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Petroleum exploration and production in the Ninth district

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One of the industries which has introduced a significant element of diversification to the economy of the western Ninth district is petroleum production and refining. Although production in Montana dates back to World War I, the discovery of oil in the Nesson Anticline portion of the Williston Basin in 1951, began the development of a substantial new oil industry in North Dakota and Montana. The purpose of this article is to outline recent trends in exploration and production, to discuss the relationship between reserves and production, and to comment on certain developments which will influence the longer-term course of the industry.

Recent trends

Subsequent to the discovery of oil in North Dakota in April 1951, occurred a marked increase in geological and geophysical work in Montana and North and South Dakota. This increase and the subsequent decline is shown in the following tabulation of the number of seismograph party weeks.

SEISMOGRAPH PARTY WEEKS, NINTH DISTRICT STATES

(Number of party weeks)

	Montana	North Dakota	South Dakota	Total
1961	447	187	13	647
1960	1,048	381	52	1,481
1959	654	362	49	1,065
1958	141	464	0	605
1957	936	293	23	1,252
1956	1,472	316	84	1,872
1955	1,440	504	104	2,048
1954	1,928	1,235	268	3,431
1953	3,147	1,619	269	5,035
1952	1,848	278	2,728	4,854
1951	566	215	1,061	1,842
1950	648	253	151	1,052

Source: June issues of the Bulletin of the American Association of Petroleum Geologists.

The recent decline in geophysical activity in the three states is part of an over-all decline in seismograph work in both Canada and the U. S., which has occurred because of the general oversupply of domestic and foreign crude oil and because of the priority given by major oil companies, which do most of the seismograph work, to their foreign concessions. The decline shown in the tabulation, however, was greater than that experienced generally in Canada and the U. S. In 1953, the peak year, seismograph work in the three states was 13 percent of all seismograph work in the two countries, but by 1959, it had declined to only 4.5 percent. This relatively large decline occurred partly because new discoveries in the latter part of the period did not equal those found from 1951 to 1957. The more significant explanation, however, lies in the fact that the major companies already have under lease a large portion of the more favorable areas and are

*This article is a condensation of Dr. William E. Koenker's study for the Minneapolis Federal Reserve Bank, published under the title Petroleum Reserves and Production Facilities in the Ninth Federal Reserve District.

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postponing further exploratory work until domestic prices improve.

The trend in geophysical work in Montana and North Dakota was matched, with a slight lag, by developments in exploratory drilling. The most consequential type of exploratory operation concerned the search for new field wildcats, which involves drilling on a structure or an environment never before productive. The following tabulation indicates the amount of new field wildcat drilling since 1951.

NEW FIELD WILDCATS

	Montana		North Dakota		South Dakota	
Year	Producer	Dry hole	Producer	Dry hole	Producer	Dry hole
1961	3	155	3	75	0	5
1960	6	138	6	64	0	8
1959	3	93	10	77	2	13
1958	9	110	17	114	1	10
1957	5	172	18	138	0	40
1956	7	182	5	82	0	45
1955	9	163	6	60	1	39
1954	6	125	3	115	1	17
1953	6	121	7	68	0	18
1952	10	98	4	33	0	17
1951	5	63	1	10	0	6

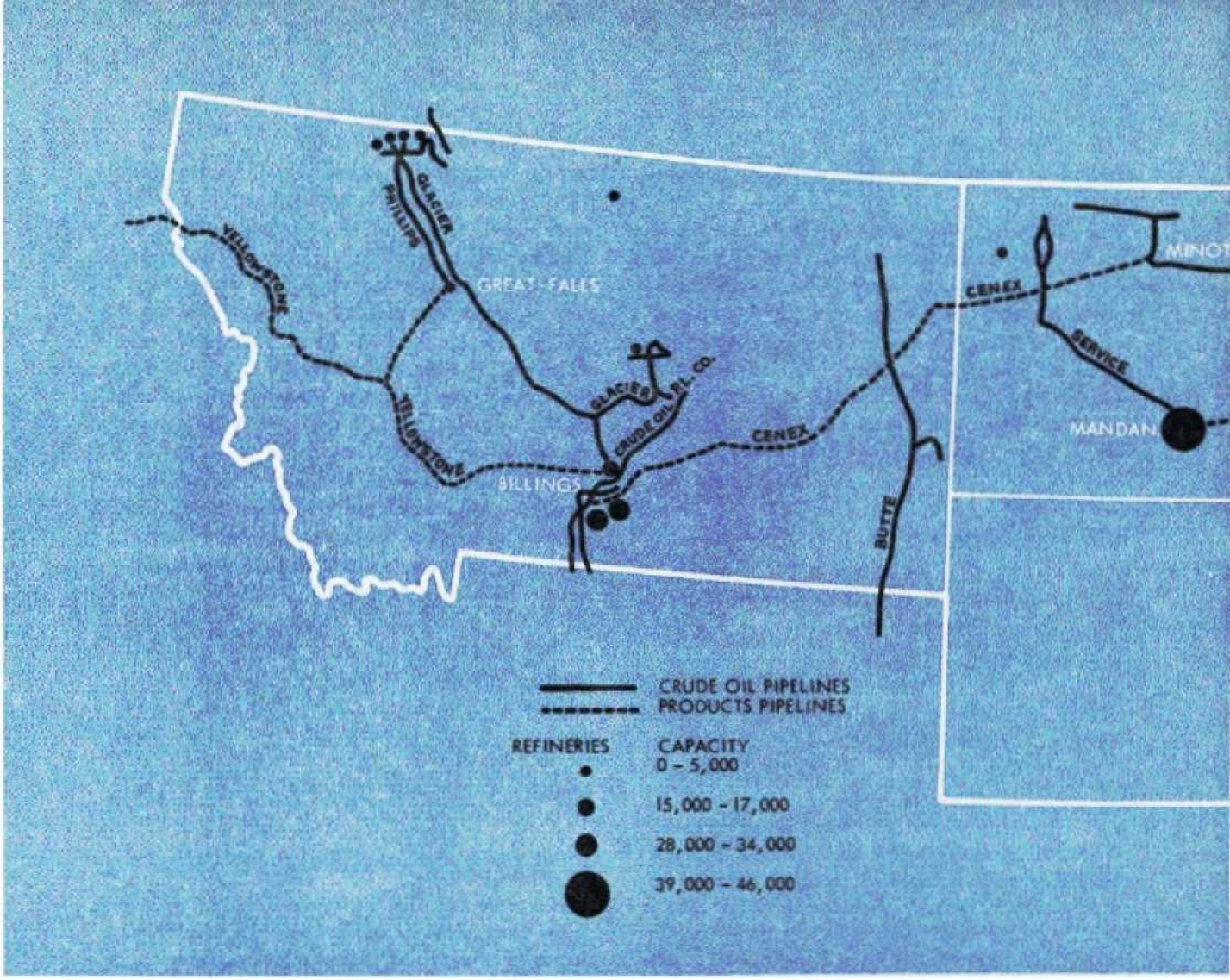
It will be noted that the decline in wildcat drilling has been greater in North Dakota and South Dakota than it has been in Montana. In part this has been due to the greater depth of wells in western North Dakota and the hesitancy of independents to undertake the greater risk involved in deep drilling. The larger decline in North Dakota occurred despite the fact that the ratio of dry holes to producing new field wildcats over the decade was only about 10 to 1 in North Dakota, while it was about 20 to 1 in Montana. These ratios both are higher than the 8 to 1 ratio which prevailed for the total U. S. over the decade.

