



AUTHORITY FOR EXPENDITURE  
DRILLING AND COMPLETION

Operator: HighMark Energy Operating Well Number TBD  
Well Name: Duckhorn 1-13-12KH API Number TBD  
Operator WI: TBD County / State: 13/12-17N-12W Blaine Co, OK

Date: 11/15/2016  
AFE Number: TBD

PROJECT: Drill, complete, and equip 2 mile horizontal Mississippi well w/ multi-stage cemented plug & perf completion. +/- 9,750' TVD; +/- 20,060' MD.  
+/- 9,800' lateral length; 2,500 lb/R.

INTANGIBLE COSTS

Minor	Description	Drilling - 8153	Completion - 8155	Total
100	Location Roads & Survey	\$ 200,000	\$ 12,000	\$ 212,000
110	Surface Access & Right of Way	25,000		25,000
120	Rig	200,000		200,000
140	Daywork / Workover Rig	636,000	33,000	669,000
150	Coiled Tubing Unit		180,000	180,000
160	Fuel & Power	113,000		113,000
165	Drilling Water / Frac Water & Transfer	24,000	245,000	269,000
170	Bits & BHA / Downhole Rentals	247,000	60,000	307,000
175	Drill Pipe Rental	6,000		6,000
180	Open Hole Logging / Cased Hole Logging		5,000	5,000
185	Directional Drilling Services	206,000		206,000
190	Surface Equipment Rental	144,000	144,000	288,000
195	Field Office and Communications	47,000	17,000	64,000
200	Contract Service - Engineering & Geology	73,000	13,000	86,000
210	Tubular Inspection	8,000	3,000	11,000
220	Transportation	15,000	10,000	25,000
240	Fishing Tools & Services			
250	Mud & Chemicals	367,000	75,000	442,000
255	Mud Logging	33,000		33,000
260	Formation Evaluation	12,000		12,000
270	Cement Services & Float Equipment	164,000		164,000
280	Casing Crews	70,000		70,000
290	Stimulation		3,200,000	3,200,000
295	Pumping Services		92,000	92,000
300	Acidizing		10,000	10,000
315	Flowback & Well Testing		88,000	88,000
320	Mud Disposal / Salt Water Disposal	180,000	165,000	345,000
325	Environmental, Health & Safety	10,000	5,000	15,000
340	Perforating & Wireline Services		232,000	232,000
350	Wellsite Supervision	164,000	60,000	224,000
360	Other Labor	34,000	5,000	39,000
370	Surface Facility & Pipeline Installation Labor		50,000	50,000
700	Legal Expenses & Title	56,000		56,000
800	Other Expenses	10,000		10,000
850	Overhead	21,000	10,000	31,000
851	Insurance - Control of Well			
854	Contingency	153,000	236,000	389,000
	TOTAL INTANGIBLE	3,218,000	4,950,000	8,168,000

TANGIBLE COSTS

		Drilling - 8154	Completion - 8156	Total
100	Surface Casing	39,000		39,000
105	Intermediate Casing	215,000		215,000
115	Production Casing	396,000		396,000
120	Wellhead	18,000	32,000	50,000
110	Tubing		46,000	46,000
130	Downhole Equipment	15,000	10,000	25,000
135	Artificial Lift Equipment		12,000	12,000
140	Trucking	10,000	10,000	20,000
150	Conductor	12,000		12,000
160	Surface Facilities		240,000	240,000
170	Valves & Fittings		25,000	25,000
180	Flowlines		25,000	25,000
800	Other	7,000		7,000
	TOTAL TANGIBLE	712,000	400,000	1,112,000
	TOTAL AFE COSTS	\$ 3,930,000	\$ 5,350,000	\$ 9,280,000

It is recognized that the amounts herein are estimates only and approval of this authorization shall extend to the actual costs incurred in conducting the operation specified whether more or less than that herein set out.

HighMark Approval

VP Operations: Brandon Junker Date: 11/15/16  
COO: Stephen Pugh Date: 11/15/16

Partner Approval

Signature: \_\_\_\_\_ Company: \_\_\_\_\_  
Printed Name: \_\_\_\_\_ Date: \_\_\_\_\_  
Title/Position: \_\_\_\_\_ Phone #/Email: \_\_\_\_\_  
We \_\_\_\_\_ do \_\_\_\_\_ DO NOT elect to be covered by HighMark Energy Operating, LLC's Well Control Insurance.  
(please initia)



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