Bureau of Land Management



Amarillo Field Office
Helium Operations
Statistical Report
for

November - 2020



Distribution:

Fluid Minerals Group Manager, Washington Office

NMSO, New Mexico State Director

NMSO, Associate State Director

NMSO, Petroleum Engineer

Field Manager, Amarillo Field Office

Assistant Field Managers (3)

Team Leaders

- -Federal Leased Lands
- -Resources Evaluation & Gas Analysis
- -Division Of Helium Operations, -Engineering and Technical Support

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Compiled by: David Reeves Amarillo, Texas Issued: March 4, 2022

"Please Note: Data in this report is accurate as of print date; however all data is subject to change."

Approved for Distribution: Samuel R. M. Burton Date: March 4, 2022

Table 1 - Summary of Helium Operations

November - 2020

Helium Enrichment Unit Operations Gas Processed	Month Gross Volume	Month Net Helium	Average Percent	Gross FYTD	Net FYTD
Measured Plant Feed (Mcf*)	436,937	57,123	13.07%	874,034	112,214
Helium Product (Mcf*)	82,616	58,629	70.97%	161,753	114,248
Residue Natural Gas (Mcf*)	241,638	0	00.00%	456,585	0

^{*} Volumes in Mcf at 14.65 psia & 60°F

Natural Gas & Liquids Produced

Gas Processed	Month	FYTD
Natural Gas Sales (Mcf***)	237,717	449,188
NGL Sales (gallons)	89,205	156,942

^{***} Volumes in Mcf at 14.73 psia & 60°F

Bush Dome Reservoir Operations Conservation gases from all sources	Month Gross Volume	Month Net Helium	Average Percent	Gross FYTD	Net FYTD
Total Withdrawn (Mcf*)	431,504	56,114	13.00%	862,957	110,251
Crude Injection (Mcf*)	17,674	12,335	69.79%	26,326	18,437
Crude Production (Mcf*)	0	0	00.00%	0	0

^{*} Volumes in Mcf at 14.65 psia & 60°F

Storage Operations

In Kind Helium	Month	FYTD	CYTD	Cumulative
Sale Volumes Transferred (Mcf*)	32,497	39,919	205,764	4,106,977
Sale Volumes Outstanding (Mcf*)	(16,719)			

^{*} Volumes in Mcf at 14.65 psia & 60°F

Private Company Helium Storage Contracts	Month	Month		Annual
Contact Activity	Gross Volume	Net Helium	Average Percent	Helium FYTD
Crude Acquired (Mcf*)	21,379	15,088	70.57%	34,478
Crude Disposed (Mcf*)	63,044	44,783	71.03%	115,155
Net Balance (Mcf*)	(41,665)	(29,695)		(80,677)
Balance of Stored Helium End Of Month (Mcf*)		2,208,055		

^{*} Volumes in Mcf at 14.65 psia & 60°F

Revenue / Charges

Helium Storage Contracts (Charges Billed (\$)	Month	FYTD
Storage Fees Billed (\$)	\$608,377	\$1,177,298
Resource Management Fees Billed (\$)	\$263,109	\$263,109
Total Storage and RMF Collected	\$871,486	\$1,440,407

Conservation Helium - Natural Gas - Liquid Sales	(Charges Billed (\$)	Month	FYTD
In Kind Sales		\$0	\$0
Natural Gas & Liquid Sales		\$599,562	\$1,066,984

Helium Resources Evaluation	Month	FYTD	
Revenue Collected from Federal Lease Holds	\$1,914,782	\$4,000,304	
Helium Sample Collection Report for month	Received - 0	Analyzed -	9

