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North Dakota Communities Acutely Impacted by Oil and Gas Development: Watford City Housing Demand Analysis

**Final Report
December 20, 2010**

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Study timeframe August—December 2010

North Dakota Communities Acutely Impacted by Oil and Gas Development

Introduction

Purpose

North Dakota Communities Acutely Impacted by Oil and Gas Development: Housing Demand Analysis is a large-scale research project conducted to inform decision-makers about housing needs given the magnitude, trajectory, and sustainability of oil and gas development in northwest North Dakota. As such, the study has many stakeholders and given the evolving nature of the Bakken and Three Forks “plays” the report authors have had to reconcile many facts and opinions in order to develop models that best reflect reality and model likely futures. Nonetheless, the purpose of the study is to document and demonstrate permanent ongoing housing needs in the northwest North Dakota communities of Parshall, New Town, Stanley, Tioga, Watford City, and Williston for the next 20 years at five-year intervals.

Study Delimitations

Delimitations are the boundaries that confine the study’s extent in time, space, and subject matter. *North Dakota Communities Acutely Impacted by Oil and Gas Development: Housing Demand Analysis* is restricted to northwest North Dakota in particular the North Dakota Bakken/Three Forks footprint. An understanding of the extent of this footprint was derived from a *Bakken Drilling/Spacing and Well Spot Basemap* issued by the Oil and Gas Division of North Dakota’s Department of Mineral Resources in mid-November, 2010.

While a number of oil and gas impacted cities in northwest North Dakota were invited to join the study, the study was capped at six cities. The participating cities are Parshall, New Town, Stanley, Tioga, Watford City, and Williston. Furthermore, the study’s boundaries were fixed at these cities’ current city limits.

The study’s time frame was set to cover a 20-year span (2010 to 2030) featuring snapshots at five-year increments—2010, 2015, 2020, 2025 and 2030. The populations reported for the six cities are forecasted population potentials based on oil and gas drilling and production. Housing needs are determined for permanent ongoing population rather than short-term housing needs for transient workers.

Study Limitations

Limitations are weaknesses and this study has several. First, this study was completed in a short time window. Data collection, analysis, and report generation occurred between September and December, 2010. Second, the Bakken//Three Forks oil and gas play is very dynamic and its potential is not yet fully known. Third, one of the documents necessary to complete the study, an oil and gas occupation and employment study was late. Fourth, this study’s population forecasts assume all of the six study cities can absorb their

proportionate population potential. Fifth, the study does not include current or future temporary and permanent population increases from infrastructure construction projects, oil and gas construction projects, development of other industries, or development of other mineral formations.

Methodology

While the study's time dimension extends from 2010 to 2030, the actual study was more complex. Given that the 2010 census has not been released, it was necessary to determine a baseline 2010 population and demographic profile for each of the six study cities. The derived 2010 population baseline is in effect a count of each city's housing and includes those living in temporary quarters and those living in permanent housing. This baseline served as a performance milestone reported in an interim report circulated October 18, 2010.

The next challenge was to develop an understanding of Bakken/Three Forks oil and gas drilling, production, extent (footprint), duration, and lifecycle. While determining each city's 2010 population relied on visits, phone calls, and data requests to many individual informants across northwest North Dakota, this part of the study depended on gathering expert opinions from a small number of highly placed state and industry informants. Since industry estimates of the Bakken/Three Forks potential are so diverse, information supplied by Mr. Lynn Helms, Director of North Dakota's Oil and Gas Division, Department of Mineral Resources was used as the primary source to build a model of oil and gas development-driven population growth. This model was first derived for the entire Bakken/Three Forks footprint and recognizes permanent employment from primary, secondary, and induced sources. (Induced employment is employment needed to supply services to the primary and secondary sectors. Induced employment has been referred to as "the butchers, bakers, and candlestick makers.") These permanent employees were then converted to an estimate of household population.

The Bakken/Three Forks play has distinct lifecycle phases.

- Phase One is underway now and involves drilling to secure leaseholds. According to Director Helms, this phase should be completed by 2014 with the drilling of 7,000 wells.
- Phase Two has started in some districts and is pattern drilling, that is, drilling a number of wells to best exploit the oil and gas potential of a defined acreage.
- Phase Three is the production phase and has begun for completed wells. A key characteristic of the Bakken formation is that production output is gas-driven and total fluids recovered decline rapidly after the first years of production.

Phase Two pattern drilling information supplied by Director Helms spanned an upper and lower bound of 28,000 pattern wells to 14,000 pattern wells. To refine this spread three population scenarios were developed, one based on a Bakken/Three Forks expected pattern drilling of 21,000 wells as well as a pessimistic 14,000 wells and the optimistic 28,000 wells.

Total Phase One and Phase Two wells are a pessimistic 21,000 total wells (7,000 Phase One wells plus 14,000 Phase Two wells), an expected 28,000 total wells (7,000 Phase One wells plus 21,000 Phase Two wells), and an optimistic 35,000 total wells (7,000 Phase One wells plus 28,000 Phase Two wells).

The lifecycle phases, declining fluid production, and three pattern drilling options were incorporated into a unified model and population potentials for each of the six cities were determined. This is the brief report circulated December 6, 2010.

Again, population potentials are expected city populations if new comers can be accommodated. If a community falters and cannot provide housing, its share will live in those communities that can.

The final challenge was to allocate each city's population potential based on permanent employment projected at five-year intervals across key housing-related variables. These include the following.

- Housing projections by tenure and by type. (Tenure refers to renting versus owning and type includes single family, multi-family, and mobile homes. It is assumed that each city's housing tenure and type will normalize to pre-Bakken/Three Forks conditions. That is, while a city may in 2010 have a higher percentage of mobile homes than in 2000, by 2030 the percentage of mobile homes will be similar to what the city hosted in 2000.)
- Population by age cohort. (Population by age cohort reports cohorts in five-year increments and was derived by aging the current population, adding new comers at a ratio of 25 percent in cohorts 40 years and older and 75 percent to cohorts spanning zero to 39 years. Finally cohort increases and decreases were figured by applying North Dakota birth and mortality rates.)
- Households by age. (Households by age was determined using information developed in the first two variables described above to allocate householders to three age categories –young householders, 15 to 39 years of age; middle years householders, 40 to 64 years of age; and retired householders, 65 years and older— to three tenure categories owner, renter, and total households.)
- Household income by percent. (Known household median incomes and poverty rates for 2000 and 2010 anchored projections of future poverty rates and median incomes. Here it is assumed that over time poverty rates will fall to Mercer County, ND's current level (7.2 percent) since Mercer County reflects a mature extractive industrial base. It is assumed that median incomes and poverty thresholds will rise with the consumer price index (CPI). Median incomes should stabilize as less overtime will be paid as the oil and gas industry normalizes.)
- Household income by number of households. (This representation converts household income by percent to the number of households in particular income categories.)
- Households by affordable rent/mortgage. (This representation reports the level of rent affordable by the number of households in income categories. It assumes affordable rent and an affordable mortgage is 30 percent of household income.)

- Households by size. (Households by size report the number of individuals living in a household. These households were allocated across renter households and owner households.)

In addition, a model estimating new construction rental rates was generated. This model estimates the rental rates needed to pay back a multi-family apartment building in five, ten, 15, 20, and 25 years and is intended to provide an understanding of market-rate rent and investor time horizons.

Overall Findings for the Bakken/Three Forks Footprint

It is an exciting time to live in northwest North Dakota. Jobs are readily available and the population is growing rapidly. Newcomers are younger than the region's typical resident and the population mix is changing. In future years more attention will be commanded by the needs of younger households rather than older households. For example, school-aged cohorts will increase strongly. Since the 2000 census, median household incomes have zoomed and rates of poverty have dropped dramatically.

Since the 2000 census, over 23,000 people have been attracted to northwest North Dakota. While this is favorable given the region's long history of population decline, it is important to understand the region 20 years into the future so that over building does not occur. Given the three pattern drilling options (14,000, 21,000 and 28,000 wells), at 2030, the permanent population of the Bakken/Three Forks footprint would be approximately 92,500, 106,000, or 128,500 people respectively. However this permanent population is similar to that of the Bakken/Three Forks footprint attained at 2018.

The rig-related transient population of the Bakken/Three Forks footprint will be significantly higher. Rig-related transients (including, direct, secondary, and induced workers) add approximately 6,250 people to the overall Bakken/Three Forks footprint before leaving with the end of pattern drilling.

The buildup and relative decline of population presents challenges and opportunities across northwest North Dakota. While a stable core of housing is needed to house the region's ongoing permanent population, a large population will need decent housing all during Phase Two. Second, infrastructure and services needs to be funded at levels that service not only the region's ongoing permanent population but meet the needs of the large permanent and transient population experienced before pattern drilling ends.

Creative housing solutions of all types are needed. Crew camps providing controlled, safe, decent, and all-weather housing must be encouraged. Semi-permanent housing solutions are a must. Permanent housing that conforms to the oil and gas lifecycle should be pursued.

Given 2010 construction costs, market rate rents for new two-bedroom apartments easily top \$1200.00. Since little construction has occurred in prior decades and the large demand associated with Phase Two pattern drilling and construction projects, apartment rents

will remain high. Affordability is an issue across the region since only about half of the region's households can afford new market rate housing.

North Dakota decision makers need to monitor oil and gas activity, infrastructure and construction projects, and other new industries, and be prepared to act depending on the scenario that unfolds. The Bakken/Three Forks is dynamic and the future is still uncertain.

Report Organization

Each city's report is organized in the following manner. An executive summary highlighting key findings and concerns is followed by a recommendation section. After the recommendation comes Appendix A, Graphs and Tables. Here data elements for the city's population, housing units, mix of housing units, householders by age cohort, households by income, housing affordability by household income, and households by size are reported. Again, these customized data tables are constructed using the expected pattern drilling value of 21,000 wells (28,000 total wells). Also included in Appendix A is a model that develops market-rate rents for new apartment construction given paybacks set at five, ten, 15, 20, and 25 years. Appendix B is the interim report used to determine the city's 2010 population. This population includes transients as well as permanent people residing within the city's boundary, rental stock and rental rate information. Appendix C includes any materials received after December 6, 2010 about the city's infrastructure needed given population potentials.

