Article Title: Criteria | Corporates | Industrials: Revised Assumptions For Assigning Recovery Ratings To The Debt Of Oil And Gas Exploration And Production Companies Data: (EDITOR'S NOTE: —On Nov. 10, 2021, we republished this criteria article to make nonmaterial changes. See the "Revisions And Updates" section for details.) 1. This article presents S&P; Global Ratings' methodology to determine recovery ratings for the debt of speculative-grade oil and gas exploration and production (E&P;) companies in countries where we perform recovery analysis. This article is related to S&P; Global Ratings' recovery analysis methodology, which is described in "Recovery Rating Criteria For Speculative-Grade Corporate Issuers." The article "Principles Of Credit Ratings" forms the basis of these criteria. SCOPE OF THE CRITERIA 2. The criteria cover certain assumptions S&P; Global Ratings uses when determining recovery and issue ratings for speculative-grade, oil and natural gas E&P; companies in countries, such as the U.S., where defaults have predominantly occurred during prolonged periods of weak oil and natural gas prices. The criteria address the approach and assumptions we use in our recovery analysis (subject to the information requirements in paragraph 9) to value hydrocarbon reserves and to estimate the amount outstanding on the reserve-based lending (RBL) revolving credit facilities that are widely used in the sector. SUMMARY OF THE CRITERIA 3. The information in this paragraph has been moved to the "Revisions And Updates" section. 4. This criteria update provides more detail on the methodology and assumptions we use to value the hydrocarbon reserves of E&P; companies in our recovery analysis with regard to: Utilizing commodity price assumptions that differ from our oil and gas recovery price deck when we expect a near-term default and current commodity prices are materially different (paragraph 13); Adjusting pricing differentials we view as anomalous or incompatible with a default scenario (paragraph 14. a); Valuing material non-U.S. reserves where market dynamics, breakeven prices, or risks are materially different than in the U.S. market (paragraphs 12 and 14); and Estimating reserve valuations in the absence of a current or updated reserve valuation from the company (paragraph 17). 5. We publish the commodity prices we use for recovery analyses in a separate article, which we update periodically, based on the principles outlined in this article. Changes to our commodity price assumptions could affect recovery and issue ratings significantly. 6. This paragraph has been deleted. METHODOLOGY Underlying criteria guidelines governing all recovery ratings 7. Recovery ratings and our recovery methodology apply to all speculative-grade corporate issuers in countries where we perform recovery analysis and are more fully described in "Recovery Rating Criteria For Speculative-Grade Corporate Issuers," published Dec. 7, 2016 (hereafter the Recovery Ratings Criteria). This analytical approach has three basic components: (1) determining the most likely path to default; (2) estimating the value of a company following default; and (3) distributing that value to estimated claimants based on relative priorities. 8. These criteria describe several key assumptions that we generally use when we apply the Recovery Ratings Criteria to assign recovery ratings to the debt of E&P; companies. More specifically, these assumptions include: a) Establishing a simulated path to default (paragraphs 10 and 13); b) Determining valuation: Commodity price assumptions used for valuation (paragraphs 10 to 13) and Present value reserve valuation parameters and other considerations (paragraphs 14 to 17); and c) Identifying and estimating the value of claims on reserve-based lending (RBL) facilities that are widely used in the sector (paragraphs 18 to 20). 9. The application of these key assumptions to E&P; companies requires that: Company specific annual reserve disclosure reports are available that follow, or that we view as substantially equivalent to, the rules and definitions established by the U.S. Securities and Exchange Commission (SEC); and Company-specific present value reserve valuations are available and are prepared by qualified petroleum engineers using the definitions of their annual reserve disclosures and commodity price assumptions and other parameters consistent with the methodology described in paragraphs 10 to 14, or we have sufficient information to extrapolate a reserve valuation using these parameters (paragraph 17). Standardized default and commodity price assumptions generally used The broad majority of past sector defaults occurred during prolonged periods of weak oil and natural gas prices. Consequently, for the purposes of these criteria, we use an extended period of weak hydrocarbon prices as a key element in the path to default for a majority of the speculative-grade E&P; companies we rate. However, our recovery analysis does not attempt to identify the exact price levels that would cause an individual E&P; company to default. Rather, our focus is on valuing a company's reserves at the end of the insolvency process based on a conservative