Table 2 - Bush Dome Reservoir Operations

November - 2020

		Gross V	Vithdrawal	Net Helium	n Withdrawal	Nitr	ogen	Methane	Methane	Ethar	ne plus	Other (CO2, Ar, H2)	
		Month	Cumulative	Month	Cumulative	Month	Cumulative	Month	Cumulative	Month	Cumulative	Month	Cumulative
TOTAL		431,504	249,743,079	56,114	45,944,537	106,936	61,575,873	239,567	127,156,990	24,704	12,934,278	<u>4,184</u>	2,131,402
BIVINS A-3	Nov-20	0	10,961,114	0	3,548,629	0	2,772,147	0	4,159,384	0	407,301	0	73,653
BIVINS A-6	Nov-20	5,343	13,493,843	3,764	7,668,767	1,432	3,323,643	114	2,208,063	0	224,103	33	69,267
BIVINS A-13	Nov-20	36,168	10,183,430	9,706	4,996,768	9,040	2,606,066	15,374	2,265,321	1,770	253,392	278	61,882
BIVINS A-14	Nov-20	40,221	11,523,737	7,716	6,012,571	9,777	2,905,963	20,079	2,282,068	2,256	248,644	393	74,491
BIVINS A-4	Nov-20	30,767	15,218,123	2,693	2,570,859	7,323	3,683,801	18,425	8,014,695	1,970	809,310	357	139,458
BUSH A-2	Nov-20	6,451	14,154,160	267	2,026,000	1,613	3,476,735	4,081	7,736,478	451	798,279	39	116,669
Injection	Nov-20	17,674	66,691,832	12,335	48,172,339	4,837	17,180,010	394	785,113	0	44	108	554,327
inj Bivins A-3	Nov-20	0	(25,652,315)	0	(18,384,452)	0	(6,554,549)	0	(332,777)	0	0	0	(380,537)
inj Bivins A-6	Nov-20	(17,674)	(24,627,861)	(12,336)	(17,820,931)	(4,837)	(6,544,784)	(393)	(147,889)	(0)	(81)	(108)	(114,176)
inj Bivins A-13	Nov-20	0	(6,492,339)	0	(4,707,153)	0	(1,657,381)	0	(122,769)	0	(44)	0	(4,992)
inj Bivins A-14	Nov-20	0	(6,501,333)	0	(4,767,421)	0	(1,602,106)	0	(126,303)	0	(7)	0	(5,497)
inj Bivins A-4	Nov-20	0	(2,527,801)	0	(1,848,815)	0	(601,353)	0	(42,016)	0	0	0	(35,617)
inj Bush A-2	Nov-20	0	(867,658)	0	(625,258)	0	(215,406)	0	(13,980)	0	0	0	(13,015)
Production	Nov-20	0	1,256,556	0	925,850	0	270,686	0	48,231	0	3,205	0	8,584
BIVINS A-1	Nov-20	0	2,686,608	0	48,896	0	636,995	0	1,798,415	0	175,704	0	26,597
BIVINS A-2	Nov-20	20,789	15,005,167	651	1,913,679	5,149	3,665,036	14,471	8,457,620	495	842,749	23	126,083
BIVINS A-5	Nov-20	24,228	17,357,488	4,390	2,283,724	6,124	4,267,612	12,186	9,678,270	1,331	978,431	197	149,450
BIVINS A-7	Nov-20	15,362	12,520,692	4,644	2,997,422	3,967	3,158,114	6,047	5,691,673	608	582,453	97	91,029
BIVINS A-9	Nov-20	27,564	11,935,294	841	239,401	6,985	2,948,840	17,533	7,837,116	1,957	801,554	248	108,384
BIVINS A-11	Nov-20	18,464	7,393,124	552	167,116	4,601	1,842,005	11,796	4,814,635	1,319	499,026	196	70,343
BIVINS A-15	Nov-20	21,466	11,478,550	352	458,853	4,920	2,723,975	14,406	7,424,795	1,508	748,333	280	122,594
BIVINS B-1	Nov-20	30,833	9,679,162	697	338,108	7,498	2,350,283	20,041	6,244,358	2,118	642,398	478	104,015
BIVINS B-2	Nov-20	27,113	8,098,699	496	152,378	6,789	2,030,158	17,403	5,251,421	1,889	545,314	536	119,428
BUSH A-1	Nov-20	0	5,721,962	0	104,140	0	1,356,677	0	3,830,281	0	374,216	0	56,647
BUSH A-3	Nov-20	24,960	13,571,324	8,032	3,332,945	6,355	3,363,512	9,739	6,133,986	746	623,167	87	117,715
BUSH A-4	Nov-20	23,613	9,750,345	1,473	1,670,485	6,038	2,445,245	14,441	5,047,616	1,530	518,488	130	68,511
BUSH A-5	Nov-20	41,271	18,731,721	9,123	4,347,496	10,432	4,709,341	19,271	8,657,554	2,188	888,801	257	128,530
BUSH A-8	Nov-20	15,369	5,156,786	276	94,434	3,778	1,253,277	9,963	3,394,579	1,065	345,475	287	69,022
BUSH A-9	Nov-20	0	3,860,915	0	105,037	0	930,915	0	2,537,187	0	253,463	0	34,312
BUSH A-11	Nov-20	16,537	5,287,689	359	148,747	3,962	1,265,413	10,868	3,459,269	1,131	351,542	217	62,717
BUSH B-1	Nov-20	4,986	3,560,494	85	66,512	1,152	843,881	3,327	2,378,834	369	236,313	53	34,954
FUQUA A-1	Nov-20	0	2,954,098	0	53,854	0	702,798	0	1,975,175	0	193,573	0	28,699
FUQUA A-2	Nov-20	0	132,119	0	2,404	0	31,322	0	88,458	0	8,637	0	1,297
FUQUA A-3	Nov-20	0	9,303,912	0	577,005	0	2,277,687	0	5,790,357	0	583,701	0	75,162
TT Fuel	Nov-20	0	0	0	0	0	0	0	0	0	0	0	0
field-	wide pcts			13.00%	18.40%	24.78%	24.66%	55.52%	50.92%	5.73%	5.18%	0.97%	0.85%

