate

The basis of estimate used for the mining operating costs are as follows:

- The estimate was prepared in USD currency.
- Operating costs do not include inflation and are in today's dollars over the three active mining phosphate facilities (South Fort Meade, Four Corners and Wingate) LOM plan.
- Historical costs are used as the basis for mining operating forecasts and adjustments are made by using a variable cost per tonne. The accuracy of the operating costs is within the required parameters for a pre-feasibility level estimate, -25% to +25%.
- Mosaic and contractor labor headcount complement are assumed relatively constant and fixed in total for the LOM plan.
- Other operating costs consist of functional, administrative and plant costs. These costs are assumed to remain relatively constant compared to the 2022 forecast.
- Depreciation, depletion and accretion are excluded from the operating cost estimates listed below. Section 18.1 outlines the expected future capital expenditures and outlay of cashflows over the 2023 LOM plan.
- Freight charges are excluded from the operating costs and are shown net of the sales price.

18.2.2 Mine Operating Costs

Historical costs are used as the basis for mine operating cost forecasts, that are estimated using a long-term cost model. This model accounts for the impact of varying production rates and labor complement.

Mine operating costs are organized in the following categories:

- Mining cash costs include mining, beneficiation plant, maintenance and direct overhead costs but exclude the clay settling areas, sustaining capital, Geotech costs, and expansion development costs.
- Other Operating Costs comprise central and functional overhead allocated costs. These costs consist of services related to warehousing, purchasing, accounting, information technology, environmental and safety, mechanical integrity, asset reliability, and quality control.
- Royalties and other Government levies or interests include severance taxes, royalties, and excludes income taxes.

The total operating costs supporting the 2023 LOM plan are estimated at US$5,285.3 M (Table 18-2).

Table 18-2: Historical and LOM Plan Cash Costs

Year	Status	Production M tonnes	Mining Cash Costs M US$	Other Operating Costs M US$	Royalties and Other Government Levies or Interests M US$	Total Site Cash Costs M US$
2018	Actual	12.8	372.4	43.9	33.9	450.2
2019	Actual	12.2	388.8	45.1	37.6	471.6
2020	Actual	12.8	377.2	47.5	36.5	461.2
2021	Actual	11.1	359.7	50.2	27.0	436.8
2022	Fcast.	10.6	388.9	42.7	24.5	456.1
2023	Plan	11.7	397.5	49.6	24.8	471.9
2024	Plan	11.8	397.6	47.6	23.3	468.6
2025	Plan	11.7	385.0	47.1	22.5	454.6
2026	Plan	11.4	396.1	49.8	20.7	466.6
2027	Plan	11.7	399.2	51.8	21.3	472.3
2028 to 2035	Plan	67.2	2,489	340.3	122.2	2,951.3
2023 LOM	**Plan**	**125.5**	**4,464.1**	**586.3**	**234.8**	**5,285.3**

2023 LOM	Plan	125.5	4,464.1	360.5	234.8	5,265.5

19.0 Economic Analysis

19.1 Methodology Used

The financial model that supports the mineral reserve and mineral resource declarations is a standalone model that calculates annual cash flows based on scheduled mined production, assumed processing recoveries, commodity sale prices, projected operating and capital costs and estimated taxes, along with anticipated reclamation and decommissioning costs.

Mosaic defines the Internal Transfer Price (ITP) as effectively a cost. It is the forecasted cost incurred by the mining and beneficiation plant in order to produce the concentrate at a discount rate which accounts for the cost of money and a mining risk. The concentrate is then purchased at the ITP by the chemical plant, which then adds value to the concentrate by turning it into a fertilizer product.

The Gross Margin Available (GMA) takes the revenue from the sale of fertilizer products (due to processing the tonnes of fertilizer product will not equal concentrate tons) and divides this revenue by the tons of concentrate. The number produced from this calculation represents how much revenue is being generated from fertilizer adjusted to be per ton of concentrate produced. The chemical plant and downstream costs are subtracted. This makes the GMA equal to (Total Revenue – Chemical Plant Costs)/Tonnes of Concentrate. Refer to Section 16 for more details.