Watford City

Executive Summary

While the future is bright, if pattern drilling in the Bakken/Three Forks conforms to the expected 21,000 wells, particular measures need to be taken. That is, Watford City must plan for accommodating a sustainable population in permanent housing units and accommodating a peak population in temporary and semi-permanent housing. At 2030 the city's population and housing units are equivalent to the population and associated housing units expected in 2018. That is, Watford City's 2018 and 2030 permanent population will be approximately 2,300 people requiring about 1,150 total housing units.

The median age cohort of Watford City will fall from the 40 to 44 year age cohort at 2000 to 35 to 39 years in 2010 to 30 to 34 years at 2015 before rebounding to 35 to 39 years at 2030. The greening of Watford City has a number of implications. First, those cohorts associated with primary and secondary education (five to nine years, ten to 14 years, and 15 to 19 years) will increase by 56 percent between 2000 and 2030. Second, those 65 years and older will decline in percentage and absolute numbers from 2010 to 2030.

Watford City is a much wealthier city in 2010 than in 2000. At the 2000 census Watford City's median household income was \$29,688. By 2010 its median household income zoomed to \$48,100. While the oil and gas industry is responsible for this increase, in subsequent years it is expected that employment will normalize and less overtime will be paid. Induced employment likely pays less

than does the oil and gas industry so it is likely that the city's median will only rise with the consumer price index. Using this logic by 2030 Watford City's median household income will be just over \$61,060.

In the next years Watford City will see a dramatic decline in the rate of poverty. Nonetheless, affordability of housing will be an issue in Watford City. Applying North Dakota Housing Finance Agency's rule of thumb, a median household income of \$48,100 will allow for a suggested 30 percent rent payment of \$1,203 per month. Since so few buildings have been constructed in the city in recent years, older buildings that should command lower rents are not available and new construction costs require rents of approximately this amount to payback an apartment building's cost in 20 years. (See Appendix A.)

Recommendations

As a general recommendation, decision makers need to monitor oil and gas activity to understand the sort of drilling scenario that develops. The city must plan to accommodate its peak population with temporary and semi-permanent housing and must plan to accommodate its sustainable population with permanent housing options. Some moderate overbuilding is healthy and will trigger the removal of less desirable housing and housing types.

If possible, Watford City should control and rationalize contiguous developments by annexations and by enlarging its extra-territorial zone.

Of the small cities in this study Watford City has done the best to accommodate transient workers. However, a possibility is that Watford City will be unable to accommodate its share of new employees and these people will gravitate to those communities that can.

As it has done in the past years, Watford City needs to encourage the development of more temporary or semi-permanent housing that can be withdrawn or converted to other uses as temporary workers are no longer needed and if permanent employment falls. Thus, pressure must be placed on industry to provide crew camps that provide all-weather, safe, decent, and controlled housing for temporary construction and drilling-related employees.

A style of housing that might prove useful for oil and gas impacted cities is one designed for the oil and gas drilling/production lifecycle. Such housing might consist of attached single-story suites that initially are intended for extended-stay use. As need dictates, two of these suites could be joined as an apartment. Later as need dictates, the apartments could be sold as condos.

Currently there is little need for additional market-rate senior housing in Watford City. Watford City will need infrastructure that accommodates a younger rather than older population.

Housing affordability is an issue in Watford City. New construction is expensive and is affordable for those whose earnings are at and above the city's median income level. The city needs subsidized housing for its poor and lower income earners. Those who do not qualify for subsidized housing and do not earn incomes approaching the city's median are under extreme pressure.

Given the large budget deficits and national debt, aid from the federal government will be limited. Solutions for affordable housing must be sought at the upcoming North Dakota Legislative session since market mechanisms will fail those earning below median incomes. A possible state-level solution would be housing tax credits. Housing tax credits would be superior to a simple appropriation since the state's input is magnified. Instead of an unmatched appropriation, the state's input is foregone tax collections leveraged with private tax-payer funds paid to receive the tax credit benefit.

A final recommendation is this. *North Dakota Communities Acutely Impacted by Oil and Gas Development: Housing Demand Analysis* contains a wealth of data that can be mined by a variety of stakeholders to understand Watford City at 2010 and into the future. With this as a guide, fitting solutions can be crafted for many of the challenges facing the city.

Appendix A: Graphs and Tables



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**North Dakota Communities Acutely Impacted
by Oil and Gas Development:
Housing Demand Analysis:
Watford City Graphs and Tables**

December 20, 2010

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**North Dakota Communities Acutely Impacted
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Housing Demand Analysis**

- Purpose of study
 - To inform decision-makers about permanent housing needs given the magnitude, trajectory, and sustainability of oil and gas development in northwest ND

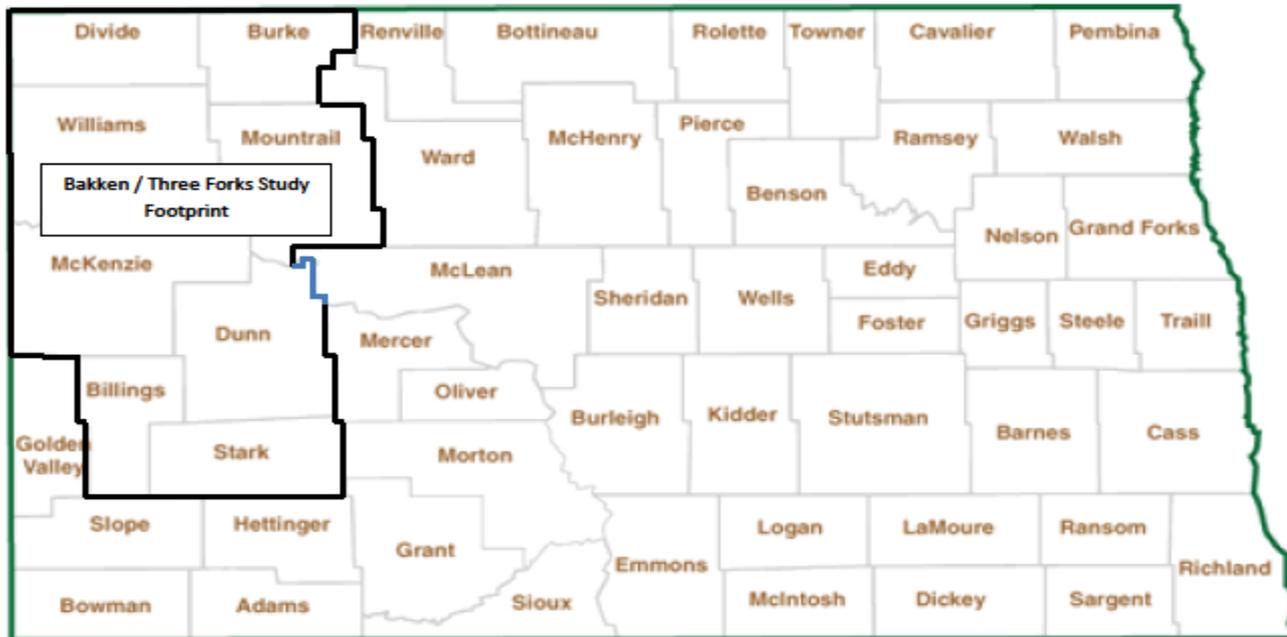
North Dakota Communities Acutely Impacted by Oil and Gas Development: Housing Demand Analysis

- Study boundaries
 - Northwest North Dakota
 - ND Bakken/Three Forks footprint
 - Parshall, New Town, Stanley, Tioga, Watford City, and Williston – city limits
 - Twenty year span (2010 to 2030 in five-year increments)
 - Population potentials based on drilling and production
 - Housing needs of permanent population

North Dakota Communities Acutely Impacted by Oil and Gas Development: Housing Demand Analysis

- Study limitations
 - Short time frame (Sept.-Dec. 2010)
 - Dynamic situation
 - Workforce Needs Study late
 - Population forecasts assume all cities can absorb their proportionate population potential
 - Study does not include current or future temporary and permanent population increases from
 - Infrastructure construction projects
 - Oil/gas construction projects
 - Development of other industries
 - Development of other mineral formations

North Dakota Communities Acutely Impacted by Oil and Gas Development: Housing Demand Analysis

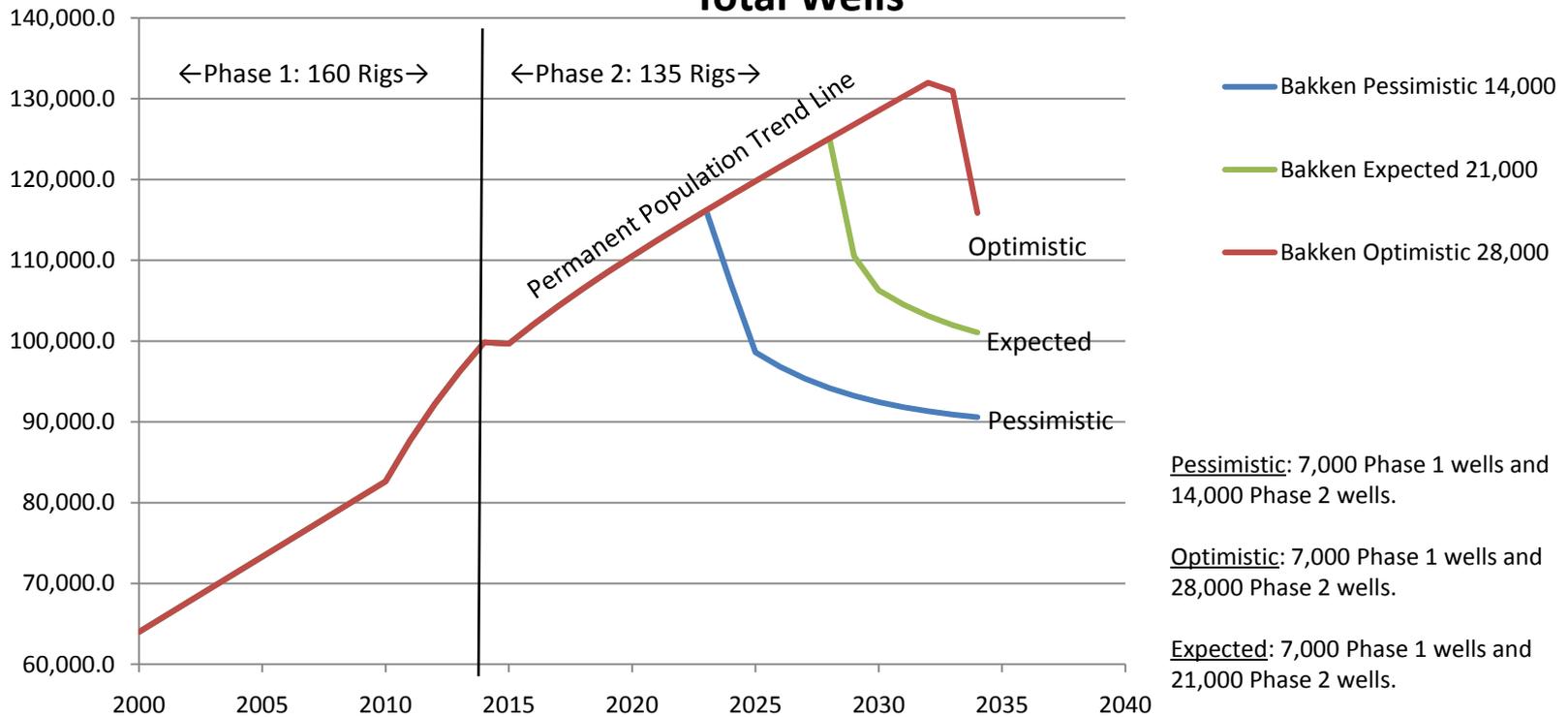


North Dakota Communities Acutely Impacted by Oil and Gas Development: Housing Demand Analysis

