

Economic Insight, Inc.
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VIA COURIER

March 21, 1998

Mr. David S. Guzy, Chief
Rules and Procedures Staff
U.S. Department of the Interior
Mineral Management Service
Building 85, Denver Federal Center, Room A-212
Denver, Colorado 80225



Dear Mr. Guzy:

The attached comments are provided the MMS concerning the supplementary proposed rule amending the regulations establishing the value of oil from Federal leases, published in the Federal Register February 6, 1998. These issues arose during the MMS' hearing in Bakersfield on March 11, 1998 and Mr. Christnacht of the Economic Valuation Branch of the MMS asked me to submit my comments in writing. This discussion is narrowly directed at the proposed valuation for California crude oils. There are, of course, numerous other issues raised by the latest proposed rulemaking from the MMS that are not covered herein.

I wish to focus on one issue – the proposal to value California crude oils using spot prices of Alaska North Slope crude oil – because I think that this approach could create particularly serious problems and result in an unfair valuation for both lessors and lessees.

These remarks are intended to supplement two reports I prepared for Texaco Inc., submitted as part of their comments in earlier stages of the proposed rulemaking.

Sincerely yours,

A handwritten signature in black ink, appearing to read 'Sam Van Vactor', written over a horizontal line.

Samuel A. Van Vactor
President

1. Location and quality adjustments between similar and dissimilar crude oils.

Both posted price bulletins and pipeline quality banks account for differences in crude oil quality using API gravity and the percentage of sulfur in the crude oil.¹ These differences are referred to as gravity and sulfur differentials or penalties. These differentials are intended to capture relatively small variations in value between crude oils of similar origin and locale. They are not intended to calculate value differences between two distinct families of crude oils.

For companies posting crude-oil prices, gravity price differentials are necessary because API gravity may vary within an oil field. For most fields, the gravity variation is not great – only a few degrees. Attached is a California crude oil posting from Tosco (posting under the name of Union 76) for March 16, 1998. The base gravity of the posting for each field is identified along with a price. Further, the bulletin specifies a price-gravity differential of \$0.20 per API degree. Thus there are three crucial pieces of information: the field from which the crude oil is derived, the price-gravity differential, and the price at a stated gravity. The field name itself is a necessary ingredient since much is known about quality (as well as location) which may not be directly captured in the price-gravity and sulfur differentials.

This posting bulletin can be used to demonstrate the difficulties inherent in the use of gravity adjustments between fields to derive prices. For example, Midway Sunset at 13° API gravity is posted at \$6.25 while Cymric at 14° is posted at \$6.30. Since the location of these fields is similar and the base gravities are one degree apart, the simplistic application of the gravity-price differential would be expected to result in a \$0.20 difference rather than the \$0.05 difference observed. Other factors underlie the smaller price difference.

The Lost Hills field has two postings in the Tosco bulletin: one for oil with API gravity 28° and above, and a second for oil with API gravity of less than 28°.

¹ Crude-oil posted price bulletins in California cite API gravity price differentials to one-tenth of a degree. Prices for California crude oils are also differentiated by field of origin. Consequently, it is not necessary to publish differentials for sulfur; since sulfur content can be accurately estimated from crude-oil assays known to buyers and sellers. In contrast, some mid-continent crude oils (such as West Texas Sour, West Texas Intermediate and, West Texas Sweet) are blended from multiple fields. These oils are differentiated by sulfur content to strict standards.

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The Lost Hills prices posted for 31° and 18° differ on this particular date by \$3.25, whereas the application of the gravity differential would imply a difference of \$2.60. If gravity were the only factor, two postings would not be necessary.

A final example is the Wilmington and Inglewood fields, which are both located in the Los Angeles Basin. Wilmington, posted at 17° was priced at \$6.90, while Inglewood, posted at 20° was priced at \$8.50. The gravity-price differential accounts for only \$0.60 of the \$1.60 price difference.

Thus, even *within* California, seemingly straightforward inter-field comparisons are problematic, as are comparisons over large gravity ranges within the same field. Comparisons of a wide variety of California crude oils with a benchmark such as ANS, which is not within the family of California crude oils, would be even more difficult.