The fact that a new field wildcat may be a producer does not mean that the field will be profitable in terms of eventual payout. A field is assumed to be profitable only if it has ultimate recoverable reserves of at least 1 million barrels of oil or 6 billion cubic feet of gas. North Dakota has experienced 47 profitable new fields out of the 915 new field wildcats drilled over the last decade. This is a success ratio of slightly more than 5 percent, much in excess of the recent average of 1.47 percent for the U. S. Thus, while the number of producing wells relative to dry holes has been below the national average, the proportion of genuinely profitable strikes has exceeded the national average.

Production of oil in Montana increased from about 9 million barrels per year in 1950, to almost 31 million barrels in 1961. In North Dakota, production increased from 25,000 barrels in 1951, to over 23 million barrels in 1961. North Dakota production could be or might be substantially greater if production from its principal fields (those along the Nesson Anticline) were not prorated to the amount of crude which can be taken by the Mandan refinery. In contrast, Montana exerts control over production only when it is apparent that certain wells may produce at a rate harmful to the reservoir.

Crude oil prices

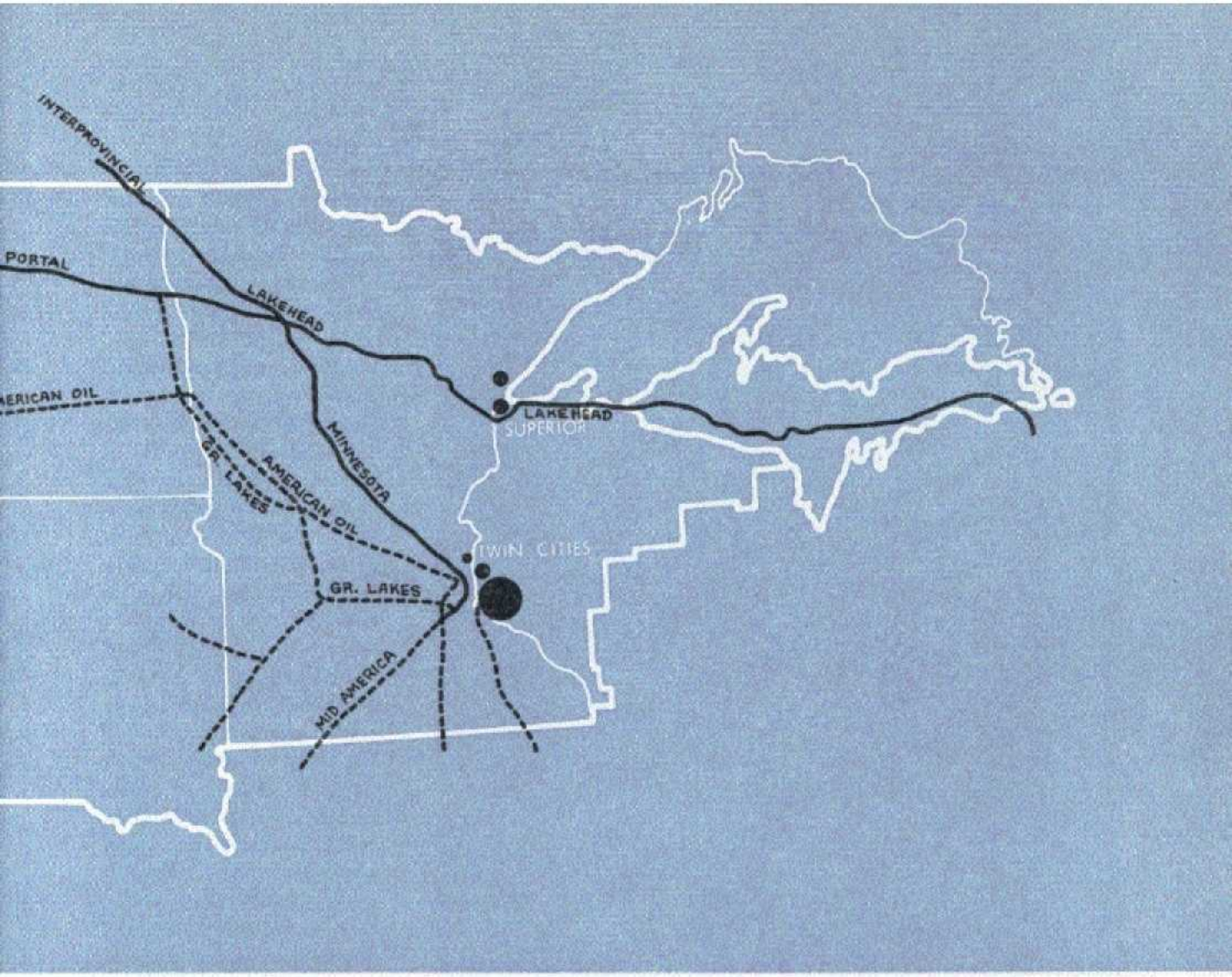
The price received for crude oil at the well depends mainly on its quality and the cost of getting it to refineries. Quality differences are stated primarily in terms of gravity with the lighter crude being worth from 2 to 5 cents per barrel more because of the higher gasoline yield. Crude oils with sulphur content in excess of ½ of 1 percent are priced at a discount which will vary in proportion to the proximity of refineries able to take sour crude. Crude prices at the well vary from the $2.95 price for most oil produced along the Nesson Anticline in North Dakota, to around $2.40 for most Montana crude and as low as $1.84 for some North Dakota heavy crude which currently has to move to Twin City refineries by combination of rail and pipeline. Mainly because of the distance to primary refining areas, the average price of Ninth district crude is somewhat