- Bakken/Three Forks Population Forecast Based on Total Wells
 - Phase One: 7,000 wells completed 2014
 - Phase Two: Three scenarios
 - 14,000 pattern wells completed 2024-2025 (21,000 total wells)
 - 21,000 pattern wells completed 2029-2030 (28,000 total wells)
 - 28,000 pattern wells completed 2033-2034 (35,000 total wells)
 - Production
 - Permanent population includes permanent drilling-related and production-related primary, secondary, and induced workers with households
 - Transient population includes temporary drilling-related primary, secondary, and induced populations; does not include transient construction-related impacts

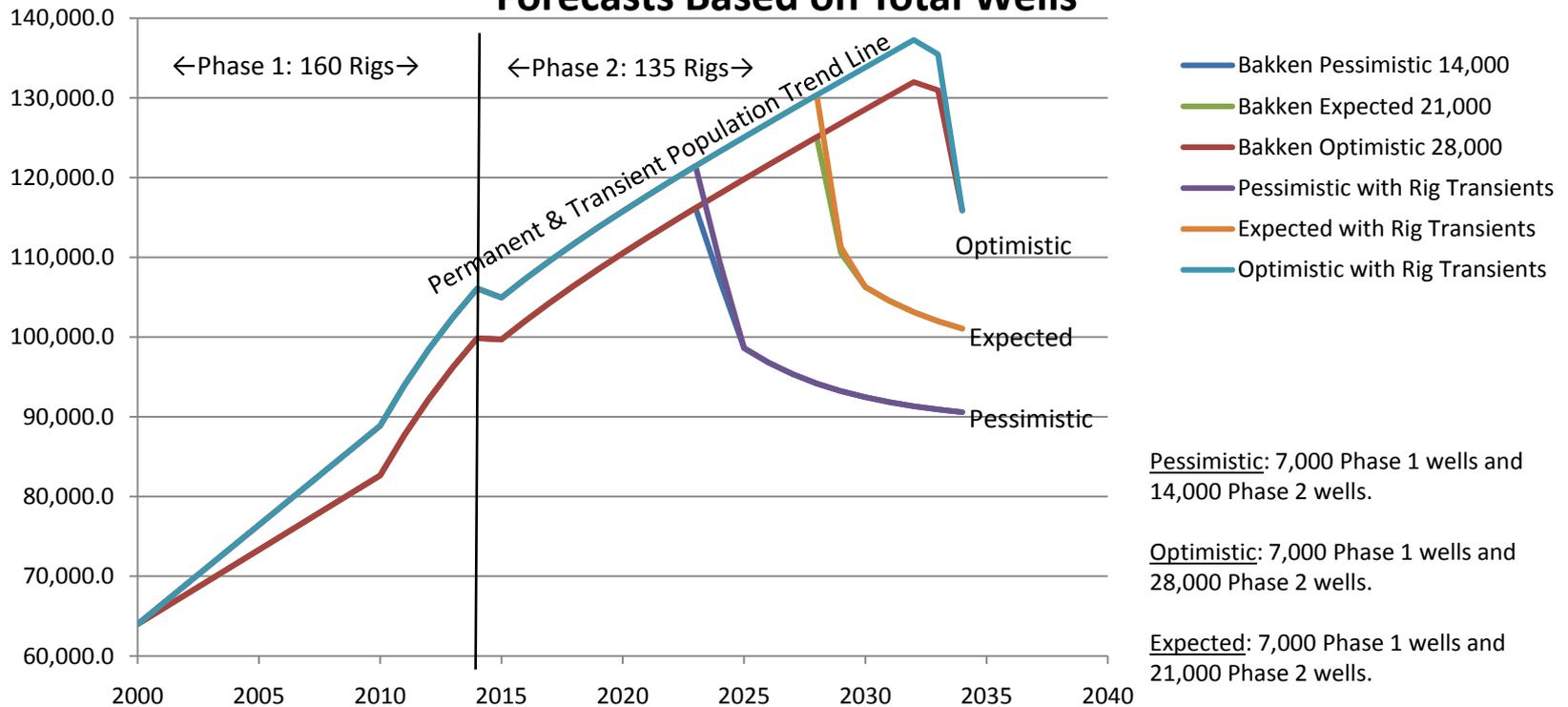
North Dakota Communities Acutely Impacted by Oil and Gas Development: Housing Demand Analysis

Bakken / Three Forks Permanent Population Forecasts Based on Total Wells



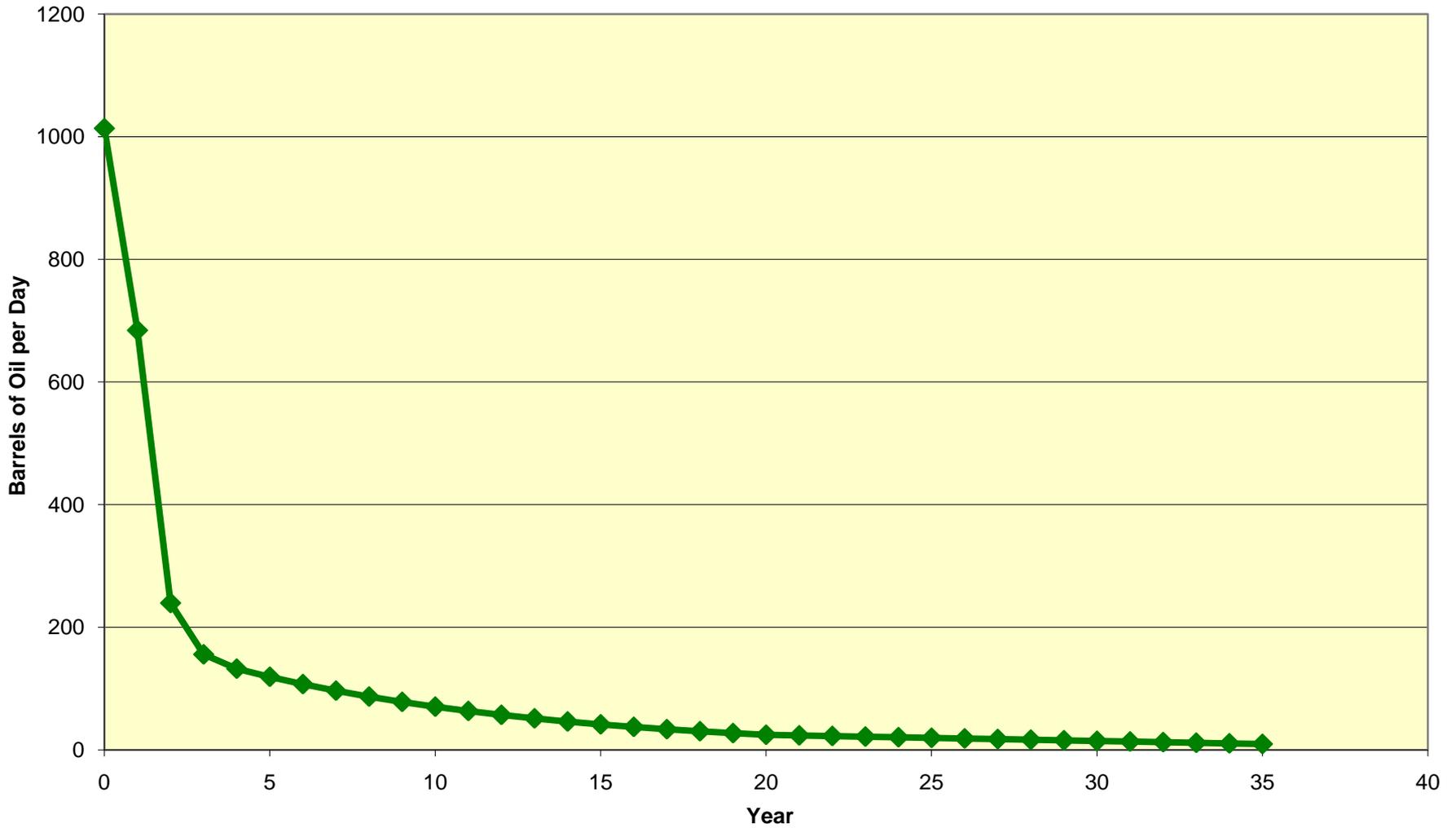
North Dakota Communities Acutely Impacted by Oil and Gas Development: Housing Demand Analysis

Bakken / Three Forks Permanent and Transient Population Forecasts Based on Total Wells