Similar qualification needs to be given when interpreting pipeline gravity and sulfur banks. These differentials are established by pipeline owners to account for quality differences between the specific crude oils delivered and received by the shippers. However, these banks are only applicable within certain quality ranges. For example, in the case of the All American Pipeline, OCS sour crude oils are shipped in separate batches from lower sulfur SJV crude oils. A shipper cannot deliver OCS sour crude oil, receive low-sulfur SJV crude oil blend and simply adjust for value differences using the pipeline's gravity and sulfur banks. Pipeline shipping rules prevent that for good reasons; the crude oil blends cited are too dissimilar to use simple gravity and sulfur differentials to determine value differences.

API gravity and sulfur content are only rough indicators of crude oil quality. API gravity is a reasonably good indicator of petroleum product yield in an unsophisticated refinery.² Product yield is, however, only one aspect of crude-oil value. Some of the other factors that impact value include the presence of heavy metals, nitrogen content, refining predictability, and production volume (which impacts transactions and handling costs). Even when all of these factors and location are held constant, API gravity and sulfur percentage are imperfect

² When crude oil is distilled, intermediate petroleum products boil off at various temperatures. The percentage of each is known as product yield. Intermediate products such as naphtha, kerosene, middle distillates and residual oil evaporate in descending order. Generally light products are more valuable, which is one of the reasons that light crude oil fetches a higher price than heavy crude oil.

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indicators of crude-oil value. Yield varies and in some crude oils sulfur binds more actively to light petroleum products than in others.

During the hearing, I illustrated this point by noting that both the gravity and quality of ANS is changing. The principal field on the North Slope, Prudhoe Bay, contains extensive reserves of natural gas. Some of this gas is now processed into natural gas liquids (NGL) and is injected into the crude oil stream. As the proportion of NGL to crude oil changes, the gravity and quality of the ANS blend changes.

Adding NGL to crude oil increases its API gravity, but may or may not increase its economic value. An extreme case, a blend of heavy crude oil and NGL, is known as a "dumbbell" oil, because it contains only very light and very heavy material. Such dumbbell oil lacks the most valuable parts of a barrel of crude oil, the middle distillates, which can be most cheaply refined into heating oil, diesel fuel, jet fuel or gasoline.

ANS and California crude oils do not have the same quality characteristics. In data collected by Reuters, Dow Jones, and Platt's, ANS spot prices have generally been higher than California crude oils when they are adjusted for location, and by the gravity and sulfur differentials from California oil pipelines or published in posted price bulletins. As I indicated, however, the relationship could change if the proportion of NGL in ANS oil continues to increase. It is conceivable that the historic relationship between ANS and California crude oils could reverse. In such circumstances, royalties collected by the MMS based on an ANS price index would be below true market value.

In some cases it may be true that the only way to establish market value of royalty oil is to analyze sales data from a "proxy" crude oil since price data on the crude oil in question simply does not exist. This is not the case with California crude oils. Many California crude oils are tendered for outright sale and this activity could be expanded. In addition to numerous crude-oil postings, spot price assessments are collected by trade press survey for Kern River/Midway Sunset, Wilmington, and Line 63.

The primary indicator of the market value of any commodity should always be the direct evidence of outright arm's length purchases and sales. Whenever possible the MMS should avoid calculating the royalty obligation using indexes or proxy crude-oil prices, because these proxies can deviate from fair market value in unpredictable ways.

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2. Sources of ANS spot price assessments.

The news agencies that collect and publish data on ANS prices do so by selecting a variety of trades which occur throughout the West Coast and Hawaii, as well as for delivery in California. In contrast, California crude oils are rarely refined outside the state. This may explain in part why ANS prices move quite differently from California crude-oil prices. Prices offered by Puget Sound refiners for crude-oil feedstocks may vary from those offered by California refiners.

Although this may not result in a particularly serious bias at present, it could be a cause for concern in the future. As ANS production declines, it is likely that the volume marketed in California will decline more rapidly than in Puget Sound or Hawaii. Thus, if California royalty oils are indexed to ANS prices, they will be subject to irrelevant market events.