below the 1961 national average of $2.89 per barrel at the well.

With the completion this month of the Portal Pipeline from Minot to Clearbrook, Minnesota, all of the major producing fields in the district will be served by pipeline transport. Only isolated small fields in Montana and western North Dakota will still utilize truck and rail. The economic advantage of pipeline transport is illustrated in the Humble line from south central Montana to Billings. The rail rate was 24 cents, the initial pipeline rate was 12½ cents, and the current rate is 6 cents per barrel. The present rail-pipeline rate from fields in the Lignite, Newberg, Sherwood areas of North Dakota to Twin Cities or Head-of-the-Lakes refineries is 70 cents per barrel. The new all-pipeline rate to the Head of the Lakes will be 47 cents, and to the Twin Cities it will be 56 cents. These rates are in addition to a gathering charge of 12-14 cents, which is not being changed with the opening up of the new Portal line.

The 16-inch Portal Pipeline has a present design capacity of 70,000 barrels per day. This could be increased to 100,000 barrels; however, there are currently available only about 25,000 barrels of

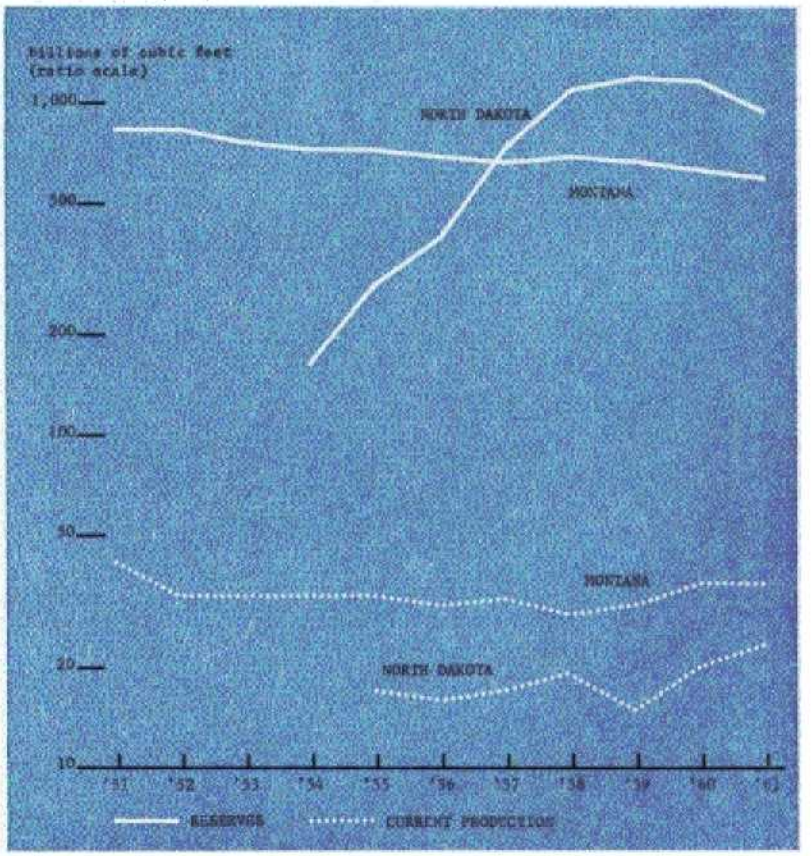


throughput per day. This disparity means that the owners (Great Northern Railroad–45% Hunt Oil Company–45% and Northwestern Refinery–10%) either are optimistic about the prospects of increased production in the area or expect to divert some current production going in other directions. If additional throughput can be found, it will make possible further substantial reductions in rates.

In addition to quality factors and transport cost differentials, the net price of crude at the well is affected by severance and other taxes on production. In North Dakota the severance tax, levied in lieu of all other taxes, amounts to only 5 percent of the value of current production. This was estimated in a recent study at about 13.9 cents per barrel, somewhat more than the 11.1 cent tax in Wyoming, but much less than the 20.1 cent tax per barrel in Montana.[1] The Montana tax is a combination of license, conservation and general property tax and is currently subject to considerable criticism from drilling contractors and other

[1] Data from O. H. Harnish, **A Comparative Tax Study of Montana's Oil Industry**, Bureau of Mines and Geology, Montana School of Mines, Butte, 1961.

Chart 1 — Proved natural gas reserves and current production, Montana and North Dakota.



independent operators, who argue that it discourages exploration and drilling in that state.

The network of crude oil pipelines, product lines and refineries in the district is shown on the map. Most of the integrated companies having refineries in the district also have a controlling or substantial interest either in crude lines, in product lines or in both. This control assures them a regular supply of crude and access to markets.