Typical Bakken Well Production

Source: Lynn Helms, ND Oil and Gas Division

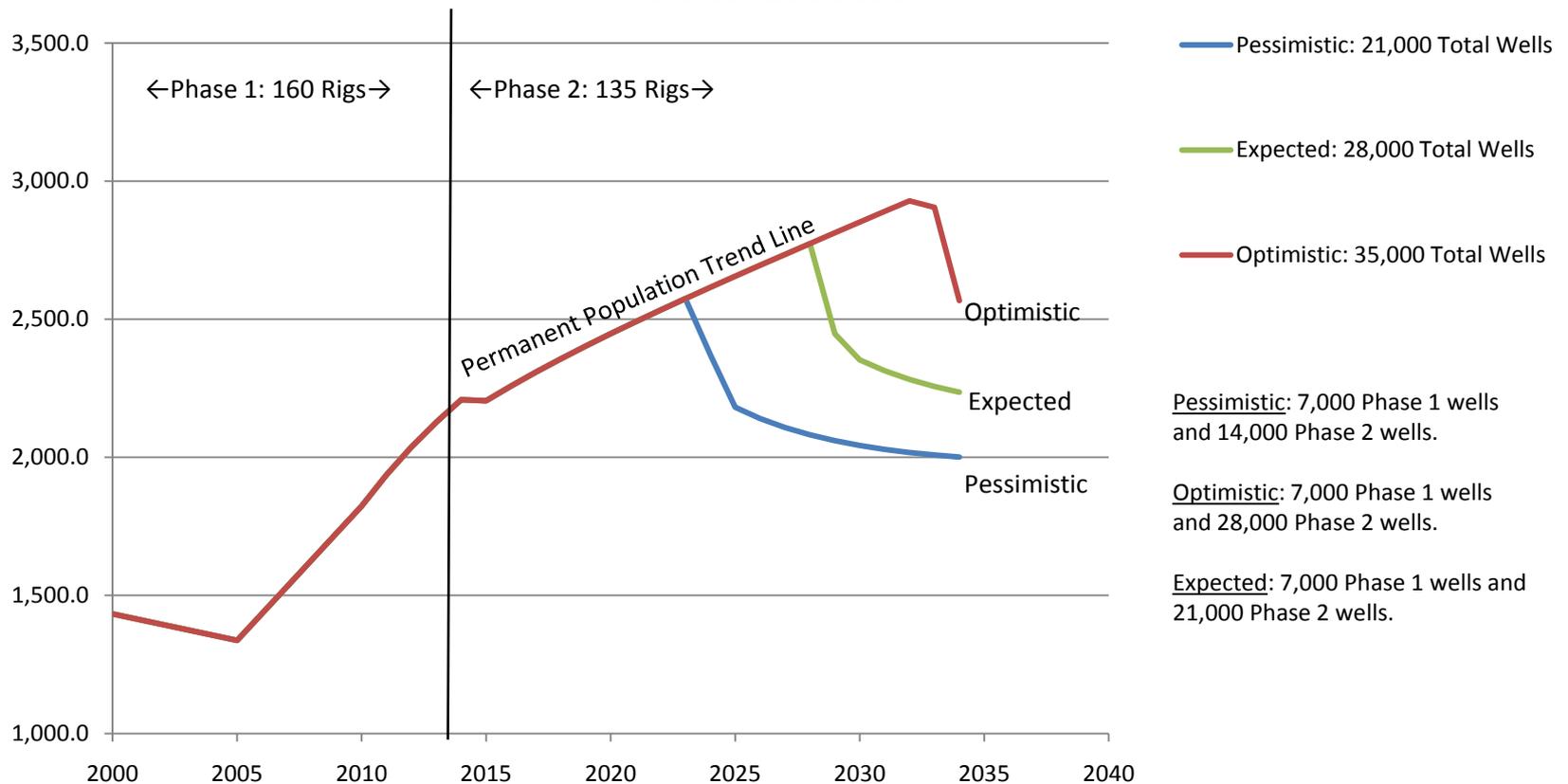


**North Dakota Communities Acutely Impacted
by Oil and Gas Development:
Housing Demand Analysis**

- **City Population Potential Based on Rigs and Wells**
 - **Watford City**
 - Allocation based on ND Bakken/Three Forks footprint population potential

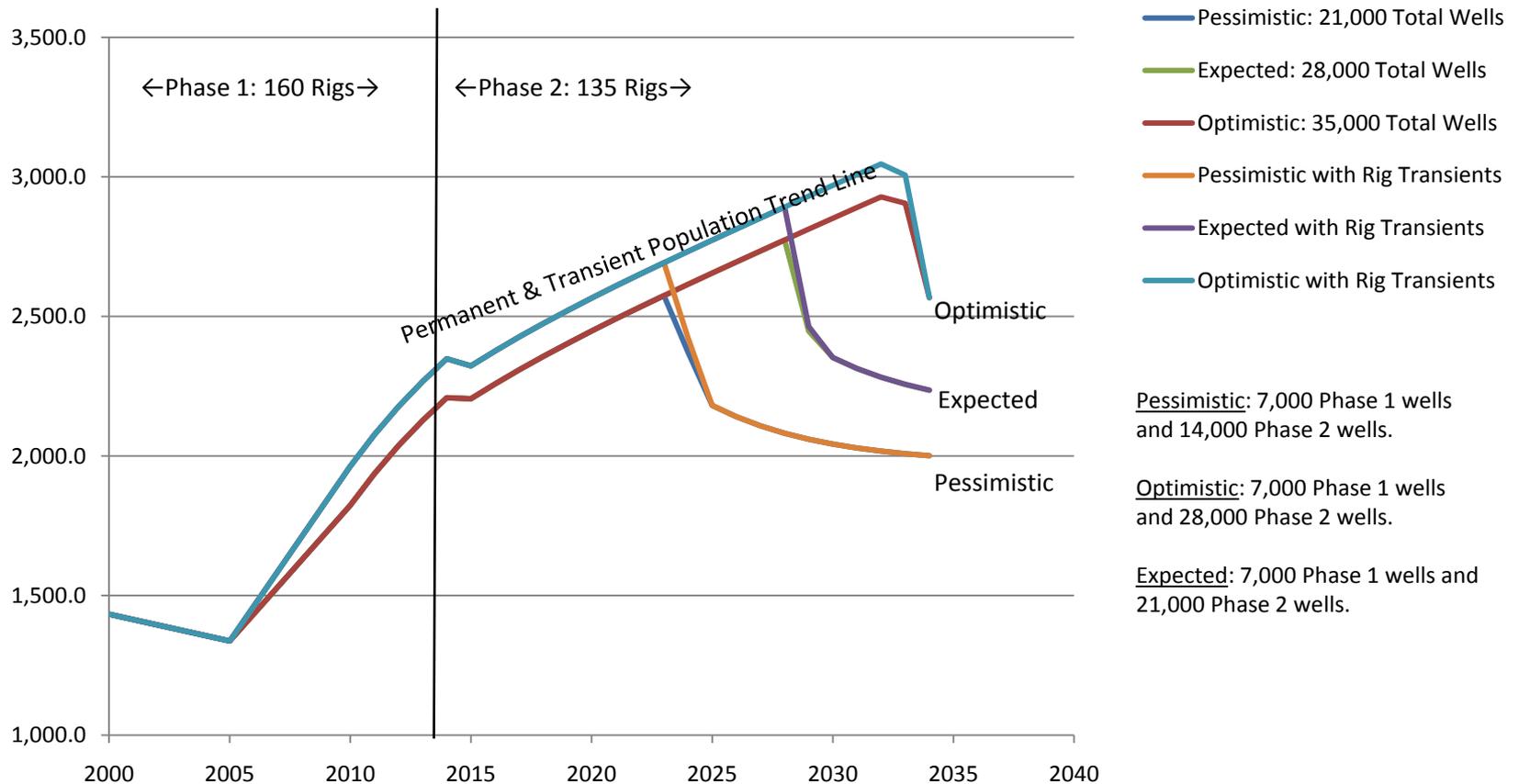
North Dakota Communities Acutely Impacted by Oil and Gas Development: Housing Demand Analysis

Watford City Permanent and Transient Population Potential Based on Total Wells



North Dakota Communities Acutely Impacted by Oil and Gas Development: Housing Demand Analysis

Watford City Permanent and Transient Population Potential Based on Total Wells



**North Dakota Communities Acutely Impacted
by Oil and Gas Development:
Housing Demand Analysis**

- Watford City permanent population proportion based on...
 - Rig count of 160 through Phase One
 - Rig count of 135 through Phase Two
 - Phase Two 21,000 expected wells
 - Production recognizes rapid decline of total fluids per well

**North Dakota Communities Acutely Impacted
by Oil and Gas Development:
Housing Demand Analysis**

- **Housing Projections by Tenure by Type**
 - Tenure (rent/own) and housing types (single family, multi-family, and mobile home)
 - Assume tenure and type will normalize to pre-Bakken/Three Forks percentages

North Dakota Communities Acutely Impacted by Oil and Gas Development: Housing Demand Analysis

Watford City Housing Projections By Tenure By Type					
	2010	2015	2020	2025	2030
Population:	1,823	2,205	2,447	2,655	2,353
Single Family Units	661	808	904	988	878
SF Owned	541	661	739	808	718
SF Rented	120	147	165	180	160
Multi Family Units	169	201	218	231	199
MF Owned	4	4	5	5	4
MF Rented	165	196	213	226	195
Mobile Home Units	56	68	76	83	74
MH Owned	49	60	68	74	65
MH Rented	7	8	9	10	9
Total Units	886	1077	1198	1302	1151
% SF Units	74.60%	75.03%	75.45%	75.87%	76.29%
% MF Units	19.07%	18.62%	18.18%	17.73%	17.28%
% MH Units	6.32%	6.35%	6.38%	6.40%	6.43%

Forecasted permanent population based on 21,000 Phase Two wells

**North Dakota Communities Acutely Impacted
by Oil and Gas Development:
Housing Demand Analysis**

- Population by Age Cohorts
 - Aged existing population cohorts
 - Added new comers
 - 75 percent 0-39 years
 - 25 percent 40 years and older
 - Applied ND birth and death rates

North Dakota Communities Acutely Impacted by Oil and Gas Development: Housing Demand Analysis

Watford City Population By Age Cohorts						
	2000	2010	2015	2020	2025	2030
Total Population:	1435	1,823	2,205	2,447	2,655	2,353
Age Cohorts						
0-5 years	66	96	167	179	188	145
5- 9 years	75	90	123	185	198	160
10-14 years	127	168	140	144	200	170
15-19 years	123	169	218	171	161	177
20-24 years	47	120	204	247	197	133
25-29 years	48	118	155	225	269	159
30-34 years	46	74	140	174	242	235
35-39 years	82	111	107	154	189	215
40-44 years	117	46	124	124	166	165
45-49 years	122	82	54	127	130	152
50-54 years	108	117	94	61	128	117
55-59 years	76	122	127	100	65	118
60-64 years	50	108	130	132	105	54
65-69 years	61	76	106	126	128	86
70-74 years	57	50	75	102	121	107
75-79 years	72	61	46	62	85	91
80-84 years	86	57	54	40	52	64
85-89 years	50	72	34	29	22	26
90 years and older	22	86	42	19	16	10
% Error		0.00%	-2.93%	-1.85%	0.24%	1.27%
Median Age Cohort:	40-44 years	35-39 years	30-34 years	30-34 years	30-34 years	35-39 years