Latest estimates of reserves and feed to HEU

Based on NITEC's 2003 reserves study from NITEC's interim report

est z-factor 0.980

As of EOM	Nov-20	Volumes in BCF				
Initial Gas In P	lace		330.040			
Produced 1924	to 1961		48.830			
Injected 1924 t	o 1961		0.450			
Remaining Gas	s In Place 1961		281.660			
Left Behind Pip	e, 1961		82.060	====>	1.500	BCF of contained helium
Remaining in F	Place, 1961		199.600			
Gas In Place 1	961		199.600			
Produced 1961	to July 2002		82.450			
Injected 1961 t	o July 2002		64.510		Net Helium	
Remaining Gas	s In Place July 2002		181.660		33.997	
Produced July	2002 through Dec 2	2002	1.096		0.743	
Production 200	3 - 19		113.305		27.048	
Injection 2003	- 19		(1.423)		(1.159)	
Produced to Da	ate 2020		4.102		0.548	
Injected to Dat	e 2020		(0.217)		(0.153)	
Amount of Rav	Gas Available to C	HEU	64.797	====>	6.968	total helium in reservoir
Estimated Bott	om Hole Pressure		238.727			

^{*} All volumes on Table 2 are reported in Mcf at 14.65 psia & 60°F

Table 3 - Gas Volumes & Inventory

November - 2020

Crude Helium Enrichment Unit Operations

		Gross V	Vithdrawal	Net Helium Withdrawal		Nitrogen Methane		hane	Ethar	ne plus	Other (CO2, Ar, H2)		
		Month	Cumulative	Month	Cumulative	Month	Cumulative	Month	Cumulative	Month	Cumulative	Month	Cumulative
Measured Feed	Nov-20	436,937	114,647,748	57,123	25,910,466	107,749	28,674,924	241,330	53,326,596	26,243	5,717,802	4,493	1,017,959
Calculated Feed	Nov-20	437,118	114,589,929	60,032	25,954,781	108,473	28,657,001	239,691	53,229,303	24,704	5,729,138	4,218	1,019,705
Feed to Box	Nov-20	433,432	113,819,558	60,032	25,954,960	108,473	28,657,084	239,691	53,229,349	24,704	5,729,132	532	249,034
Cheu Product	Nov-20	82,616	33,009,970	58,629	25,543,910	21,657	6,581,444	1,823	656,989	2	948	505	226,679
Residue	Nov-20	241,638	52,602,492	0	2,258	6,375	1,286,405	213,090	46,662,216	22,173	4,650,348	0	1,265
Cold Box Vent	Nov-20	64,823	18,649,726	33	93,252	55,353	16,513,500	9,425	1,980,828	0	319	13	61,827
Flare/Boot Strap	Nov-20	0	8,715,374	0	61,080	0	7,305,269	0	1,239,654	0	102,761	0	6,610
Fuel From Cheu	Nov-20	7,860	1,571,847	4	541	204	45,043	6,339	1,273,323	1,313	252,940	0	0
Shrinkage/Loss	Nov-20	1,216	618,819	0	0	0	0	0	0	1,216	618,819	0	0
Unaccounted*	Nov-20	35,279	4,961,144	1,366	199,395	24,884	3,327,411	9,014	1,429,117	(0)	901	15	4,320