estimate of the commodity price levels that might persist during a period of weak demand for crude oil and natural gas. We detail our assumptions for oil and natural gas benchmark prices in our commentary "Recovery Price Deck Assumptions For Exploration And Production Companies Revised," which we publish and update periodically. 10. The recovery price deck assumptions generally reflect S&P; Global Ratings' estimate of the long term all-in levered break-even costs for the industry. The data we use to estimate these prices include all-in leveraged costs (cash operating costs plus exploration expense plus finding and development costs or depreciation, depletion and amortization expenses plus interest expense plus stock based compensation) and the strategic planning and cost assumptions for E&P; companies. We also review relevant industry research and forecasts on the oil and natural gas markets, which may address industry cost curves, hydrocarbon futures price curves, and recent price trends and volatility. Sources of industry research may include the U.S. Energy Information Administration, the International Energy Agency, Platts, and IHS, among others. We expect the recovery price deck assumptions to be more conservative, and more stable, than the general oil & gas price deck assumptions we use to assess and compare corporate credit quality in the industry. 11. Since oil trades on a global basis, we will often use the same commodity price assumptions to value global oil reserves. In contrast, natural gas markets are generally regional. Consequently, we will generally value gas reserves, where material, using region-specific price assumptions to determine the long-term all-in levered break-even costs because the economics of these reserves are widely driven by local market factors. Our analysis excludes reserves that a company would likely lose the rights to produce from in a default scenario. 12. When there is a heightened risk of a near-term default and hydrocarbon prices are materially different than the levels indicated in our recovery price deck, we will use a different set of commodity price assumptions for our recovery analysis. Typically, we would view companies with corporate credit ratings in the 'CCC' category to be at risk of a near-term default. In these instances, our default scenario reflects the issuer's particular circumstances, and we will base our hydrocarbon reserves valuation assumptions on the hydrocarbon prices indicated in our general oil and gas price deck. PV approach and related assumptions used to value E&P; company reserves 13. To estimate the value of an E&P; company's hydrocarbon reserves in a default scenario, we apply a present value (PV) valuation approach (present value of future net cash flows from a company's reserves, using a specified annual discount rate) to the company's existing proved reserves*. This valuation method is widely used for E&P; companies, in part because the U.S. Securities and Exchange Commission (SEC) requires oil and gas E&P; companies with publicly issued securities to disclose their reserve levels and values on an annual basis using a specified set of assumptions, including a 10% discount rate. One key advantage of this approach is that it adjusts for the timing of the cash flows of these long-life reserve assets. The PV valuations are prepared by a company's petroleum engineers and factor in each company's specific reserve characteristics. The PV valuations we use in our recovery analysis use the aforementioned benchmark commodity price assumptions and the other parameters (many of which are commonly used in the industry) outlined below: a) Realized commodity prices (relative to the benchmarks) include adjustments for location and quality related basis differentials. However, in applying these differentials we: Generally require differentials be applied as a percentage of current market prices if our benchmark price assumptions are different than current commodity prices. Require that current differentials be adjusted when we view them as temporary, unsustainable, or generally inconsistent with a default scenario. For example, we viewed the large variance between the Brent and Light Louisiana Sweet crude oil benchmarks over the West Texas Intermediate crude benchmark that arose in the first quarter of 2011 as unsustainable over the medium to long term and therefore inappropriate for recovery analysis (since a company benefitting from a large location-related premium is unlikely to default). b) Costs are held flat at current levels, unless directly tied to revenues (such as production taxes) or contractual arrangements. c) Asset retirement obligations (AROs) are netted out from the net cash flows and exclude any assumption for equipment salvage value. d) Any valuation impact from hedges is typically excluded because we would not expect them to be in place at the time of default. e) While SEC rules specify a 10% standard discount rate for reserve valuations, we may specify a different annual discount rate to better reflect market interest rates or required returns, or to account for a reserve profile that we view as more risky. For example, we would generally use a higher discount rate for reserves located in countries that we view as having