Forecasted permanent population based on 21,000 Phase Two wells

**North Dakota Communities Acutely Impacted
by Oil and Gas Development:
Housing Demand Analysis**

- Households by Age
 - Age cohorts of householders
 - Allocated across rent/own

North Dakota Communities Acutely Impacted by Oil and Gas Development: Housing Demand Analysis

Watford City Households By Age					
	2010	2015	2020	2025	2030
Total Population:	1,823	2,205	2,447	2,655	2,353
All Households					
15-39 years	357	519	614	664	554
40-64 years	287	333	344	373	365
65 years and older	242	225	240	265	231
Total All Household Units	886	1077	1198	1302	1150
Owner Households					
15-39 years	239	350	416	452	379
40-64 years	192	225	233	254	250
65 years and older	163	151	162	181	158
Total Owner Household Units	594	726	811	887	787
Renter Households					
15-39 years	118	169	198	212	175
40-64 years	94	109	111	119	115
65 years and older	80	73	77	85	73
Total Renter Household Units	292	351	386	416	363

Forecasted permanent population based on 21,000 Phase Two wells

**North Dakota Communities Acutely Impacted
by Oil and Gas Development:
Housing Demand Analysis**

- **Household Income by Percent**
 - Began with current county-level median incomes and poverty rates
 - Assumed median incomes and poverty threshold rise with Consumer Price Index (CPI)
 - Assumed poverty will fall to Mercer Co. levels

North Dakota Communities Acutely Impacted by Oil and Gas Development: Housing Demand Analysis

Watford City Household Income by Percent						
	2000	2010	2015	2020	2025	2030
Total Population:	1435	1,823	2,205	2,447	2,655	2,353
Indexed Poverty Level:	\$12,488	\$15,080	\$16,007	\$16,990	\$18,035	\$19,143
Indexed Median:	\$29,688	\$48,100	\$51,056	\$54,194	\$57,524	\$61,060
Below Poverty	19.07%	14.40%	12.60%	10.80%	9.00%	7.20%
Poverty to \$19,999	13%	5.22%	4.24%	3.19%	2.09%	0.91%
\$20,000-\$24,999	9.67%	6.71%	6.95%	7.18%	7.43%	7.67%
\$25,000-\$29,999	8.85%	6.14%	6.36%	6.57%	6.80%	7.02%
\$30,000-\$34,999	7.21%	5.01%	5.18%	5.36%	5.54%	5.72%
\$35,000-\$39,999	9.02%	6.26%	6.47%	6.70%	6.92%	7.15%
\$40,000-\$44,999	5.41%	3.75%	3.88%	4.02%	4.15%	4.29%
\$45,000-\$49,999	3.61%	2.50%	2.59%	2.68%	2.77%	2.86%
\$50,000-\$54,999	5.25%	10.74%	11.11%	11.49%	11.88%	12.28%
\$55,000-\$74,999	7.54%	15.44%	15.97%	16.52%	17.08%	17.65%
\$75,000-\$99,999	7.38%	15.10%	15.62%	16.16%	16.70%	17.26%
\$100,000-\$124,999	1.15%	2.35%	2.43%	2.51%	2.60%	2.69%
\$125,000-\$149,999	1.15%	2.35%	2.43%	2.51%	2.60%	2.69%
\$150,000-\$199,999	1.15%	2.35%	2.43%	2.51%	2.60%	2.69%
\$200,000 or more	0.82%	1.68%	1.74%	1.80%	1.86%	1.92%
Total %	100%	100%	100%	100%	100%	100%

Forecasted permanent population based on 21,000 Phase Two wells

**North Dakota Communities Acutely Impacted
by Oil and Gas Development:
Housing Demand Analysis**

- **Household Income by Number of Households**
 - Applied percentages of household income to number of household to determine number of households at particular income categories

North Dakota Communities Acutely Impacted by Oil and Gas Development: Housing Demand Analysis

Watford City Household Income by Number of Households					
	2010	2015	2020	2025	2030
Total Population:	1,823	2,205	2,447	2,655	2,353
Below Poverty	128	136	129	117	83
Poverty to \$19,999	46	46	38	27	10
\$20,000-\$24,999	59	75	86	97	88
\$25,000-\$29,999	54	68	79	88	81
\$30,000-\$34,999	44	56	64	72	66
\$35,000-\$39,999	55	70	80	90	82
\$40,000-\$44,999	33	42	48	54	49
\$45,000-\$49,999	22	28	32	36	33
\$50,000-\$54,999	95	120	138	155	141
\$55,000-\$74,999	137	172	198	222	203
\$75,000-\$99,999	134	168	194	217	199
\$100,000-\$124,999	21	26	30	34	31
\$125,000-\$149,999	21	26	30	34	31
\$150,000-\$199,999	21	26	30	34	31
\$200,000 or more	15	19	22	24	22
Total Households:	886	1077	1199	1302	1152

Forecasted permanent population based on 21,000 Phase Two wells

**North Dakota Communities Acutely Impacted
by Oil and Gas Development:
Housing Demand Analysis**

- **Households by Affordable Rent/Mortgages**
 - Number of households in each income category and affordable rent/mortgage
 - Affordable rent 30% of income; affordable mortgage assumed to be same

North Dakota Communities Acutely Impacted by Oil and Gas Development: Housing Demand Analysis

Watford City Households by Affordable Rent/Mortgage					
	2010	2015	2020	2025	2030
Total Population:	1,823	2,205	2,447	2,655	2,353
Affordable Rent/Mortgage (30%):					
Less than \$500	174	181	168	144	93
\$500 to \$625	59	75	86	97	88
\$625 to \$750	54	68	79	88	81
\$750 to \$875	44	56	64	72	66
\$875 to \$1000	55	70	80	90	82
\$1000 to \$1125	33	42	48	54	49
\$1125 to \$1250	22	28	32	36	33
\$1250 to \$1375	95	120	138	155	141
\$1375 to \$1875	137	172	198	222	203
\$1875 to \$2500	134	168	194	217	199
\$2500 to \$3125	21	26	30	34	31
\$3125 to \$3750	21	26	30	34	31
\$3750 to \$5000	21	26	30	34	31
Greater than \$5000	15	19	22	24	22
Total Households:	886	1077	1199	1302	1152

Forecasted permanent population based on 21,000 Phase Two wells

**North Dakota Communities Acutely Impacted
by Oil and Gas Development:
Housing Demand Analysis**

- **Model Estimating New Construction Rental Rates**
 - Rental rates necessary to pay back eight-plex built using 2010 constructions costs
 - At five, ten, 15, 20 and 25 years

North Dakota Communities Acutely Impacted by Oil and Gas Development: Housing Demand Analysis

Appendix A: Model Estimating New Construction Rental Rates (Example of an 8-plex)

Structure		Lot & Site Development	
			Enter 'land' value:
		Land:	\$40,000.00
	Enter first 2:	Grading, graveling, paving, water, sewer, storm sewer, curb, sidewalks, landscaping, and design fees (2)	
Square Feet Per Unit:	750		
Number of Units:	8		
Construction per Sq Ft: (1,4)	\$127.50		\$80,000.00
Contractor Fees (Included):	\$0.00		
Architect Fees (7%) (1,4):	\$0.00	Enter Per Unit Upgrades:	
Total Costs per Sq Ft:	\$127.50	\$10,000.00	
Grand Total Construction:	\$765,000.00	Total Lot & Improvements:	\$120,000.00

Enter APR for building loan: (4d) 6.50%

Per Unit Monthly (4)

Monthly amortization per unit (4d)	Maint Fees (4a)	Mgmt Fees (4b)	Utility Costs (4c)	Taxes (6,6a,6b)	Insurance (4f,5)	Grand Total Per Unit *
5 year payback	(2,164.51)	216.45	151.52	67.23	126.55	31.67
10 year payback	(1,256.12)	125.61	87.93	67.23	126.55	31.67
15 year payback	(963.66)	96.37	67.46	67.23	126.55	31.67
20 year payback	(824.79)	82.48	57.74	67.23	126.55	31.67
25 year payback	(746.95)	74.69	52.29	67.23	126.55	31.67
						\$2,757.91
						\$1,695.11
						\$1,352.93
						\$1,190.45
						\$1,099.37

* Per unit rental rates assume a simple break even scenario. Any developer equity position is assumed to have an ROI equal to the APR of the loan.

Sources:

- (1) Wayne Whitty - 852-4850: Construction fees \$180 per sq ft with 7% architect fees
- (2) Ryan Ackerman - 852-6363
- (3) Lon Drevecky - 837-8737 - Left message on 9/27/2010
- (4) Bruce Walker - 852-0136: Construction costs (including contractor and architect fees) are about \$127.50 per sq ft.
- (4a) Approximate Maintenance Fees: 10% of rents collected
- (4b) Approximate Management Fees: 7% of rents collected
- (4c) Approximate Fuel Costs: 9% of rents collected
- (4d) Terms are running about 6.5% for up to 25 years. Lenders do not go beyond 25 years.
- (4e) Taxes are running 1.7% to 1.8% of assessed value
- (4f) Examples: \$1857 for a 5plex (\$371 per unit per year); \$14000 for a 36plex (\$389 per unit per year)
- (5) Kim Albert: Insurance is age-dependent (newer=cheaper)
- (6) Kevin Ternes - 857-4160, Minot City Assessor: Fair Market Value runs approximately 85% to 90% of total new construction and development costs
- (6a) Assessed value is allotted a 'leeway' of 5% of market value.
- (6b) Taxes are 1.7% of assessed value.