If GMA > ITP then the operation is profitable. The greater the difference between those two values the more profitable it is.

If the GMA < ITP, then the operation is not profitable.

The GMA and ITP do not influence each other, they are simply two values used for comparison. ITP depends on forecasted costs and GMA depends on forecasted revenue.

All monetary amounts are presented in United States dollars (US$).

19.2 Financial Model Inputs, Parameters and Assumptions

The model projects the cashflows generated from mining starting in 2023 to the end of the scheduled mineral reserves. The sum of the discounted cashflows reflects the discounted value as of December 31, 2022.

The following outlines the input, parameters and assumptions used in the financial model.

- The active mining facilities consist of Four Corners, Wingate and South Fort Meade.
- The planned production life based on mineral reserves is from 2023 to 2035.
- The LOM plan assumed ITP discussed in Section 16 and applied in the financial model.
- Total capital for the LOM plan is estimated as $1,616 M. This includes all the capital required for mine development and other sustaining capital to maintain the equipment and infrastructure and to support continuing operations from 2023 to 2035.
- The mining costs include the direct labor, materials and direct costs incurred through mine operations. Other operating costs includes the central administrative and allocated costs.
- The mines pay a severance tax to the State of Florida of approximately $1.77/tonne mined ore each year.
- Florida sales and use tax applies to taxable goods and certain taxable services acquired by the Florida phosphate facilities. The rate is approximately 7 to 7.5% in total and comprises a state and county portion.
- Property taxes are assessed by county assessors and collected by county treasurers with oversight from the Property Tax Division. Florida collects realty and tangible personal property taxes.

- Mosaic is taxed on its taxable income in the United States. It is taxed at the federal and state level. The total statutory tax rate is 22.34%, consisting of a 21% federal rate and a 1.34% state rate (net of federal benefit).
- Reclamation and closure related costs of approximately $278 M were included in the financial model. This estimate is informed from the work undertaken each year to estimate the asset retirement obligations for financial and compliance reporting purposes. The costs relating to closure of the facilities include all demolition, reclamation and decommissioning costs, net of the estimated salvage and scrap proceeds. Since many of the reclamation and decommissioning obligations extend well beyond the mine closure date, these cashflow obligations were discounted at the last LOM year and included in the cashflow analysis as one discounted value at the end of LOM year.
- The economic analysis is based on 100% equity financing.
- The financing and capital structure of mines were not considered in the analysis. The earnings are reduced for a notional cash income tax expense.
- The economic analysis is based on 2022 prices and future values have not been adjusted for inflation.
- The discounted cashflow analysis applies end of year discounting and uses a discount rate of 9.0%.

19.3 Economic Analysis

Table 19-1 shows the annualized cash flow for the 2023 LOM plan. The LOM ITP of $68 is calculated by setting the NPV to zero at the targeted discount rate of 9.0% which is equal to cost of capital. The ITP is significantly less than the GMA of $135.