unreliable legal regimes or as less creditor friendly. To the extent we consistently use a discount rate other than 10% for all reserves due to market rates or return requirements, or we do so for reserves located in a particular jurisdiction that we view as risky, we will disclose this assumption along with our commodity price assumptions. In any event, our recovery reports will specify the discount rate used and, if it is a departure from our normal assumptions, our rationale. f) Reserves that are not economic at our specified discount rate (i.e., reserves that generate positive future cash flows at a 0% discount rate, but negative future cash flows at our specified discount rate) are generally excluded from the valuation, unless the company is obligated to develop the reserves under a take or pay agreement or similar commitment. When dealing with take or pay agreements and similar arrangements, the lesser of the cash outflows relating to the development or the nonperformance penalty may be used. g) Reserves or value accruing to other entities, whether due to partially owned subsidiaries or sharing arrangements that are based on royalties, net profits, or production volumes are excluded. h) The value pertaining to proven undeveloped (PUD) reserves is limited to 25% of the total PV reserve valuation because of the heightened uncertainty about the timing and costs of extracting this category of reserve. Banks often use similar caps on the value of PUD reserves when lending against their security interest in petroleum reserves. i) The value of unproved reserves (otherwise known as probable and possible reserves) are excluded because the economics of extracting these reserves are even more uncertain, especially in the stressed industry environment we assume in our recovery analysis. 14. We value material nonreserve assets (e.g., drilling rigs, gathering and processing equipment, etc.) separately when the value of these assets is not already captured in the PV valuation through improved economics (reduced costs or higher revenues), greater flexibility, etc. In these instances, we will generally value these assets using a discrete asset valuation approach that will discount the value of these assets to reflect the stresses inherent in the default scenario, consistent with our "Recovery Rating Criteria For Speculative-Grade Corporate Issuers." Reserve valuation considerations 15. Companies generally provide us with company-specific PV reserve valuations that use our assumptions at least annually, but more frequently if a company's reserve base changes significantly (e.g., due to large acquisitions or divestures) or if we change the applicable commodity price assumptions. 16. Absent a company-specific PV reserve valuation and in situations where we have sufficient information to extrapolate a reserve based valuation, as an alternative to our PV valuation approach, we will estimate a current reserve value by applying a reserve multiple (e.g., dollar value per thousand cubic feet equivalent {mcfe} or dollar value per barrel). We detail our alternative valuation assumptions in our commentary "S&P; Global Ratings Publishes Its Alternative Valuation Assumptions For Exploration And Production Companies' Debt Issue Ratings". These current reserve valuations will use conservative assumptions to adjust for the absence of updated company-specific information, especially where updated reserve disclosures are more limited. Reserve multiples will typically incorporate a combination of past PV valuations for the company and current PV valuations for the most relevant peers. In addition, if our recovery valuation assumes commodity prices at a different level than our recovery price deck, the reserve multiple may consider, as applicable, recent SEC PV10 reports for the company or peers, recent transaction values for similar reserves or companies, and/or market valuations for peers. In regions where reserves reporting practices deviate from established industry practices, we could discount or increase our estimated discrete unit prices ($ per mcfe or $ per barrel). We also may withdraw our issue and recovery ratings on a company's debt issuances if we do not have adequate information. Estimating the claims related to reserve-based lending (RBL) facilities used in the sector 17. Our recovery methodology generally projects that companies will have fully utilized their revolving loan facilities at default unless the facility has borrowing base limits or other robust restrictions that may reasonably be expected to limit borrowing availability. 