In addition to six refineries in the region owned by major integrated companies, eleven independent refineries operate, to encompass almost half of the refining capacity of the region. Six of these are relatively small units, with less than 5,000 barrels of capacity per stream day. Most small, nonintegrated refineries lack modern equipment for catalytic cracking and other processes, and operate under a large cost disadvantage. However, many of them seem able to operate successfully, because they have found a niche in the industry where they are sheltered from direct competition with the major, name-brand companies. In some cases they make good use of a special type of crude not desired by the integrated companies; in other cases they market a special product or supply their own retail outlets.

Independent refineries without access to foreign crude have been particularly subject to the cost-price squeeze of the past decade. Between 1951 and 1961, the average price of refinery products increased by only about 5 percent, whereas the price of crude increased by about 17 percent. The product-versus-crude-price spread per barrel declined from $1.13 in 1951, to 87 cents in 1961. This forced even the smaller refineries to install new equipment to secure more high-octane gasoline and other higher-valued products out of their crude, and to get more than a barrel of products out of their crude.

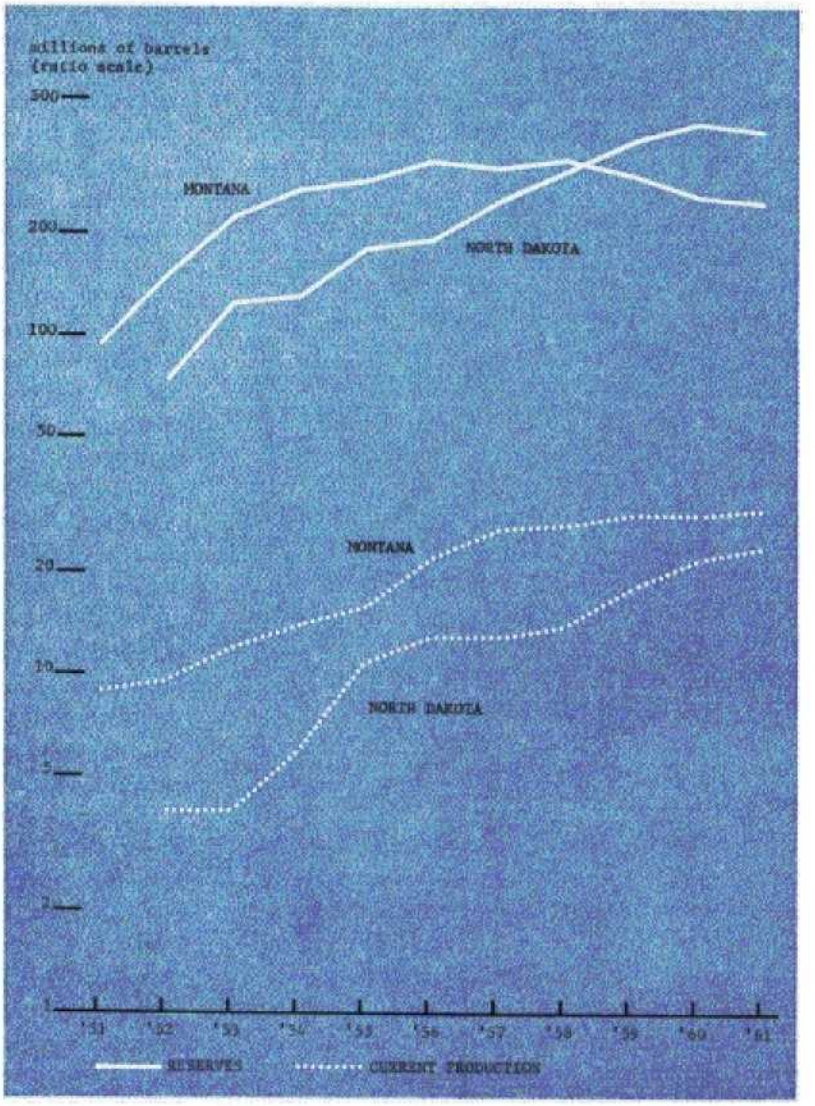
Natural gas and natural gas liquids

In addition to crude oil producing and refining in the region exists a substantial natural gas in-

dustry. Most of the gas reserves in North Dakota are associated with oil or are dissolved in solution with oil, which means that gas will be produced only as a joint product with oil. In Montana, the gas is mainly of the non-associated type. Measured in terms of comparable unit heating values, the natural gas reserves of both states are equivalent to about two-fifths of the liquid petroleum reserves. Much of the natural gas needs to be produced at a rather even rate throughout the year, despite the fact that its primary use for space heating tends to be concentrated in the winter months. This has led to the development of a very substantial amount of storage space (about 91 billion cubic feet) located mainly in the Baker field in Montana.

In addition to natural gas, Montana and particularly North Dakota have substantial reserves of natural gas liquids. Two plants in Montana and three relatively new plants in North Dakota extract liquifiable petroleum products (propane, butane and natural gasoline) and then sell the dry gas to gas transmission companies. Prices of natural gas come under the new area pricing regulation of the Federal Power Commission and currently range from about 5 cents per thousand cubic feet in the older Montana fields, to 15 and 16 cents for gas produced in the Nesson Anticline area of North Dakota.

Chart 2 — Proved crude oil reserves and current production, Montana and North Dakota.



Reserves of natural gas and crude oil

The data in Chart I indicate the trend over the past decade in reserves and production of natural gas. A decline in natural gas reserves in Montana has occurred since the peak in 1952, and North Dakota's gas reserves have suffered a very recent downturn. The current situation with respect to

the relation between reserves and production of natural gas is shown in the following tabulation. Data are in billions of cubic feet.