**North Dakota Communities Acutely Impacted
by Oil and Gas Development:
Housing Demand Analysis**

- Household by Size
 - Rental and owner households allocated based on number living in household

North Dakota Communities Acutely Impacted by Oil and Gas Development: Housing Demand Analysis

Watford City Households by Size					
	2010	2015	2020	2025	2030
Population:	1,823	2,205	2,447	2,655	2,353
Total Owned Units	594	725	811	887	788
1-person household	177	216	242	264	235
2-person household	257	314	351	384	341
3-person household	83	102	114	124	110
4-person household	47	57	64	70	62
5-person household	16	20	22	24	21
6-person household	11	13	15	16	14
7-person household	3	3	4	4	4
Total Rented Units	292	351	387	416	363
1-person household	177	213	235	252	221
2-person household	44	53	58	63	55
3-person household	30	36	39	42	37
4-person household	25	30	33	36	31
5-person household	9	11	12	13	12
6-person household	2	2	2	2	2
7-person household	5	6	6	7	6
% Error:	-4.31%	-4.25%	-4.26%	-4.28%	-4.39%

Forecasted permanent population based on 21,000 Phase Two wells

North Dakota Communities Acutely Impacted by Oil and Gas Development: Housing Demand Analysis

- Caveats

- Monitor oil and gas developments to understand unfolding scenarios
- Oil and gas resources are finite. Production in the Bakken/Three Forks will end
- In northwest ND population due to oil and gas will not increase forever; there will be significant fall-offs
- New technology will affect all factors of the oil/gas industry including labor
- Rig numbers are fluid and influenced by
 - Economics
 - Politics/regulations

North Dakota Communities Acutely Impacted by Oil and Gas Development: Housing Demand Analysis

- Press inquiries should be directed to
 - Mr. Mike Anderson, Director, North Dakota Housing Finance Agency ,
Bismarck, ND, 701-328-8080, maanders@ndhfa.org
- Technical inquiries should be directed to
 - James Ondracek, Ph.D., ondracek@srt.com

Appendix B: Interim Report from October 18, 2010



North Dakota Communities Acutely Impacted by Oil and Gas Development

Watford City

Housing Interim Report: Cumulative Data and Snapshot at the end of 2010

Ondracek, Witwer, and Bertsch

October 18, 2010

Contact Information:
James Ondracek, PhD
701-838-2645
ondracek@srt.com

Total Population in 2000 and 2010

Type	2000	Chg from 2000-2010 (2)	2010
Single Family units	605	+56	661
Avg. Household Size S.F.	2.267396	(1)	2.1141936
Multi Family units	137	+32	169
Avg. Household Size M.F.	1.9100846	(1)	1.7339189
Mobile Home units	51	+5	56
Avg. Household Size M.H.	2.2969733	(1)	1.9357228
Total population in housing	1371.56		1556.4811
Group Quarters	61		61
Totals	1432.56		1617.4811
Cumulative % change from 2010			12.91%

(1) The average size of households have declined due to such factors as aging, child maturation, and other household considerations.

(2) This represents the number of additional units since 2000 (e.g. building permits, HUD data, and observations/interviews).

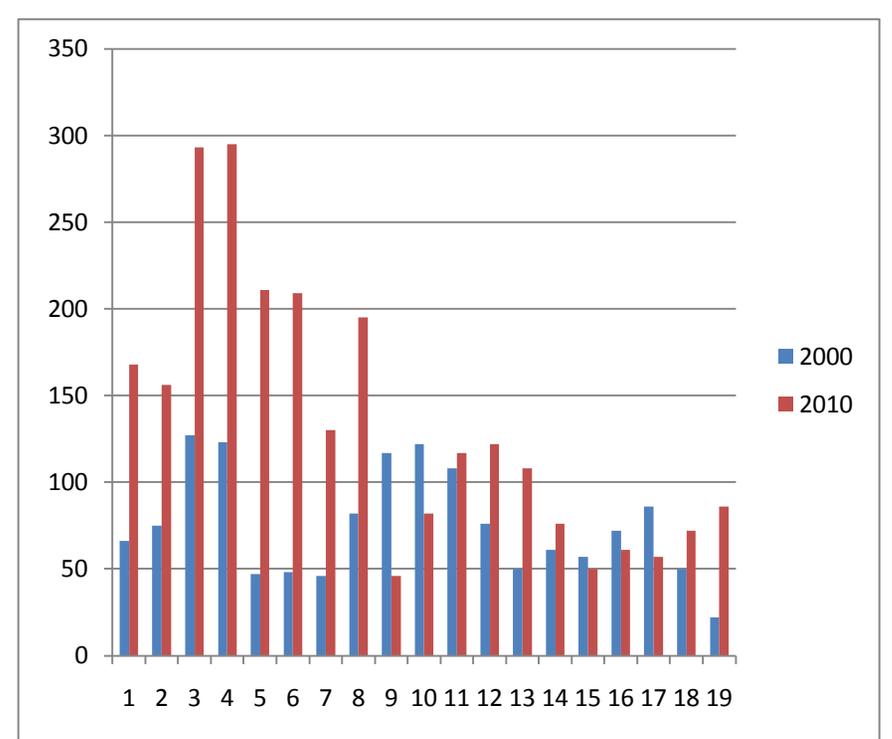
Additional Population Adjustments:				
"Double Up" @ 1% (National Avg)				16.174811
Informal RV Parking @ 1% Single Family Homes (units)				6.61
Informal RV Parking population				12.743717
RV Parks in City (2010 only).				358.59779
Motel Dwellers (2010 only).				397.15669
Skid Shacks (2010 only).				125.31643
Total population:				2527.4706
Cumulative % change from 2010				76.43%

Housing Units by Age: 2000 to 2010			
		2000	End of 2010
Median Year Built: All Owned		1964	1978.00094
Median Year Built: All Rentals		1972	1976.88835
		2000	End of 2010
Single Family % Owned		81.78%	81.78%
Single Family % Rented		18.22%	18.22%
Multi Family % Owned		2.15%	2.15%
Multi Family % Rented		97.85%	97.85%
Mobile Home % Owned		88.37%	88.37%
Mobile Home % Rented		11.63%	11.63%
Total Single Family Units		605	661
	# owned	494.77	540.569358
	# rented	110.23	120.430642
	Avg Age S.F. Owned	36	33.0347958
	Avg Age S.F. Rented	28	25.7125567
	Avg Age all S.F.	34.542	31.7007232
Total Multi Family Units		137	169
	# owned	2.9462	3.6344086
	# rented	134.05	165.365591
	Avg Age M.F. Owned	36	29.3727811
	Avg Age M.F. Rented	28	22.887574
	Avg Age all M.F.	28.172	23.0270408
Total Mobile Homes		51	56

	# owned	45.07	49.4883721
	# rented	5.9302	6.51162791
	Avg Age M.H. Owned	36	32.875
	Avg Age M.H. Rented	28	25.5892857
	Avg Age all M.H.	35.07	32.0278239

Age Cohorts at 2000 and 2010

Category	Age Cohorts	2000	% of total	2010 Shifted	2010 Adj
1	0-5 years	66	4.60%	50	168
2	5- 9 years	75	5.23%	22	156
3	10-14 years	127	8.85%	66	293
4	15-19 years	123	8.57%	75	295
5	20-24 years	47	3.28%	127	211
6	25-29 years	48	3.34%	123	209
7	30-34 years	46	3.21%	47	130
8	35-39 years	82	5.71%	48	195
9	40-44 years	117	8.15%	46	46
10	45-49 years	122	8.50%	82	82
11	50-54 years	108	7.53%	117	117
12	55-59 years	76	5.30%	122	122
13	60-64 years	50	3.48%	108	108
14	65-69 years	61	4.25%	76	76
15	70-74 years	57	3.97%	50	50
16	75-79 years	72	5.02%	61	61
17	80-84 years	86	5.99%	57	57
18	85-89 years	50	3.48%	72	72
19	90 years and older	22	1.53%	86	86
		1435		1435	2534



Error: 0.26%

By Tenure By Type at 2010

Error = 0.20%

Total		2527.470582		
Single Family Dwellers		1246.761014	Population	Units
	SF Owners		1019.607868	540.5693582
	SF Renters		227.1531453	120.4306418
Multi Family Dwellers		202.2293764		
	MF Owners		4.349018848	3.634408602
	MF Renters		197.8803576	165.3655914
Mobile Home Dwellers		112.4431759		
	MH Owners		99.368388	49.48837209
	MH Renters		13.07478789	6.511627907
Group Quarters Dwellers		61	Renters	
Double Up Dwellers		16.17481148	Renters	
1% Informal RV Dwellers		12.74371704	Renters	
RV Dwellers		358.5977866	Renters	
Motel Dwellers		397.1566884	Renters	
Skid Shack Dwellers		125.3164308	Renters	
Total Renters:		1409.097725	55.64%	
Total Owners:		1123.325275	44.36%	
Total Owned Units		593.6921389		
Total Rented SF MF & MH Units		292.3078611		
Total Rented Motel, Skid Shacks, RV Spaces		457		

Householder by Age in 2000 and 2010

All Householder by Age	2000	% of Total	2010	% of Total
15-24 years	21	3.39%	44	4.95%
25-34 years	55	8.89%	116	13.06%
35-44 years	105	16.96%	223	25.11%
45-54 years	138	22.29%	105	11.82%
55-64 years	71	11.47%	138	15.54%
65-74 years	77	12.44%	71	8.00%
75-84 years	114	18.42%	77	8.67%
85 years and older	38	6.14%	114	12.84%
		This method	888	
		HUM method	886	
		Error	0.23%	
Owner Householder by Age	2000	% of Total	2010	% of Total
15-24 years	2	0.46%	4	0.45%
25-34 years	29	6.70%	61	6.87%
35-44 years	76	17.55%	161	18.13%
45-54 years	109	25.17%	83	9.35%
55-64 years	53	12.24%	103	11.60%
65-74 years	63	14.55%	58	6.53%
75-84 years	77	17.78%	52	5.86%
85 years and older	24	5.54%	72	8.11%
Renter Householder by Age	2000	% of Total	2010	% of Total
15-24 years	19	10.22%	40	4.50%
25-34 years	26	13.98%	55	6.19%
35-44 years	29	15.59%	62	6.98%

45-54 years	29	15.59%	22	2.48%
55-64 years	18	9.68%	35	3.94%
65-74 years	14	7.53%	13	1.46%
75-84 years	37	19.89%	25	2.82%
85 years and older	14	7.53%	42	4.73%

Household Income Levels by Percentage

	2000	Cum 2000	2010	Cum 2010
Below Poverty	19.07%	19.07%	14.40%	14.40%
Poverty to \$19,999	12.73%	31.80%	5.22%	19.62%
\$20,000-\$24,999	9.67%	41.47%	6.71%	26.34%
\$25,000-\$29,999	8.85%	50.33%	6.14%	32.48%
\$30,000-\$34,999	7.21%	57.54%	5.01%	37.48%
\$35,000-\$39,999	9.02%	66.56%	6.26%	43.74%
\$40,000-\$44,999	5.41%	71.97%	3.75%	47.50%
\$45,000-\$49,999	3.61%	75.57%	2.50%	50.00%
\$50,000-\$59,999	5.25%	80.82%	10.74%	60.74%
\$60,000-\$74,999	7.54%	88.36%	15.44%	76.17%
\$75,000-\$99,999	7.38%	95.74%	15.10%	91.28%
\$100,000-\$124,999	1.15%	96.88%	2.35%	93.62%
\$125,000-\$149,999	1.15%	98.03%	2.35%	95.97%
\$150,000-\$199,999	1.15%	99.18%	2.35%	98.32%
\$200,000 or more	0.82%	100.00%	1.68%	100.00%