18. Revolving loan facilities in the E&P; sector are typically reserve-based lending (RBL) structures that limit borrowing availability based on a conservative valuation of the underlying proved reserve collateral. Further, sector lenders generally target collateral coverage of at least 1.25x (i.e., borrowing-base to collateral of below 80%). Given our assumption of weak oil and gas prices and borrowing base restrictions that enable RBL lenders to reduce their commitment when reserve values decline, we generally estimate that total availability will not exceed 85% of our PV reserve valuation (using our recovery price deck assumptions), unless actual or projected usage over the next 12 months exceeds this amount. As with

all revolving facilities, we also adjust assumed borrowings for letters of credit issued under the facility that we expect to remain undrawn after default. 19. Many unsecured debt indentures in the sector include limitations on secured indebtedness based on a company's adjusted consolidated net tangible asset (ACNTA). While this test could constrain the amount drawn on a revolving credit facility in a default scenario, we have seen few companies trigger such restrictions and these scenarios have generally been temporary. As a result, even where an ACTNA test currently constrains the amount of secured borrowings, we will generally not assume this constraint remains intact through a payment default unless we believe a near-term payment default is likely to occur before a relaxation on that restriction. END NOTE *Proved reserves, consistent with U.S. SEC rules, are those quantities of oil and gas, which, by analysis of geoscience and engineering data, can be estimated with reasonable certainty to be economically producible—from a given date forward, from known reservoirs, and under existing economic conditions, operating methods, and government regulations—prior to the time at which contracts providing the right to operate expire, unless evidence indicates that renewal is reasonably certain, regardless of whether deterministic or probabilistic methods are used for the estimation. Proved reserves are categorized as proved developed producing (PDP), proved developed not producing (PDNP), and proved undeveloped (PUD) and exclude unproved reserves which are otherwise known as probable and possible reserves. For the purpose of our recovery analysis, however, these reserve estimates and resulting reserve values are computed using our commodity price assumptions and the other parameters noted herein rather than the SEC guidelines used for reporting purposes. REVISIONS AND UPDATES This article was originally published on Sept. 14, 2012. The criteria described in this article became effective upon publication and superseded "Revised Assumptions For Assigning Recovery Ratings To The Debt Of U.S. Oil And Gas Exploration And Production Companies," published Sept. 30, 2010. The scope of these criteria has been extended to apply to speculative-grade oil and gas E&P; companies outside of the U.S. Changes introduced after original publication: Following our periodic review completed on Sept. 15, 2017, we updated criteria references and aligned wording in paragraph 8 with that of "Recovery Rating Criteria For Speculative-Grade Corporate Issuers," published Dec. 7, 2016. Following our periodic review completed on Sept. 14, 2018, we updated the contact information. On Nov. 6, 2019, we republished this criteria article to make nonmaterial changes. We updated criteria references throughout the article, the contact information, and the "Related Criteria And Research" section. On Jan. 9, 2020, we republished this criteria article to make nonmaterial changes. In paragraphs 11 and 13, we removed references to criteria articles that are no longer relevant. We also updated the "Related Criteria And Research" section. On Nov. 10, 2021, we republished this criteria article to make nonmaterial changes to paragraph 16. Specifically, we clarified our approach to estimating a current reserve value when our PV10 valuation approach cannot be used. We also updated criteria references and the "Related Research" section. RELATED CRITERIA AND RESEARCH Related Criteria Recovery Rating Criteria For Speculative-Grade Corporate Issuers, Dec. 7, 2016 Principles Of Credit Ratings, Feb. 16, 2011 Related Research S&P; Global Ratings Publishes Its Alternative Valuation Assumptions For Exploration And Production Companies' Debt Issue Ratings, Nov. 9, 2021 Recovery Price Deck Assumptions For Exploration And Production Companies Revised, March 13, 2020 S&P; Lowers Its Hydrocarbon Price Deck Assumptions On Market Oversupply; Recovery Price Deck Assumptions Also Lowered