	Production during 1961	Proved reserves at end of 1961	Ratio of reserves to current production
Montana	36	596	16.6
North Dakota	23	949	41.5

These data signify that at the present rate of use and in the absence of any new discoveries, Montana's gas reserves would last only about 16.6 years. Montana distribution companies are already importing substantial amounts of gas from Wyoming, and are likely to begin importing from Canada. In North Dakota, where gas production is restricted indirectly through market demand pro-rationing of oil production, the existing proved reserves would last over 40 years at the current level of utilization. Natural gas used in eastern North Dakota and northern Minnesota is brought in from Canada.

The data in Chart II indicate that proved crude oil reserves in Montana have declined substantially since 1954, and that they have declined in North Dakota since 1960. The current relationship between reserves and production may be seen more easily in the following tabulation. Data are in millions of barrels.

	Production during 1961	Proved reserves at end of 1961	Ratio of reserves to current production
Montana	31	251	8.2
North Dakota	24	413	17.5
United States	2,512	31,759	12.6

The reserve situation is not actually as serious as the ratio column would indicate, since it makes no allowance for production under secondary recovery methods or for the fact that proved reserves have rather consistently been revised in an upward direction. Setting aside these adjustment factors, however, the data show that, in the absence of any new discoveries or reliance on imported crude oil, the life of the petroleum industry in Montana and North Dakota is 8.2 years and 17.5 years, respectively.

These figures reveal why genuine concern has arisen about the decline in exploration and drilling in the two states. The reason for this decline which is given major emphasis by independent producers is the excessive supply of domestic and imported crude and the concomitant failure of crude oil prices to move up with drilling and other costs. The solution which they espouse is to cut back imports, which currently amount to about 13 percent of the new supply of petroleum in the U. S., to the 1956, pre-Suez level.

Ninth district producers are more concerned about Canadian than overseas imports, because overland imports are exempt from quota limitations and because these imports have almost doubled in the past two years. More specifically, they are concerned because most Canadian oil comes into the midwest portion of the U. S., where it competes particularly with North Dakota crude. They argue that Canada should be persuaded to import less overseas crude into their eastern provinces and thereby be less pressured to sell Prairie Province crude in the U. S. The exemption of Canadian imports from quota limitations, however, was based on a continental defense policy and the assumption that Canadian oil would be available equally with that of the U. S. in event of an emergency.

With respect to the more general question of increased restrictions on overseas imports, the principal argument offered by the independent producers is that reduced imports would best serve our defense needs. The defense argument assumes, in the event of a major war, that we would be cut off from overseas imports (including those from Venezuela) and that the current level of domestic oil production would not be adequate. Therefore, it is argued that imports should be curtailed even more in order to increase exploration and to have available a larger known reserve of oil.

The defense argument is to a large extent based on the assumption that the next war will be like

World War II. In the age of the hydrogen bomb and intercontinental missiles, an unlimited war is likely to be short and devastating and is not likely to require large and sustained supplies of petroleum. Military planning does recognize the possibility that there may be a longer, drawn-out aspect of such a war for which some stockpiling is necessary. However, if massive movements of troops and supplies are necessary and possible it seems probable that supply lines through the Caribbean can be kept open. If this should prove to be impossible, reliance would need to be placed on the vast increase in production that could be obtained from existing wells if they were allowed to produce at their maximum efficient rate. World War II experience also indicated the extent to which production can be diverted from non-essential civilian to military use.

Instead of being unlimited, a future war may, like the Korean War, be limited in its theater of operations or in its application of weapons. This kind of war will not require a major war effort on the part of the U. S., and main reliance will be placed in the use of ready forces. Under conditions of a limited war it is also likely that the channels of international trade will remain open except for the areas involved in combat. It is particularly unlikely that the U. S. would be cut off from its sources of Venezuelan crude. In view of the probable nature of either an unlimited or a limited war, it is doubtful that a marked increase in the domestic supply of crude would be required. Hence national defense provides a questionable basis for tightening up on import quotas.

Stripped of the defense argument the case for more effective quotas has little economic justification. It is not an efficient use of resources to spend $1.75 to find and produce a barrel of oil in the U. S., when oil can be found and produced in the Middle East for about 50 cents per barrel and transported to the U. S. for about another 40 cents per barrel. In view of this cost disadvantage, it is more efficient to import crude oil and divert labor, steel and other resources in the U. S. into the production of items in which we have a cost advantage or, at least, less of a cost disadvantage.

The most recent argument for further restrictions on overseas imports of oil is that the current level of imports (about 1.8 million barrels per day) constitutes a substantial demand for foreign exchange. It is pointed out that our adverse balance-of-payments situation could be relieved if imports were reduced. However, it should be remembered that if foreign countries earn fewer dollars as a result of American import barriers, they will, in the long run, buy fewer American exports. Moreover, they may retaliate by increasing their import restrictions against American goods. Hence, increased restrictions would not be likely to improve even our goods and services account, to say nothing of our capital account.

It should also be pointed out that dividends, profits and interest on direct investment by American companies in foreign oil currently amount to over one billion dollars annually. To the extent that these foreign earnings can be repatriated, they constitute a significant offset to the exchange used in crude oil purchases. There is also another respect in which crude oil imports have a beneficial effect on the U. S. balance-of-payments position. That position depends to a great extent upon the ability of American producers to compete successfully with European and other counterparts. To the extent that oil imports keep down energy costs for American producers, their competitive position is protected.

These considerations and others indicate how inextricably the oil import and oil price situation is bound up with broad considerations of national interest. Regardless of how influential imports may be on the level of crude oil prices and on the level of drilling activity in the district, the issue presumably will be decided in Congress on the basis of the national interest.

Although the prospects for immediate resumption of large scale drilling do not seem good, there are several bases for confidence that drilling will ultimately be resumed and that new reserves

will be found in the Williston Basin and other basins farther west in Montana. It is significant that major oil companies are continuing to hold large blocks of leased land in the Basin. Leases given up usually have been acquired by other major companies. These reserves are so large that they are not likely to be exhausted within a decade or so. When they are, however, or when other forces make domestic crude more valuable, it is probable that these companies will resume domestic seismograph and drilling work.