Households by Size

	2000		2010	
Owner Household Size	Units	Percent	Units	Percent
Total owner occupied housing units	433	100.00%	593.692	100.00%
1-person household	119	27.48%	179.51	30.24%
2-person household	173	39.95%	260.969	43.96%
3-person household	56	12.93%	60.8504	10.25%
4-person household	52	12.01%	56.504	9.52%
5-person household	18	4.16%	19.5591	3.29%
6-person household	12	2.77%	13.0394	2.20%
7-person household	3	0.69%	3.25984	0.55%
	2000		2010	
Renter Household Size	Units	Percent	Units	Percent
Total renter occupied housing units	186	100.00%	292.308	100.00%
1-person household	113	60.75%	193.413	66.17%
2-person household	28	15.05%	47.9254	16.40%
3-person household	19	10.22%	21.5203	7.36%
4-person household	16	8.60%	18.1224	6.20%
5-person household	6	3.23%	6.79588	2.32%
6-person household	1	0.54%	1.13265	0.39%
7-person household	3	1.61%	3.39794	1.16%

Building Permits by Year: 2000 through 2010		
	HUD (1)	Corrected (2)
2010 single family		5
2010 multiple unit		38
2010 mobile home		4
2009 single family	8	8
2009 multiple unit	24	24
2009 mobile home		0
2008 single family	0	1
2008 multiple unit	0	0
2008 mobile home		0
2007 single family	2	1
2007 multiple unit	0	0
2007 mobile home		0
2006 single family	8	3
2006 multiple unit	0	0
2006 mobile home		0
2005 single family	1	1
2005 multiple unit	0	0
2005 mobile home		0
2004 single family	1	3
2004 multiple unit	0	0
2004 mobile home		0
2003 single family	2	2
2003 multiple unit	0	0
2003 mobile home		0
2002 single family	0	2
2002 multiple unit	0	0

2002 mobile home		0
2001 single family	0	1
2001 multiple unit	0	0
2001 mobile home		0
2000 single family	0	0
2000 multiple unit	0	0
2000 mobile home	46	0
total 2000-2010 all units		93
total 2000-2010 single family		56
total 2000-2010 multiple unit		32
total 2000-2010 mobile home		5

(1) <http://socds.huduser.org/permits/index.html>

(2) Building permit records, observations and interviews

2010 Rents

Watford City Market-Rent Levels

Condition	Single family home	Multi-family apartment (One- bedroom unit)	Multi-family apartment (Two bedroom unit)	Multi-family apartment (Three bedroom unit)	Multi-family apartment (Four bedroom unit)	Mobile home	Mobile home court rental	RV court rental
Existing (facility/building)	\$300-\$1000/mo.	\$350-\$600/mo.	\$400-\$825/mo.	\$800-\$900/mo.	\$550/mo.	---	\$450-\$800/mo.	\$400-\$800/mo.
New (facility/building -- constructed 2007 or later)	---	\$520	\$620	---	---	---	---	---

Source: Ondracek, Witwer, & Bertsch

Vacancy Rates

All rental properties are fully absorbed at 2010. See Appendix A.

Model Estimating New Construction Rental Rates (Example of an 8-plex)

Structure		Lot & Site Development	
			Enter 'land' value: \$40,000.00
		Land:	
	Enter first 2:	Grading, graveling, paving, water, sewer, storm sewer, curb, sidewalks, landscaping, and design fees (2)	Enter Per Unit Upgrades: \$10,000.00
Square Feet Per Unit:	861		
Number of Units:	8		
Construction per Sq Ft: (1,4)	\$127.50		
Contractor Fees (Included):	\$0.00		\$80,000.00
Architect Fees (7%) (1,4):	\$0.00		
Total Costs per Sq Ft:	\$127.50		
Grand Total Construction:	\$878,220.00	Total Lot & Improvements:	\$120,000.00

Enter APR for building loan: (4d)

6.50%

Per Unit Monthly (4)

Monthly amortization per unit		Maint Fees (4a)	Mgmt Fees (4b)	Utility Costs (4c)	Taxes (4e)	Insurance (4f,5)	Total Per Unit
5 year payback	(2,441.42)	244.14	170.90	219.73	42.72	31.67	\$3,150.57
10 year payback	(1,416.82)	141.68	99.18	127.51	24.79	31.67	\$1,841.66
15 year payback	(1,086.95)	108.69	76.09	97.83	19.02	31.67	\$1,420.24
20 year payback	(930.31)	93.03	65.12	83.73	16.28	31.67	\$1,220.13
25 year payback	(842.51)	84.25	58.98	75.83	14.74	31.67	\$1,107.97

(1) Wayne Whitty - 852-4850: Construction fees \$180 per sq ft with 7% architect fees

(2) Ryan Ackerman - 852-6363

(3) Lon Drevecky - 837-8737 - Left message on 9/27/2010

(4) Bruce Walker - 852-0136: Construction costs (including contractor and architect fees) are about \$127.50 per sq ft.

(4a) Approximate Maintenance Fees: 10% of rents collected

(4b) Approximate Management Fees: 7% of rents collected

(4c) Approximate Fuel Costs: 9% of rents collected

(4d) Terms are running about 6.5% for up to 25 years.

(4e) Taxes are running 1.7% to 1.8% of assessed value

(4f) Examples: \$1857 for a 5plex (\$371 per unit per year); \$14000 for a 36plex (\$389 per unit per year)

(5) Insurance is age-dependent (newer=cheaper)

Discussion of Developments and Developable Land

Watford City: Developments and Developable Land

	Number of lots	Type	Owner/identifier	Description	Comments
Commercial					
Industrial					
Residential					
Veeder Estates	60	Upscale residential	Cascade Homes	In city limits	Will build homes per demand
Potential residential developments					
45 acres behind courthouse	Not platted (150?)	Undeveloped residential	Watford City	In city limits	Above city water tower; will require lift station for development; potential to be developed with a mix of residential and hotel uses

Source: Gene Veeder, Executive Director of the McKenzie County Job Development Authority and Tourism Bureau
McKenzie County Real Estate Historical Sales

Watford City has annexed few if any properties since the 2000 census. However, as developed in the table above Watford City has land available for development and annexation. Watford City maintains a one half mile extra-territorial area (ETA) and seeks to place man camp/temporary RV developments within the city limits and within the half-mile ETA.

Property Values

McKenzie County Home Sales

Home sales	2010*	2009	2008	2007	2006	2005	2004	2003	2002	2001	2000
Number of sales	46	42	53	31	44	52	48	37	31	34	40
Average value	\$50,793	\$56,263	\$47,142	\$38,103	\$46,645	\$37,461	\$36,894	\$40,993	\$39,452	\$29,767	\$31,737
Sales volume	\$2,336,493	\$2,363,051	\$2,498,551	\$1,181,200	\$2,052,400	\$1,947,965	\$1,770,890	\$1,516,725	\$1,223,015	\$1,012,064	\$1,269,474

Source: ND State Tax Office

*2010 data is tabulated from the first two quarters of 2010

McKenzie County Lot Sales

Lot sales	2010*	2009	2008	2007	2006	2005	2004	2003	2002	2001	2000
Number of sales	6	11	8	6	10	1	4	9	5	3	4
Average value	\$4,058	\$11,845	\$4,638	\$3,833	\$5,940	\$1,000	\$4,950	\$3,100	\$3,880	\$3,933	\$3,950
Sales volume	\$24,348	\$130,295	\$33,500	\$23,000	\$59,400	\$1,000	\$19,800	\$27,900	\$19,400	\$11,800	\$15,800

Source: ND State Tax Office

*2010 data is tabulated from the first two quarters of 2010

McKenzie County Mobile Home Sales

Mobile home sales	2010*	2009	2008	2007	2006	2005	2004	2003	2002	2001	2000
Number of sales	5	1	2	5	5	8	5	4	3	2	5
Average value	\$22,200	\$22,500	\$16,750	\$7,500	\$23,794	\$20,319	\$9,200	\$17,425	\$8,500	\$4,700	\$14,360
Sales volume	\$111,000	\$22,500	\$33,500	\$37,500	\$118,970	\$162,555	\$46,000	\$69,700	\$25,500	\$9,400	\$71,800

Source: ND State Tax Office

*2010 data is tabulated from the first two quarters of 2010

McKenzie County Real Estate Historical Sales: Home Sales

Home sales	2010	2009	2008	2007	2006	2005
Number of sales						
Average value						
Median value						
Maximum price						
Minimum price						

Source:

Watford City Real Estate Historical Sales: Lot Sales

Lot sales	2010	2009	2008	2007	2006	2005
Number of sales						
Average value						

Source:

Watford City Existing Residential Homes for Sale September, 2010

Description	Asking Price	Status
Single family	\$220,000	Market
Single family	\$160,000	Market
Single family	\$170,000	Market
Single family	\$250,000	Market

Source: Deb Hanson, Basin Brokers, Watford City, ND

Discussion of Watford City Infrastructure

Infrastructure	Description	Condition	Capacity based on Population	Comments
City	Approx 900+ acres			
Streets	Approx 16 miles of city streets and alleys. Main thoroughfares thru town are US85 and ND23.	Fair	capacity is not a factor in the foreseeable future	Streets are in need of annual maintenance. Annual maintenance cost is estimated at \$450,000/yr and does not include paving of existing gravel roads and alleys.
Curb/Gutters	Unknown but would estimate 20+ miles of curbs and gutters.	Fair	Not applicable	City recently budgeted for an annual maintenance program that should keep pace with rate of deterioration. Does not include an annual capital plan for future expansion of curb and gutter in the city. Not all city streets have curb and gutter.
Sidewalks	Unknown but would estimate 20+ miles of curbs and gutters.	Poor to fair	Not applicable	City recently budgeted for an annual maintenance program that should keep pace with rate of deterioration. Does not include an annual capital plan for future expansion of sidewalks in the city. Not all city streets have sidewalks.
Street Lighting	Mostly pole-mounted cobra head fixtures	Fair	Not applicable	Not all streets have adequate street lighting. There is no capital plan in place at this time to improve street lighting.
Storm Sewers	Unknown number of inlets and miles of storm sewers	50% Good to Excellent, 50% fair to poor	There are capacity problems in an estimated 50% of the city's storm sewers.	A minimal amount is budgeted annually for miscellaneous storm sewer repairs. There is no capital plan in place at this time for system upgrades.

