**Corporate Headquarters:**
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December 19, 2016

H. Roger Schwall
Assistant Director
United States Securities and Exchange Commission
Division of Corporation Finance
100 F Street, N.E.
Washington, D.C. 20549-3561

Re: RSP Permian, Inc.
Form 10-K for Fiscal Year Ended December 31, 2015
Filed February 25, 2016
File No. 1-36264

Ladies and Gentlemen:

Set forth below are the responses of RSP Permian, Inc. (the "***Company***", "***we***," "***us***" or "***our***"), to comments received from the staff of the Division of Corporation Finance (the "***Staff***") of the Securities and Exchange Commission (the "***Commission***") by letter dated December 5, 2016, with respect to Form 10-K for Fiscal Year Ended December 31, 2015, File No. 1-36264, filed with the Commission on February 25, 2016 (the "***Registration Statement***").

For your convenience, each response is prefaced by the exact text of the Staff's corresponding comment in bold, italicized text. All references to page numbers and captions correspond to the Form 10-K for Fiscal Year Ended December 31, 2015 unless otherwise specified.

**Form 10-K for the Fiscal Year Ended December 31, 2015**

**Oil and Natural Gas Data, page 36**

**PUDs, page 38**

1. ***We note that during 2015, you converted 6.6 MMBOE of proved undeveloped reserves to developed status. This is about 10% of the PUD reserves available at year-end 2014. In the years-ended 2012-2015 (9 percent, 19 percent, 17 percent, 10 percent, respectively), it appears that your four year cumulative conversion is about 55%. In part, the Glossary of FASB ASC Section 932-235-20 defines "Proved Undeveloped Oil and Gas Reserves" with "Undrilled locations can be classified as having undeveloped reserves only if a development plan has been adopted indicating that they are scheduled to be drilled within five years, unless the specific circumstances, justify a longer time." We would expect a five year development plan to result in annual***

***conversions averaging about 20 percent. Please explain the reasons for these low conversions.***

RESPONSE: We respectfully advise the Staff that all of our undrilled locations classified as having undeveloped reserves as of each of December 31, 2012, 2013, 2014 and 2015 were subject to a development plan that provided for their drilling within five years of their initial booking as proved undeveloped locations. For example, (i) 19%, 18% and 22% of our proved undeveloped reserves as of December 31, 2012 were converted in each of 2013, 2014 and 2015, respectively, (ii) 17% and 20% of our proved undeveloped reserves as of December 31, 2013 were converted in 2014 and 2015 and (iii) 10% of our proved undeveloped reserves as of December 31, 2014 were converted in 2015. The reduction in the percentage of our reserves converted during 2015 was the result of the substantial decline in commodity prices that began in late 2014 that continued throughout all of 2015. As a result of the continued decline in commodity prices during 2015, we substantially reduced our drilling and completion capital expenditures during 2015. For example, our 2014 drilling and completion capital expenditures were $442 million and our original 2015 drilling and completion capital expenditure budget was between $400-$450 million. Our actual drilling and completion expenditures during 2015 were $354 million. A portion of the reduction in our drilling and completion expenditures and the amount of proved developed reserves converted in 2015 was attributable to wells drilled during 2015 but not completed. We drilled 18 wells during 2015 that were not completed, representing approximately 3.2 MMBoe of proved undeveloped reserves. In addition, the Company's shift in 2015 from a mix of vertical and horizontal drilling to nearly exclusively horizontal drilling contributed to a drop in our conversion rate. Our conversion rate from PUD to PDP generally increases over time relative to a given year. The Company's transition from vertical and horizontal development to nearly exclusively horizontal development in 2015 caused a reset of this conversion rate.

2. ***Please furnish us with a list and analysis comparing the PUD locations that were scheduled to be drilled in 2016 by your year-end 2015 reserve report to those PUD locations that have been actually drilled. Include a spread sheet comparison of the pre-drill and post-drill estimated ultimate recoveries for the PUD locations that were drilled.***

RESPONSE: We respectfully advise the Staff that 13 of the 16 horizontal PUD locations that were scheduled to be completed in 2016 have been completed and are producing. One of the scheduled PUD locations has been drilled and is waiting on frac. The remaining two PUDs scheduled in our year-end 2015 report were deferred in 2016, although we anticipate converting them by 2020. We also converted to PDP one horizontal PUD in the year-end 2015 report that was not scheduled for conversion in 2016. In addition, the one vertical PUDs in the year-end 2015 report has been converted and is producing. Attached is a spread sheet comparison of the pre-drill and post-drill estimated ultimate recoveries for the PUD locations that were completed during 2016.