A factor which makes this longer term prospect likely is the confidence which most geologists have in the existence of substantial additional oil reserves in the western two-thirds of the district. According to knowledgeable geologists, the most promising exploration in Montana involves drilling in the Montana portion of the Powder River Basin, deep drilling along the Rocky Mountain front, and deeper drilling along the west side of the Williston Basin and in the Sweetgrass Arch. In North Dakota, except for deep drilling in the Nesson Anticline area, there has been very little drilling to formations of pre-Mississippian age. However, in 1961, six successful wildcats were drilled in formations of Devonian age at the 11,000 foot level. Most geologists believe that substantial amounts of oil exist at these levels or in deeper formations in the central part of the Williston Basin. At the present time the probable existence of this oil is considered as a "reserve" by the major companies retaining their leases in the area. When the need for crude becomes more acute there is likely to be a resumption of drilling and a prolongation of the life of the industry in the region.

Current conditions . . .

The upward trend in the district economy during September and October continued somewhat stronger than the national rate. District economic indicators revealed a mixed trend, some pointing up and some down as in the national economy; but more of them were recorded on the strong side.

An important source of strength in recent months has come from the farm sector. While farm incomes usually rise at this time of year,

with farmers marketing their grain and livestock, the increase has been markedly greater than a year ago over large areas of the district. The higher farm income is the result of this year's near record crop output and of higher prices received for livestock and livestock products. Although lower grain prices prevail throughout the district, they have been more than offset by higher prices for other products.

District retail sales in September and in the first half of October were at a lower level than in the nation, but by mid-month evidence pointed to the beginning of a rise in volume. Department and general store sales in September were 1 percent above the year earlier volume. The seasonally adjusted index of department store sales was up 2 percent from a year ago, down 1 percent from August and down 5 percent from the peak of last April. The first two weeks of October showed department store sales in the Twin Cities and in Duluth and Superior, up 2 percent from a year ago. New car registration in the Twin Cities metropolitan area was down in September, in comparison with the number a year earlier, due mainly to the limited supply of some 1962 models before the introduction of 1963 models.

Retail store executives in most areas of the district are optimistic about the current outlook. Some retail chains, with outlets largely in this region, had record sales in September and anticipated a high volume during the entire fourth quarter. The rise in sales observed this fall is attributed especially to the improvement in farm income and to larger payrolls in manufacturing centers.

Department store sales in the U. S. during September were up 6 percent from a year ago, up 2 percent from August and equal to the high reached last March. Total retail sales, seasonally adjusted, declined 1 percent in September from August, reflecting a further decrease at durable goods stores, particularly in the sale of new cars temporarily in short supply.

District nonfarm employment from the first of the year through October rose slightly more than seasonally. The total number of wage and salary workers was up 2 percent in September and, according to preliminary estimates, up 2 percent in October from a year ago. Further evidence of improvement in the employment picture is the decline in the number of workers receiving unemployment insurance. The number in the district during September was down 41 percent, compared with the total a year ago; the filing of initial claims was down nearly 4 percent.

An exception to the moderate expansion in economic activity is found in the iron ore mining regions. Contrary to the usual trend, employment and payrolls began to decline in August. The tonnage shipped in August was down 11 percent and in September, 18 percent, compared with 1961 shipments. However, the tonnage shipped during the current season at the end of September was still 10 percent above last year.

The outlook now is for an early closing of the Great Lakes shipping season. Stocks of ore at steel mills in mid-October were sufficient to carry the mills through the winter months. As it has become evident that orders for steel are not rising as fast as anticipated, projects to prepare ore bodies for mining in 1963 have been scaled down. Consequently, employment and payrolls in the iron ore mining regions may reach a relatively low level in the approaching winter months.

District adjusted personal income for September was up slightly, 0.4 percent, from the previous month. The increase was entirely in the farm sector. For the first time in eight months, U. S. personal income did not rise in September.

The following selected topics describe particular aspects of the district's current economic scene:

FARM INCOME MOVES UPWARD

Farm incomes in the Ninth district show considerable improvement as farmers move grain and

livestock to market. After experiencing a slight advance during the first six months of this year over the same period of 1961, cash receipts from farm marketings moved ahead markedly during July and August. The increase during those two months amounted to 12 percent and 16.8 percent, respectively, over July and August of last year. Thus, cash receipts to farmers through August were running 4.8 percent ahead of those received during the first eight months of 1961. This figure compares with the 1.6 percent gain in cash receipts by all U. S. farmers.

TABLE 1—CASH RECEIPTS FROM FARM MARKETINGS, JANUARY-AUGUST

(millions of dollars)

	1961	1962	Percent change
Minnesota	933	960	+ 2.9
Montana	179	205	+14.5
North Dakota	297	338	+13.6
South Dakota	407	409	+ .6
Ninth District*	1,999	2,093	+ 4.8
United States	20,270	20,597	+ 1.6

*Includes 15 counties in Michigan and 26 counties in Wisconsin.

As shown in table 1, $67 million of the district gain of $94 million is attributable to increases in Montana and North Dakota. Recently, a significant improvement occurred in the latter state. At the end of July, cash receipts to North Dakota farmers lagged 5.4 percent behind those received during the same period of 1961. During the month of August, however, receipts were 74.3 percent higher than the receipts of August 1961, with the result that the cumulative total at the end of August was more than 13 percent ahead of last year. Much the same pattern held in Montana, although the August 1961-August 1962 figures showed a smaller, yet significant increase of 38.5 percent. Cash receipts in Minnesota and South Dakota fell off more than 5 percent during August as compared to the same month of last year. Both states, however, still maintained a slight improvement over the 1961 total.