Table 19-1: Cash Flow Analysis

SK1300 - Florida			2023	2024	2025	2026	2027	2028-2035	2023-2035 LOM
Assumptions		Internal Transfer Price	$ 68	$ 68	$ 68	$ 68	$ 68	$ 68	$ 68
		Phosphate Rock Volume (000's M Tonnes)	11,724	11,814	11,717	11,371	11,679	67,223	125,528
		Discount Rate	9.00%	9.00%	9.00%	9.00%	9.00%	9.00%	9.00%
000's $USD	Revenue	Phospate	$ 796,792	$ 802,897	$ 796,349	$ 772,778	$ 793,753	$ 4,568,654	$ 8,531,222
		Sales Revenue (FOB Mine [or Port for CMMM])	$ 796,792	$ 802,897	$ 796,349	$ 772,778	$ 793,753	$ 4,568,654	$ 8,531,222
	Costs of Production	Mining	397,501	397,608	384,983	396,075	399,232	2,488,741	4,464,140
		Other Operating Costs	49,593	47,642	47,106	49,778	51,832	340,347	586,296
		Resource Taxes, Royalties and Other Government Levies or Interests	24,796	23,347	22,495	20,705	21,268	122,234	$ 234,844
		Cash Costs of Production	$ 471,889	$ 468,597	$ 454,583	$ 466,557	$ 472,332	$ 2,951,321	$ 5,285,281
	Income Taxes	Income Tax	114,348	117,134	118,410	108,073	113,202	604,837	1,176,004

Income Taxes	Income Tax	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
ARO	Reclamation and Closure	-	1,739	6,041	9,001	12,522	248,522	277,826
Capital Expenditures	Capital Expenditures	351,368	430,626	229,917	136,716	149,888	317,620	$ 1,616,135
Cash Flow	Annual Net Cash Flow	$ (140,814)	$ (215,200)	$ (12,602)	$ 52,431	$ 45,808	$ 446,354	$ 175,976
Economic Viability	Net Present Value							$0

19.4 Sensitivity Analysis

A sensitivity analysis is shown in the Figure 19-1 utilizing the following factors.

- GMA
- Total operating cost
- Total capital cost

The sensitivity analysis of the 2023 LOM plan is presented in Figure 19-1.

- If the GMA were to decrease 20% from currently estimated, Florida phosphate mining will remain economically viable, with a minimum ITP needed to achieve zero NPV (a rate of return equal to Mosaic's cost of capital) still below the lower GMA.
- If the operating costs were to increase 20% from those currently estimated, Florida phosphate mining will remain economically viable, with a minimum ITP needed to achieve zero NPV (a rate of return equal to Mosaic's cost of capital) well below the GMA.
- The capital spending sensitivity assumes a 20% change to annual capital spending requirements each year. If the capital costs were to increase 20% from those currently estimated, Florida phosphate mining will remain economically viable, with a minimum ITP needed to achieve zero NPV (a rate of return equal to Mosaic's cost of capital) well below the GMA.

Figure 19-1: Sensitivity Results on ITP vs GMA

Figure 19-1: Sensitivity Results on IRR vs GMA

20.0 Adjacent Properties

No information from adjacent properties has been included in the preceding sections of this Report. All information used and included in this Report is the result of geology, engineering, mining, environmental and processing, etc. activities completed at the mines.

Properties adjacent to the mining facilities and exploration properties are owned by many individuals and other parties. These properties have a level of historical exploratory drilling already completed. This drilling is of varying quality but does provide information on the potential for additional phosphate mineralization. Mosaic has access to the majority of the drill hole information from the adjacent properties and uses this to make decisions on future property acquisitions.

There is no publicly disclosed information or mineral resource estimates from the owners of the adjacent properties.

Table 20-1 provides a Mosaic-generated order of magnitude range estimate of the exploration potential on the adjacent properties to the Florida phosphate mining facilities and properties.

Table 20-1: Order of Magnitude Exploration Potential Estimate on Adjacent Properties

Estimated Number of Owners	Approximate Acreage (Acres)	Tonnage Estimate (M tonnes)
500 to 1,500	10,000 to 15,000	50 to 150 M

21.0 Other Relevant Data and Information

All data relevant to the estimation of the Florida phosphate mining mineral resources and mineral reserves has been included in the sections of this Report.