3. ***Your 2015 unit PUD development cost appears to be $16.36/BOE [= $108 million/6.6 MMBOE]. The unit development cost from the year-end 2015 standardized measure (page 101) is $12.55/BOE [=$1187 million/94.6 MMBOE]. Please explain the reasons***

***for this lower five year unit cost. Given that proved reserves are required to be economically producible "under existing economic conditions", we would expect these conversion costs to reflect the levels you have incurred. Please address your treatment of 18 "DUC" wells (page 6), e.g. whether they were included with converted PUDs.***

RESPONSE: We respectfully advise the Staff that the lower unit development cost from the year-end 2015 report as compared to the 2015 unit PUD development cost resulted from our understanding that by the end of 2015, when we prepared the year-end report, substantially lower service costs, increased drilling and completion efficiency and improved well performance made well costs under existing economic conditions more economic. All 18 of the "DUC" locations are currently producing, 7 of which were PUDs converted to PDP in 2016 and the 11 others were unproved and now producing.

**Developed and Undeveloped Acreage, page 41**

4. ***We note the expiration of significant net undeveloped acreage in 2016-2017. Please tell us the figures for any proved undeveloped reserves that you have attributed to locations that are scheduled for drilling after expiry. If applicable, address the approach you will employ to forestall the expiry of such acreage.***

RESPONSE: We respectfully advise the Staff that none of the proved undeveloped reserves as of December 31, 2015 were associated with locations scheduled for drilling after expiration of the applicable lease.

**Management's Discussion and Analysis of Financial Condition and Results of Operations, page 47**

**Critical Accounting Policies and Estimates, page 61**

**Impairment, page 61**

5. ***On page 61 of your Form 10-K and on page 10 of your Form 10-Q as of September 30, 2016, you continue to disclose that it is reasonably possible that oil and gas prices used in future impairment evaluations may decline and result in the impairment of your proved properties. Please revise the disclosure under this section and in additional areas of your filing, as applicable, to provide additional language addressing the risks resulting from the uncertainty associated with your commodity price assumptions. Per Section V of SEC Release No. 33-8350, provide an analysis of the sensitivity of the assumptions underlying your estimates to change based on outcomes that are reasonably likely to occur.***

RESPONSE: We would propose in future filings to make the following changes to our historical disclosure:

The capitalized costs of proved oil and natural gas properties are reviewed on a field level basis for impairment whenever events or changes in circumstances

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indicate that a decline in the recoverability of their carrying value may have occurred. This review is completed at least annually. We estimate the expected future cash flows of our oil and natural gas properties and compare these future cash flows to the carrying amount of the oil and natural gas properties to determine if the carrying amount is recoverable. If the carrying amount exceeds the estimated undiscounted future cash flows, we adjust the carrying amount of the oil and natural gas properties to fair value. We estimate fair value by discounting the projected future cash flows at an appropriate risk-adjusted discount rate. The calculation of expected future net cash flows in impairment evaluations are mainly based on estimates of future oil and natural gas prices, proved reserves and risk-adjusted probable reserves quantities, and estimates of future production and capital costs associated with our proved and risk-adjusted reserves. The Company's estimates for future oil and natural gas prices used in the impairment evaluations are based on observable prices for the next three years, and then held constant for the remaining lives of the properties. For purposes of our impairment analysis as of December 31, 2016, for 2017, 2018, 2019 and thereafter we used (i) average oil prices of $ , $ , $ and $ per Bbl, respectively, (ii) average NGL prices of $ , $ , $ and $ per Bbl, respectively, and (iii) average natural gas prices of $ , $ , $ and $ per MMBtu, respectively. Oil, NGLs and natural gas are commodities and, therefore, their prices are subject to wide fluctuations in response to relatively minor changes in supply and demand. Historically the commodities markets have been volatile, and these markets will likely continue to be volatile in the future. For example, during the period from January 1, 2014 through December 16, 2016, oil prices fluctuated from a high of $107.62 per Bbl on June 23, 2014 to $26.21 per Bbl on February 11, 2016, and natural gas prices fluctuated from a high of $7.92 per MMBtu on March 4, 2014 to a low of $1.49 per MMBtu on March 4, 2016. We are unable to predict the direction of future commodity prices. If the prices used to assess our oil and natural gas properties for impairment were 15% lower than the prices we used for such analysis, holding all other variables constant, we would not have expected to record any material impairment to our proved oil and natural properties.[1]

**Exhibit 99.1**

6. ***In part, FASB ASC Paragraph 932-235-50-26 states "…some expenses incurred at an entity's central administrative office may not be general corporate expenses, but rather may be operating expenses of oil- and gas-producing activities, and therefore shall be reported as such. The nature of an expense rather than the location of its incurrence shall determine whether it is an operating expense. Only those expenses identified by their nature as operating expenses shall be allocated as operating expenses in***

1 Please note that in response to the Staff's comment about 2015 year-end in the Form 10K and September 30, 2016 in the Quarterly Report on Form 10-Q, if the prices used to assess our oil and natural gas properties for impairment were 15% lower than the prices we used for such analysis, holding all other variables constant, we would not have expected to record any material impairment to our proved oil and natural properties for these time periods.