*Before October 2004, the values are estimated

Storage Operations

Inventory	(contained	helium))
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	Government	Private
Beginning inventory	2,500,382	2,205,253
net acceptances +	0	0
redeliveries	0	(29,695)
In Kind Transfers	(32,497)	32,497
Conservation Crude Sales	0	0
Gain/loss	(6,627)	0
Ending Inventory	2,461,257	2,208,055
Total Helium in Reservoir	6,968,366	
Total Helium in Storage	4,669,312	
Helium in native gas	2,299,054	

Crude Helium Pipeline

Crude riellani ripellile			
_	Gross	Net Helium	Percent
Beginning inventory	28,924	20,559	71.08%
Measured to Pipeline (Private Plants)	21,379	15,104	70.65%
Measured from Pipeline (Private Plants	63,044	44,783	71.03%
HEU Production	82,616	58,629	70.97%
Injection	17,674	12,335	69.79%
Production	0	0	
Ending Inventory	43,052	30,546	70.95%
Gain/Loss	(9,148)	(6,627)	72.44%

Tuck Trigg Reservoir Operations

Since Field

Native Gas (Gross)	Month	Fiscal Year	Discovery
Total in place, beg. of period	5,198,688	5,198,688	5,890,000
Recoverable in place, beg. of period	4,528,688	4,528,688	5,220,000
Production during period to date	0	0	691,312
Total in place, end of month	5,198,688	5,198,688	5,198,688
Recoverable in place, end of month	4,528,688	4,528,688	4,528,688

 $^{^{\}star}$ All volumes on Table 3 are reported in Mcf at 14.65 psia & 60°F

Table 4 - In Kind Helium Sales

November - 2020

	NASA*	Navy*	Army*	Air Force*	DOE*	Other Fed*	Subtotal*	In Kind+	Charges I	Billed (\$)**
				In Kind H	elium					(billed quarterly)
Airgas Merchant Ga	ases, Contra	ct no. INC1	8-0102							
Month										
FYTD										
Air Liquide Helium	America, Inc	c., Contract	no. INC18	3-0104						
Month										
FYTD										
Air Products, L.P.,	Contract no.	INC18-010	5							
Month										
FYTD										
Messer, LLC, Conti	ract no. INC1	18-0106								
Month										
FYTD										
Praxair, Inc., Contra	act no. INC1	8-0112								
Month										
FYTD										
Matheson Tri-Gas,	Inc., Contrac	ct no. INC1	B-0114							
Month										
FYTD										
Global Gases Amer	rica, Contrac	t no. INC18	3-0116							
Month										
FYTD										
Total month	0	0	0	0	0	0	0	0		\$0
Total FYTD	0	0	0	0	0	0	0	0		\$0
Total CYTD	71,548	54	5	2	0	70,650	142,260	140,057		\$13,585,335
Cumulative	2,224,908	108,924	455	271,594	422,045	1,126,588	4,154,514	4,090,183		\$258,539,672
In Kind Transf	ers						Month	FYTD	CYTD	Cumulative
Transferred							32,497	39,919	205,764	4,106,977
Volume outstanding							(16,719)			