22.0 Interpretation and Conclusions

22.1 Mineral Resources

The following is a summary of the key interpretations and conclusions relating to the mineral resource estimates:

- All of the land included in mineral resource estimation is controlled by Mosaic. Any outstanding mineral rights without lease agreements are not significant and do not represent a risk to mineral resource estimate.
- The geology team has a strong understanding of lithology, stratigraphy and phosphate mineralization. The available data is appropriate to support the geological interpretation for this style of mineralization.
- The geologic and deposit related knowledge has been considered and applied in support of exploration, interpretation and mineral resource estimation processes used by the Florida phosphate geology team.
- Exploration data collection methods follow industry standard practices that were in place at the time of the various

past and current exploration campaigns.

- Data that does not meet the standards for reliability are removed from the mineral resource estimation process.
- The validated geological information is considered reliable, representative and is fit for purpose in developing a geological model and for mineral resource estimates, as well as for use in other modifying factors studies including mine design, scheduling and mineral reserve estimation.
- The appropriate internal data verification and data validation work on historical and recent exploration data to ensure the geological information is reliable, representative and free of material errors or omissions has been completed.
- The sample preparation, security and analytical procedures that have been utilized at Florida phosphate mining facilities are suitable to support mineral resource and mineral reserve estimation.
- The analytical procedures, data quality and quantity are aligned with industry standards and practice. The data received from the A-Lab and the QA/QC processes validating is within industry standards to drive and support conclusions regarding the actual processes.
- The current mining processes and methods employed at the Florida phosphate mines support the establishment of reasonable prospects for economic extraction for the Florida phosphates mineral resource estimates.
- The active facilities have power and water infrastructure and staffing plans needed to operate efficiently. Each facility is readily accessible by municipal roads and private rail service.
- The mature nature of Florida phosphate mining and the good understanding of the continuity of the phosphate mineralization, supports the establishment of reasonable prospects for economic extraction for the Florida phosphates mineral resource estimates.
- Mosaic's active phosphate facilities are well established and have been producing for over 40 years. There are no issues that require further work relating to relevant technical and economic factors that are likely to influence the prospect of economic extraction.
- The classification of mineral resources into confidence classes measured, indicated and inferred considered geological confidence, uncertainty and the distribution of the geological and mining data.

Risks or uncertainties associated with the Florida phosphate mining mineral resource estimates are:

- There are a number of uncertainties (Section 11.9) that exist at the mines that could impact the mineral resource estimates. They are considered as areas of future mineral resource estimation improvements.
- Historically, there has not been external third-party data verification and mineral resource estimation audits completed.
- Drilling density variation is observed occasionally through the drilling programs. This adds some uncertainty to tonnage estimates.

- As enhancements are pursued to allow the mining of higher impurity or heavier clay material, the mineral resource estimates may change.

22.2 Mineral Reserves

The following is a summary of the key interpretations and conclusions relating to the mineral reserve estimates and supporting modifying factors.

- The mineralization, mining, processing and environmental aspects of the facilities are very well understood. The operational and technical knowledge has been appropriately used in the development of the LOM plan and mineral reserve estimates.
- Land included in the LOM plans is controlled. Any outstanding mineral rights without lease agreements are not significant and do not represent a risk to the LOM plan.
- The reconciliation process used to develop mine modifying factors is adequate to produce LOM plans.
- The modeling creation procedure is sufficient to generate accurate LOM plan.
- The mines have appropriate power and water infrastructure and are staffed with ample personnel needed to operate efficiently. The facilities are readily accessible by municipal roads and private rail service.
- Years of historical operational data and observations have been adequately documented.
- The mineral reserve estimate has been prepared to comply with all disclosure standards for mineral reserves under S-K 1300 reporting requirements.
- The mineral reserve estimates are based on a 2021 LOM plan, employing proven industry and practical methods of mining applicable to the type of mineralization and are demonstrated to be economic through a supporting economic evaluation.
- The facilities have the appropriate equipment for mining and have identified and scheduled the capital spending required to provide the required equipment fleet size and capacity, and labor staffing to support the LOM plan.
- The mining and material transport processes have been shown to be effective from a cost, reliability and production standpoint.
- Beneficiation recovery relies upon standardized metallurgical and analytical testing. The metallurgical and analytical testing and historical data are adequate for the estimation of recovery factors supporting the mineral reserves. The metallurgical test work is performed on samples that are considered to be representative of the mineralization styles and mineralogy. The data quality and quantity are aligned with industry standards.

beneficiation recovery factors are based on appropriate metallurgical test work and confirmed with production data.