***computing the results of operations for oil and gas-producing activities." Explain to us whether your third party report (Exhibit 99.1) has included such costs in your projected production costs. If not, tell us the reasons for the omission of these costs.***

RESPONSE: We respectfully confirm to the staff that the RSP Permian estimates, as set forth in our third party report (Exhibit 99.1), has included an estimate of all central administrative office costs that are operating expenses in our projected production costs.

* * * * *

Please direct any questions that you have with respect to the foregoing or if any additional supplemental information is required by the Staff, please contact me at (214) 252-2728.

Very truly yours,

RSP PERMIAN, INC.

By: /s/ James Mutrie
James Mutrie, General Counsel

Enclosures

cc: Scott McNeill, Chief Financial Officer

**Annex A**

| PROPNUM | Well Name | WB Type | Current RCAT | YE15 RCAT | Pre-Drill EUR (MBOE) | Post Drill EUR (MBOE) | % of YE15 EUR | Comments |
|---|---|---|---|---|---|---|---|---|
| P6DF5HC0GH | CROSS BAR RANCH 1721WA | Horizontal | 1PDP | 4PUD | | | | WOF |
| P6DF5GE09J | CROSS BAR RANCH 1720LS | Horizontal | 1PDP | 4PUD | 783 | 833 | 106% | |
| P6BNBA9CF7 | CALVERLEY 09-04 4H WB | Horizontal | 1PDP | 4PUD | 745 | 1,164 | 156% | YE15 DUC |
| P7MKDPOIE9 | SPANISH TRAIL 228WA | Horizontal | 1PDP | 4PUD | 701 | 753 | 108% | YE15 DUC |
| P6UNE13LIP | SPANISH TRAIL 229LS | Horizontal | 1PDP | 4PUD | 679 | 854 | 126% | YE15 DUC |
| P6UNB5FURG | KEYSTONE 1004LS | Horizontal | 1PDP | 4PUD | 803 | 848 | 106% | YE15 DUC |
| Z2AJ8DUQYY | ISBELL 111WA | Horizontal | 1PDP | 4PUD | 609 | 531 | 87% | |
| P6HJB6ATUA | JOHNSON RANCH_10/15-01_LS_7200 | Horizontal | 1PDP | 4PUD | 783 | 872 | 111% | Renamed JR 1022 LS |
| Z2AJ8C9POY | Isbell 109LS | Horizontal | 1PDP | 4PUD | 583 | 466 | 80% | |
| P6UNE5CGKV | SPANISH TRAIL 229WB | Horizontal | 1PDP | 4PUD | 529 | 926 | 175% | YE15 DUC |
| P6UNEIWGUA | SPANISH TRAIL 4717LS | Horizontal | 1PDP | 4PUD | 956 | 1,067 | 112% | YE15 DUC |
| Z2AJ8DAR1Y | ISBELL 110WB | Horizontal | 1PDP | 4PUD | 460 | 414 | 90% | |
| Q2BJM1VCCX | SARAH ANN 3817LS | Horizontal | 1PDP | 4PUD | 508 | 516 | 102% | YE15 DUC |
| Q2DLN3VS2J | SPANISH TRAIL_03/46-10_LS_8000 | Horizontal | 4PUD | 4PUD | | | | Not converted, drilling southern wells |
| P7MKDL8KBC | DUKE WOODY N_04/09-06_WB_5000 | Horizontal | 4PUD | 4PUD | | | | Obligation relieved, deferred drilling |
| P6UNFFOLZ9 | KEMMER 4218H(LS) | Horizontal | 1PDP | 4PUD | 613 | 731 | 119% | Not originally scheduled, converted PUD to PDP |
| P4RFK3JLHI | SPANISH TRAIL 217H LS | Horizontal | 1PDP | 4PUD | 779 | 851 | 109% | PUD @ 15YE, flowback began end of 15 |
| P63CQO4G00 | CALVERLEY 09-02A | Vertical | 1PDP | 4PUD | 201 | 75 | 37% | |
| | **Operated Total** | | | | **9730** | **10901** | **112%** | |