^{*} Volumes in Mcf at 14.7 psia & 70°F

**Rounded to nearest dollar

Natural Gas / Natural Gas Liquid Sales

	National Occupation	NOL - 4 n		1 5: 1/ 1	01	Dille el (6) es
	Natural Gas (Mcf)***	NGLs (gal)	Decatherms Avg Btu Value		Cnarges	Billed (\$)**
El Paso Natural Gas	<chk data=""></chk>	Provides Measure	ed Firm/Interruptible Trai	nsportation Services		(billed monthly)
Month	237,717		261,501	1,100	\$0	
FYTD	449,188		493,758	1,099	\$0	
Cumulative	51,912,347		56,552,548	1,089	(\$5,088,325)	
Minerals Manageme	ent Service	No Longer Provides Nat	tural Gas Marketing Ser	vices		
Cumulative					(\$179,913)	
ETC Marketing Ltd		Purchaser - Natural Gas	S	\$\$/Unit		
Month			260,200	\$2.161264	\$562,361	
FYTD			497,700	\$2.014153	\$1,002,444	
Cumulative			56,519,559	\$3.966290	\$223,346,426	
<u>Sandstone</u>		Purchaser - Natural Gas	urchaser - Natural Gas Liquids			
Month		89,205	9,641	\$3.858600	\$37,201	
FYTD		156,942	16,976	\$3.801824	\$64,540	
Cumulative		16,366,576	1,746,141	\$10.003892	\$17,468,207	
	Natural Gas (Mcf)***	NGLs (gal)	Purchased (Dth's)	\$\$ Per Unit (\$\$/Dth)		Total (\$\$)
Total month	237,717	89,205	269,841	\$2.221908		\$599,562
Total FYTD	449,188	156,942	514,676	\$2.073117		\$1,066,984
Total CYTD	1,943,939	717,472	2,284,805	\$1.296761		\$2,962,846
Cumulative	51,912,347	16,366,576	58,265,700	\$4.056811		\$235,546,394

^{***} Volumes in Mcf at 14.73 psia & 60°F

⁺ Volumes in Mcf at 14.65 psia & 60°F

Table 5 - Conservation Crude Sales/Reserve Sell-down Helium & Natural Gas Sales

November - 2020

This Table has been suspended as of 9/30/2018, BLM is no longer selling crude helium on the Open Market per Helium Stewardship Act of 2013.

All Volumes in Mcf at 14.7 psia & 70°F

Revenue Collected From Federal Leaseholds	Month*	FYTD*
Fee Sales & Royalties	\$1,904,511	\$3,945,070
Natural Gas Royalties (1)	\$0	\$0
Natural Gas Rentals	\$0	\$0
Other	<u>\$55,235</u>	<u>\$100,198</u>
Revenue Collected from Federal Lease Holds	\$1,914,782	\$4,000,304

^{*}Totals do not sum

Helium Analysis and Evaulation	Month	FYTD
Number of Sample Request Letters Sent	0	0
Number of Samples Received	0	0
Number of Samples Analyzed	0	0
Total Number of Samples Analyzed For Resources Division	0	0
Total Number of Other Samples Analyzed (2)	9	24

U. S. Helium Production

Domestic		CY Volume
2013 Helium Sold		4,623,130
2014 Helium Sold		4,166,708
2015 Helium Sold		3,463,698
2016 Helium Sold		3,466,014
2017 Helium Sold		4,644,278
Estimated Helium Resources as of 12/31/2016 (Mcf)		723,000,000

	FY-2017	CY-2017
U.S. Helium Exports (3)	2,520,645	2,451,207
US Helium Imports	731,407	666,908

- (1) Includes drip gas sales & other miscellaneous gas sales.
- (2) Includes pipeline, field survey, and other requested analyses.
- (3) Data from Department of Commerce Bureau of the Census.

Table 7 - Helium Storage Contract Activity All Volumes in Mcf at 14.65 psia & 60°F