- There is sufficient infrastructure in place to support the mining and processing activities at the mines.
- The management of all environmental aspects, permitting and social considerations at all Mosaic facilities is guided by Mosaic's Environmental, Health and Safety Policy, the Mosaic Management System Program and Procedures, and current legal and regulatory requirements. Mosaic understands the sustainability of their business and communities are indelibly linked and strives to be a thoughtful and engaged neighbor who invests carefully and generously and seeks long-term partnerships with organizations that are making a difference.
- Mosaic has monitoring plans in place to evaluate the environmental performance to standards as prescribed by applicable law and permit conditions.
- Closure plans are completed, representing current land disturbance conditions and anticipated land disturbance conditions at the end of the LOM plan.
- Beneficiation recovery factors estimated are based on appropriate metallurgical test work and confirmed with production data.

- The economic results and sensitivity analysis for the mineral reserves indicates that the mines can withstand 20% variations in the key cash flow components.
- Future new technology and innovation may be relevant to mining operations. The technological and process efficiencies that may be achieved have not been factored into the LOM and economic assessments. The benefit of achieving these targets along with the operational efficiencies that will be enabled by new technologies in the years that follow, create potential for significant upside to the cashflows presented.

Risks or uncertainties associated with the Florida phosphate mining mineral reserve estimates are:

- There are a number of uncertainties that exist at mines that could impact the mineral reserve estimates. They are considered as areas of future mineral reserve estimation improvements.
- The current reconciliation process limits comparison to the lithologic units that pass mineability criteria. When unmineable units are considered, the mineral reserve estimate could change.
- A more robust design and timing software that considers the complexity of the mineralization and more complex mining conditions, could change the mineral reserve estimate.
- There is a risk and opportunity associated with the variation of pricing on product sale prices and the prices of operational and capital materials and services. The sensitivity analysis is provided to help understand the impact that this risk could have on net present value.
- Over the lengthy time span there is risk that the amount of annually invested capital required to sustain the plant could fluctuate above the levels estimated.

23.0 Recommendations

Based on current project status, the QP's are not recommending additional work at this time. However, the following recommendations have been identified to further enhance internal processes and planning.

- Mosaic will continue to investigate and consider new innovations in phosphate mining and processing technology.
- A thorough production reconciliation process will be considered to further improve and support the mineral resource and mineral reserve estimates. Sample and measuring points will be revisited and assessed.
- The current central Florida exploration plan will be further refined to better define future opportunities for mineral resource and mineral reserve expansion.
- Mosaic will consider increasing the drilling density in the indicated and inferred mineral resource areas.
- Investigate new technology to improve the efficiency of core sample processing and sample tracking.
- A more robust modeling software for mineral resource estimates will be considered.
- Investigate the use of optimization processes for improving mineral resource limits.
- The process of acquiring additional land adjacent to the operating mines should continue as this adds mineral resources and mineral reserves to the LOM plan.
- More samplers at the beneficiation plants would help monitor the flotation performance for each circuit.
- Completion of plant step tests are recommended to evaluate changes in the minerology or verify correct setpoints when draglines have moved to a new area.

24.0 References

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25.0 Reliance on Information Provided by the Registrant

Table 25-1 outlines the information provided from the Registrant (Mosaic) for use by the QPs in the writing of this Report.

Table 25-1: Information Provided by the Registrant

Brian Ball	16. Market Studies	Marketing information including commodity price and exchange rates
Brian Ball	18.Capital and Operating Costs 19. Economic Analysis	Royalties and other accommodations; taxes and other governmental factors; mine closure costs