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Attachment to Comments by Samuel A. Van Vactor
March 20, 1998

**California Posting Bulletin
Tosco Refining March 16, 1998**

CRUDE PRICE BULLETIN
CALIFORNIA AND ALASKA

471

Effective 7:00 a.m. Mar 16, 1998, subject to change without notice, subject to the terms and conditions of its contracts, Union 76 will pay the following prices for its purchases of the named crude oils delivered for its account to its authorized carrier or receiving agency.

The prices posted are based upon computation of volume by the use of 100% tank tables or as measured by approved automatic custody transfer facilities with full deduction for sediment and water and corrected for temperature to 60 deg. F. All prices may be subject to deductions for trucking and other charges where applicable.

Field	Base Gravity	Price \$/Bbl	Field	Base Gravity	Price \$/Bbl
Aliso Canyon	16.0	6.00 *	Midway-Sunset	13.0	6.25 *
Asphalto	33.0	9.85 *	Montebello	23.0	8.70 *
Bardsdale	27.0	8.85 *	Mountain View	32.0	9.55 *
Belmont (Offshore)	25.0	8.50 *	Newhall-Potrero	32.0	9.50 *
Belridge (28.0 API & Above)	31.0	10.00 *	Oak Park	21.0	7.40 *
Belridge (Below 28.0 API)	13.0	6.25 *	Oakridge	19.0	6.50 *
Beverly Hills	27.0	8.65 *	Oat Mountain	19.0	6.30 *
Big Mountain	20.0	6.60 *	Ojai	29.0	8.80 *
Brea Olinda	20.0	7.80 *	Orcutt	25.0	6.05 *
Buena Vista	26.0	8.95 *	Playa Del Rey	24.0	7.35 *
Casmalia	9.0	2.30 *	Pleasant Valley	24.0	8.20 *
Cat Canyon	11.0	2.85 *	Point Arguello (Onshore)	19.0	3.70 *
Coalinga	15.0	6.85 *	Pyramid Hills	16.0	6.50 *
Coyote East	23.0	8.35 *	Raisin City	21.0	7.45 *
Cymric	14.0	6.30 *	Richfield	19.0	7.10 *
Del Valle	33.0	8.95 *	Rosecrans	34.0	10.05 *
Dominguez	30.0	9.35 *	Sansinena	17.0	6.55 *
Edison	16.0	6.25 *	Santa Fe Springs	31.0	9.70 *
Gujarral Hills	37.0	9.90 *	Santa Maria Valley	15.0	3.60 *
Huntington Beach	20.0	7.55 *	Santa Paula	28.0	8.85 *
Inglewood	21.0	8.50 *	Santa Susana	36.0	9.90 *
Kern Front	13.0	6.25 *	Shiells Canyon	33.0	9.60 *
Kern River	13.0	6.25 *	Simi	19.0	6.70 *
Kettleman Hills	34.0	10.40 *	South Mountain	32.0	9.20 *
Las Cienegas	32.0	9.60 *	Tapo Canyon South	26.0	8.20 *
Las Lajas	20.0	6.80 *	Tapo Ridge	16.0	5.90 *
Lion Mountain Area	28.0	8.90 *	Temblor Ranch	15.0	6.30 *
Lompoc	21.0	5.60 *	Torrey Canyon	25.0	7.75 *
Long Beach (Sig. Hill)	29.0	9.40 *	Ventura Avenue	28.0	8.95 *
Lost Hills (API 28 & Above)	31.0	10.00 *	West Mountain	19.0	4.85 *
Lost Hills (Under 28.0 API)	18.0	6.75 *	Whittier	24.0	8.65 *
McKittnck	15.0	6.25 *	Wilmington	17.0	6.90 *
			Yorba Linda	15.0	6.25 *

* Indicates Change

A recorded message containing information on Union 76's latest Crude Oil Price Bulletin is available by calling (888) 688-0600, ext. 4068

PRICE CHANGE WITH GRAVITY

All prices listed are subject to the following increases and decreases for each tenth degree of gravity respectively above or below the base posted gravity.

Gravity Range API	Price Adjustment \$/Bbl/Tenth degree API
Above 40.0 API	0.000
34.0 to 40.0 API	0.010
20.0 to 34.0	0.020
Below 20.0	0.020

This bulletin supersedes Crude Oil Price Schedule -

470 California