November - 2020

All volumes	s in Mcf at 1				T		Ctonod	Chargo	a Dillad		
	Metered Gas Gross Gas Helium % Helium Helium		Transferred Gas Helium		Stored Helium	Charges Billed (\$)**					
	Gloss Gas	Month	пенит	FYTD	Helium CYTD	Cumulative		Cumulative	EOM	(Φ Month) FYTD
Total All Contra	acts*				<u> </u>	1					
Crude Acquired	21,379	70.6%	15,088	34,478	167,577	27,648,518	36,517	61,740,149			
Crude Disposed	63,044	71.0%	44,783	115,155	481,082	55,478,240	4,020	27,089,195		\$608,377.10	Storage Fees
Grade-A Rdlvrd	0	7 1.070	0	0	0	1,478,718	1,020	27,000,100		\$263,108.86	RMF Fees
Net/Balance	(41,665)		(29,695)	(80,677)		(29,308,440)	32,497	34,650,954	2,208,055	\$871,485.96	\$1,440,407
Total Prior Con		MINATED)	(29,093)	(00,077)	(313,303)	(29,300,440)	32,497	34,030,934	2,200,033	ψ07 1,405.90	φ1,440,407
Crude Acquired	iliaots (TEIXI	mital LD)		0	0	17,406,129	0	18,235,232			
Crude Disposed				0	0	11,830,863	0	19,187,102			
Grade-A Rdlvrd				0	0	1,478,718	0	19,167,102			
Number of trailers				0	0	9,834			0		
Messer, LLC, C		32/0		U	U	9,034			U		
Crude Acquired	ontract no.	3243									
Crude Disposed											
Net/Balance											
Praxair, Inc., Co	ontroot no 3	254									
	ontract no. 3	231									
Crude Acquired											
Crude Disposed											
Net/Balance	D 0	0050									
Air Products, L	.P., Contract	t no. 3256									
Crude Acquired Crude Disposed											
Net/Balance	A	lua Cant		204							
Air Liquide Heli	ium America	i, inc., Cont	ract no. 3	284							
Crude Acquired											
Crude Disposed											
Net/Balance	0- 110 0-		2007								
Keyes Helium (30., LLC, CO	ntract no. 3	3287								
Crude Acquired											
Crude Disposed											
Net/Balance											
Matheson Tri-G	as, inc., Coi	ntract no. 3	288								
Crude Acquired											
Crude Disposed											
Net/Balance											
Airgas Merchar	nt Gases, Co	ontract no.	3290								
Crude Acquired											
Crude Disposed											
Net/Balance	mania - O		202								
Global Gases A	America, Cor	itract no. 3	293								
Crude Acquired Crude Disposed											
Net/Balance											
Scout Energy F	Partners, Co	ntract no. 3	294								
Crude Acquired	•										
Crude Disposed											
Net/Balance											
IACX Energy, C	ontract no.	3297									
Crude Acquired											
Crude Disposed											
Net/Balance											
Uniper Global (Commodities	s North Am	erica LLC	Contract n	ю. 3298						
Crude Acquired											
Crude Disposed											
Net/Balance											

Government Helium						
Remaining Crude	2,500,382					
Crude Disposed:	In Kind Sales transferred for the month	(32,497)				
	0					
	Gains and Loses for the month	(6,627)				
Net/Balance of Pu	2,461,257					

Field/CHEU Compressor Operations	Month	FYTD	Cumulative	
Spot gas fuel price ∗	\$ per/MMBTU	\$2.16		
Fuel used * (now includes field compression well head)	total MMBTU	9,086	18,120	2,100,518
#1 Compressor run time *	hours	472	549	125,862
#2 Compressor run time *	hours	720	1,445	91,593
#3 Compressor run time *	hours	247	879	75,807

^{*} Field/CHEU Compressor Operations based on Nov 20 activity

Crude Helium Enrichment Unit (CHEU)	Month		FYTD		Cumulative
CHEU Runtime	Runtime Hrs	Percent	Runtime Hrs	Percent	Runtime Hrs
Processing feed gas	720	100.0%	1,465	100.1%	146,889
Producing residue gas	720	100.0%	1,438	98.3%	143,604
Producing helium product	642	89.2%	1,352	92.4%	139,400
Producing natural gas liquids	720	100.0%	1,434	98.0%	138,903

CHEU Utility Usage	Month	FYTD	Cumulative
Cheu Fuel Gas (Mcf) usage Nov 20	3,250	6,485	709,712
Cheu Pure Water Usage (gallons) Nov 20	3	1,286	331,475
Electricity Metered (Kwh) CHEU consumed Oct 20	2,738,846	5,077,514	246,105,323

Booster Compressor Operations and Usage	Month	FYTD	Cumulative
Electricity Metered (Kwh) Booster Compressor consumed Oct 20	685,189	1,275,921	6,416,001