Contributing in a large degree to the improved farm income picture is this year's crop output. Preliminary figures released by the U. S. Department of Agriculture on October 15 indicated that this year's wheat crop would run 66 percent higher than that of 1961, and 15 percent greater than the average output of the 1951-1960 period. A complete reversal from last year has occurred in North Dakota, where spring wheat and durum production figures are up 96 percent and 280 percent, respectively, from the figures for last year's drouth-stricken crop. In terms of all wheat classes, North Dakota's production is set at 161.1 million bushels, compared to 68.4 million bushels last year. All wheat production in Montana totaled 90 million bushels, up 36.4 million from last year; and South Dakota wheat production totaled 29.5 million bushels, a 10 percent reduction from last year's crop, largely due to rust damage. The South Dakota wheat crop is also 6 million bushels short of the 1951-1960 average.

TABLE 2—CROP PRODUCTION, DISTRICT STATES*

(millions of bushels)

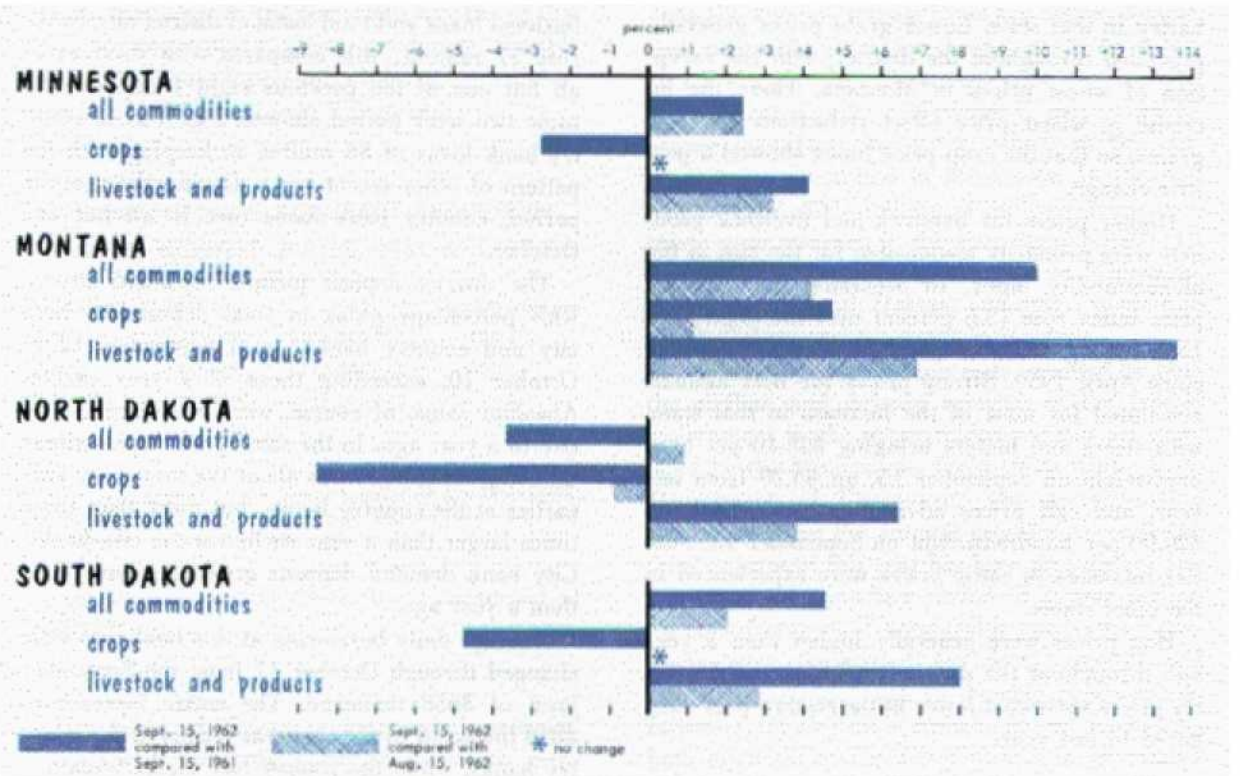
	Average 1951-60	1961	Indicated 1962	Percent change 1962 from 1951-60 avg.
All wheat	258.4	179.6	298.3	+ 15.4
Winter wheat	50.6	50.1	53.9	+ 6.5
Spring wheat	183.0	111.0	177.8	— 2.8
Durum	26.5	18.5	66.6	+151.3
Oats	342.4	279.6	358.6	+ 4.7
Barley	143.7	108.5	188.0	+ 30.8
Flax	32.2	19.4	30.3	— 5.9
Rye	10.1	8.8	19.7	+ 95.0
Corn	366.7	429.6	387.8	+ 5.6
Soybeans	43.8	61.2	49.2	+ 12.3

*Includes only the four full states.

Production of other small grains also showed decided improvement over last year's output and surpassed the 1951-1960 averages in all cases except flaxseed.

The estimated output of corn and soybeans is set below last year's figures, although both crops are

Percent change in farm prices received index — Sept. 15, 1962 compared with Sept. 15, 1961 and Aug. 15, 1962.



expected to exceed the 1951-1960 averages. In Minnesota the production of corn and soybeans is expected to reach 260.6 million bushels and 45.2 million bushels, respectively, both down more than 20 percent from last year. The corn output in South Dakota is estimated at 120 million bushels, up 20.8 percent from last year, and soybeans at 2.4 million bushels, up 8 percent.

An added feature in the South Dakota feed economy is the growing importance of sorghum grain production. The output of this crop, which is almost the equivalent of corn in many respects, is expected to total 6.6 million bushels this year, compared with an average output of 3 million bushels over the 1951-1960 period and 4.8 million bushels last year.

Further encouragement in the farm income situation can be found in the general level of commodity prices received by farmers. The chart shows that the index of prices received for all commodities on September 15, 1962, has advanced in each of the district states, except North Dakota, over the index level on the same date last year and a month earlier this year. That the index was 4 percent lower than last year in North Dakota can be explained by a drop in the price of most grains from last year's drouth-induced price levels. For example, the average price paid to farm-

ers for durum was $3.05 per bushel on September 15, 1961, and $2.20 on the same date this year. Other price reductions occurred in oats, rye and barley in that state. Lower grain prices generally prevailed throughout the district, with the exception of wheat prices in Montana. There the increase in wheat price offset reductions in other grains, so that the crop price index showed a positive change.

Higher prices for livestock and livestock products were primarily responsible for the rise in the all-commodity index. In Montana, the livestock price index rose 13.6 percent over the September 15, 1961 figure, the highest level for any month since April 1959. Strong prices for beef animals accounted for most of the increase in that state, with steers and heifers bringing $25.10 per hundredweight on September 15, up $3.20 from last year, and calf prices advancing $3.60, to reach $29.90 per hundredweight on September 15. Similar increases in cattle prices were experienced in the other states.

Hog prices were generally higher than a year ago throughout the district, with dairy and poultry prices somewhat lower in the eastern part compared to last year.

DISTRICT BANKING DEVELOPMENTS

District member banks showed a very strong loan picture in September. The city bank gain of $43 million was the largest absolute increase for September in the postwar period and the largest percentage increase since 1950. In contrast to the $16 million August addition to total loans which was all in business loans, the September gain included $17 million loans to brokers and dealers, $9 million loans to nonbank financial institutions and $13 million in the other loans category.

At country banks, the September loan increase of $25 million was larger than the absolute gain for that month in all postwar years except 1955, when plus $26 million was registered. The percentage gain was the largest since 1956.

In the first two weeks of the October period, business loans and total loans of district city banks rose $1 million; this compares with declines in all but one of the previous eight Octobers. The same two week period showed a growth in country bank loans of $8 million in keeping with the pattern of other recent years. During the postwar period, country bank loans rose in all but one October.

The district deposit picture remained strong, with percentage gains in total deposits at both city and country banks, from September 12 to October 10, exceeding those of a year earlier. Absolute gains, of course, were even larger relative to a year ago. In the same period, percentage time deposit growth was about the same as a year earlier at the country banks, but more than three times larger than a year earlier at the city banks. City bank demand deposits grew at a lesser rate than a year ago.

Average daily borrowing at this bank was little changed through October 17 from the September level of $658 thousand. The entire increase to $853 thousand in October was lodged at the country banks, while the reserve city banks remained out of debt, as they had in September.

FEDERAL GOVERNMENT PROCUREMENT IS UP

District manufacture of durable products has expanded significantly since the first of the year. An important factor in the larger demand has been the value of contracts awarded by both civilian and defense agencies of the federal government.

The seasonally adjusted index of industrial use of electric power, an indicator of manufactured products output in the district, was up in August almost 7½ percent above the January figure; most of the increase occurred in the output of durable products. As seasonally adjusted indexes on

employment in durable and nondurable manufacturing are not available, the growth in employment can only be measured by the percent increase from a year ago. In the first eight months of this year, employment in plants producing durable products was up 7 percent, while in the nondurable plants, it was up only 2 percent.

GOVERNMENT PRIME CONTRACT AWARDS IN THE UPPER MIDWEST STATES, 1961 AND 1962*

Quarters	1961	1962	Percent increase
First	$ 32,771,305	$106,955,735	226.4%
Second	73,552,927	140,075,638	90.4
Third	84,706,903	110,605,957	30.6
Fourth	156,763,398		

*The states included in the above tabulation are Minnesota, Iowa, Wisconsin, North and South Dakota, Montana and the Upper Peninsula of Michigan.

Source: Minneapolis Field Office, U. S. Department of Commerce.

The value of federal governmental agencies' prime contract awards, compiled by states, gives only an approximate indication of the state in which actual production work is done. For the majority of the contracts awarded to manufacturers, the tabulations reflect the location of the plant where the product is finally processed and assembled. Construction contracts are compiled by the states where the construction is to be performed. However, for some contracts with large companies having more than one plant, and for contracts with service, wholesale or other distribution firms, the allocation among states is made according to the address of the contractor's main office.

In the four district states — Minnesota, Montana, North Dakota and South Dakota — the military prime contracts awarded aggregated $479 million in 1961. About 20 percent of these contracts were awarded in each of the states of Montana, North Dakota and South Dakota, and 40 percent were awarded in Minnesota.

As the work on missile bases has neared completion, contract awards for these projects have fallen off sharply. In the current year, the contract awards again are concentrated more heavily among manufacturing firms, which in this district, are concentrated in Minnesota. In the first half of 1962, $283 million of military prime contracts were awarded in the four district states. Of this total, 73 percent was awarded in Minnesota, 14 percent in South Dakota, and only 7 percent in North Dakota and 6 percent in Montana.

The amount of prime contracts awarded by both the civilian and defense agencies of the federal government in the upper midwest states are compiled by the Minneapolis Field Office of the U. S. Department of Commerce. The accompanying table shows that the amount awarded through the third quarter of this year has been up substantially from the corresponding period of a year earlier. To manufacturers of nondurable goods, most contracts were designated for food, apparel and chemical products, and to durable goods manufacturers, for electronic equipment and machinery, both electrical and nonelectrical. A large number of construction contracts were awarded for a wide variety of projects, including river improvement, in the upper midwest states.

The rise in the dollar amount of contracts awarded reflects the steady increase in federal government expenditures. During the second quarter of this year, the seasonally adjusted annual rate was $62.1 billion as compared with $55.4 billion for the first quarter of 1961.

The dollar amount of contracts awarded in this region as a proportion of the total has remained quite stable from the beginning of the Korean War to the present time. Military prime contracts awarded in the four district states in 1961 and in the first half of this year have been slightly less than 2 percent of the U.S. total. The proportion of both civilian and military contracts has averaged

somewhat less, 1.3 percent of the total. Including all of Michigan and Wisconsin, though only parts of these states are in the Ninth district, the dollar amount of military contracts has been close to 5½ percent of the total, and for both civilian and military contracts, about 5 percent. The large manufacturing complex, both on Michigan's lower peninsula and in southern Wisconsin, obviously assures the awarding of a relatively large amount of contracts in those areas.

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