Sanitary Sewers	11 miles of sanitary sewers	10% Good to excellent, 40% fair, 50% fair to poor	The city is in the midst of a capacity analysis to identify sewer collection system deficiencies and develop a capital plan. It is estimated that the current wastewater collection system can serve a population of 2,400 persons.	A minimal amount is budgeted annually for miscellaneous sewer collection system repairs. There is no capital plan in place at this time for system upgrades.
Sewage Treatment	6 sewage treatment lagoons; three in active use; 1 in part-time use; two inactive cells	Fair	The city is in the midst of a capacity analysis to identify sewage treatment system deficiencies and develop a capital plan. It is estimated that the current wastewater treatment system can serve a population of 2,400 persons. However, an estimated \$1.2M is necessary to maintain the lagoons in an acceptable long-term condition.	A minimal amount is budgeted annually for miscellaneous sewage treatment system repairs. There is no capital plan in place at this time for system upgrades.
Garbage Collection	One refuse collection vehicle, city owns all dumpsters, residential refuse containers are provided by residents	Good	Sanitation fund is in good shape, refuse collection vehicle and commercial refuse container depreciation is funded	Sanitation staff is at capacity at our current population. Will need to add staff or consider alternate collection options if growth trends continue.
Recycling Facilities	Not applicable	Not applicable	Not applicable	Not applicable
Landfill	Not applicable	Not applicable	Not applicable	Not applicable
Water Supply	Five groundwater source wells	Fair	Wells are sometimes running 70% of the day due to industrial demand. This rate should not be the norm. The city should consider adding additional source water at this time if industrial demand continues to develop at its current rate.	The city is not adequately funding depreciation at this time. The city needs to invest about \$25,000 annually in its source water system to fund depreciation and keep pace with system deterioration.

Water Treatment	Two iron and manganese removal treatment plants plus chlorination and fluoridation	Fair	Water plants are sometimes running 70% of the day due to industrial demand. This rate should not be the norm. The city should consider short-term treatment options at this time if industrial demand continues to develop at its current rate.	The city is not adequately funding depreciation at this time. The city needs to invest about \$60,000 annually in its water treatment plants to fund depreciation and keep pace with system deterioration.
Water Lines	Five groundwater source wells	10% Good to excellent, 60% fair, 30% fair to poor	Water lines range in age from about 20 years to 80 years of age. The city should consider adding additional source water at this time if industrial demand continues to develop at its current rate.	The city is not adequately funding depreciation at this time. The city needs to invest about \$125,000 annually in its distribution system to fund depreciation and keep pace with system deterioration.
Water Storage	Two 1 million gallon reservoirs	Fair	The city's two reservoirs are about 30 years old. Reservoir capacity is adequate for a population of 2400.	The city is not adequately funding depreciation at this time. The city needs to invest about \$50,000 annually in its storage reservoirs to fund depreciation and keep pace with system deterioration.
Parks		10% Good to excellent, 50% fair, 40% fair to poor	Unknown	The city's park grounds are well maintained.
Recreation Facilities		10% Good to excellent, 60% fair, 30% fair to poor	Unknown	The majority of equipment is old and the facilities are outdated. Some park infrastructure is in a state of severe disrepair.
City Offices	City Hall, Gym, & Meeting Rooms	Good		
City Shops	Three shop buildings	Fair		

Watford City Utility Rates

Utilities	Residential Rate	Commercial Rate	Rates Sufficient To Cover Maint. & and Future Const?	Comments
Garbage	\$19.51/Mo	See Below	Yes	
Water	\$19.03/Mo + \$1.58/1000 Gal	\$19.03/Mo + \$1.58/1000 Gal	No	Bulk sales are \$15.00/1000 Gal
Sewer	\$14.28/Mo + \$0.57/1000 Gal to a Maximum of \$18.84/Mo	\$14.28/Mo + \$0.57/1000 Gal	No	

Watford City Sanitation Rates

Commercial DUMPS/WEEK	CANS			DUMPSTERS					
	1 CAN	2 CANS	3 CANS	1 YARD	1.5 YARD	2 YARD	3 YARD	4 YARD	6 YARD
1	\$19.51			\$39.81	\$47.71	\$55.58	\$71.53	\$87.26	\$118.99
2				\$78.69	\$94.41	\$110.10	\$141.69	\$173.07	\$236.09
3				\$117.57	\$141.11	\$164.62	\$211.86	\$258.88	\$353.18
4				\$156.44	\$187.81	\$219.14	\$282.02	\$344.69	\$470.28
5	\$32.35	\$64.69	\$97.04	\$195.32	\$234.51	\$280.68	\$352.19	\$430.49	\$587.37
6				\$234.20	\$281.21	\$328.18	\$422.35	\$516.30	\$704.47
7				\$273.08	\$327.91	\$382.71	\$492.52	\$602.11	\$821.56
Residential*	\$19.51								
	* Residential pick-up is once weekly								

Appendix A

Housing Particulars

Watford City Subsidized, Low-Income Tax Credit, Market-Rate, and Income Targeted/Moderate Income Apartments

City identifier and age	Contact	Units	Efficiency	1-bedroom	2-bedroom	3-bedroom	4-bedrooms	Garage	Current rent, waiting list, number of calls in last week	Number living in the building; percent under 18	Percent permanent; percent temporary	Renter (company or individual)	Notes	Comments	Type
Subsidized															
Hillside Court	McKenzie County Housing Authority Wally Johnson 701-570-0530; L.D. Management, Dickenson 701-290-0206	38		38				0	30% AGI; 0 on list; 3 calls full	38/0	Permanent	Individual	Originally 40 units; converted two units into a kitchen and community room	Building owners approached MHA and sold property for below appraised value to preserve subsidized status	30% AGI Elderly and disabled
Market															
Bursept Properties	Reyburn Johnston, Manager 701-842-4205	2					2	2	\$550—4 bed; rent includes water sewer, and garbage		50%/50%	Individual and company			Market
Johnston Enterprises	Reyburn Johnston, Manager 701-842-4205	3		1	2			0	\$350—1 bed; \$600—2bed; rent includes water sewer, and garbage		50%/50%	Individual and company			Market

Oakridge	Reyburn Johnston, Manager 701-842-4205	12		6	6			6	\$500—1 bed; \$600— 2bed; rent includes water sewer, and garbage		50%/50%	Individual and company			Market
Regency	Reyburn Johnston, Manager 701-842-4205	6		2	2	2		0	\$600—1 bed; \$700—2 bed; \$800—3 bed; rent includes water sewer, and garbage		50%/50%	Individual and company	Property recently sold and rents increased		Market
Schmidt	Reyburn Johnston, Manager 701-842-4205	12			12			0	\$550— 2bed; rent includes water sewer, and garbage		50%/50%	Individual and company			Market
Townhouses	Reyburn Johnston, Manager 701-842-4205	6			6			6			50%/50%	Individual and company			Market
	Total for Reyburn Johnston, managed properties								10-12 on list; 12 calls last week	92 total; 10 (or 11%) under 18					
GT Contracting 1970s	Gar y Thorson 701-842-3695; 701-770-3695	12			12			0	\$400— smaller 2-bed; \$450 for larger 2- bed; 30 on list; 6 calls	18/1 1 is an oilfield truck driver lives in apt during the week and home to Belfield on weekends	Permanent	Individual	Like to stay on the low end for rent; screen tenants	1 is an oilfield truck driver lives in apt during the week and home to Belfield on weekends	Market Review rent in Jan.; probably increase rents by \$50

Highland Properties	Deann Long 701-572-8191 Managed by Community Action Partnership www.willistoncap.org	11			11			0	\$425- \$600—2 bed; rent includes water, sewer, and garbage (tenant pays electric); no effective waiting list; 20 calls per week	23/10	90%/10%	Individual; have been approached by companies			Market rate effective Sept. 1, 2010; HOME funding ended; ½ tenants are existing and pay \$425; will increase to \$500 in 6 months; new tenants will pay \$600/mo
Watford City Housing Authority	Kelly Pederson 701-842-2381; Brent Sanford, 701-444-2341 Vicki 444-6411	8			4	4		4- single stalls- 2 bed units 4- double stall;	\$900—3- bed; \$825—2- bed 2- stall \$725— 2- bed single stall		37.5%/62.5%		3 rented to elderly; 4 rented to oilfield families; 1 to Conoco Phillips that is shared by rotating engineers		Market
Income Targeted/ Moderate Income and Market Apartments															

Creekside Cottages Watford City	Lutheran Social Services Jessica Thomasson 701-271-3201	24		8	16			24	\$335-\$411 (income targeted), \$520-\$620 market rate; maintain a waiting list	50 total (15-20% under 18)	100%/0%	Individual		Newly constructed	Income targeted/moderate income and market rate Mixed income (13 at 80% AMI, 11 at market)
Company-owned Apartments (Provided for Employees)															
Cascade Homes	Gene Veeder 701-444-2804	8 townhouses 1 sold; 7 used for Cascade worker housing			X							Company	Townhouses now housing Cascade employees; will be sold later	Cascade tried to sell the units for approx. \$150,000 but financing was problematic	Market
Potential Apartment Construction															
West of courthouse	Deb Hanson, Realtor 701-570-4087	40 units													Market

Source: Brent Sanford, Mayor of Watford City; Gene Veeder, Executive Director of the McKenzie County Job Development Authority and Tourism Bureau; Deb Hanson, Realtor, Basin Brokers; Named contacts

Watford City Mobile Home Courts and Recreational Vehicle Courts (Inside City Limits)

City identifier and age	Contact	Lots MH; RV	Lot rental MH	Lot rental RV	Amenities	Current vacancy rate MH; RV	Number living in the court; percent under 18	Percent permanent; percent temporary	Renter (company or individual)	Future plans
Cherry Creek Campground 3 rd Ave SE	Doug Bolkan Counted by Ondracek, Witwer, and Veeder Sept 13, 2010	115-120 4 new MH; 17 existing MH; 48 RVS; 48 skid shacks	Believed to be \$450	Believed to be \$450			8-12; 34-51; 48-96;96-144; unknown			
Conditional use permit (North of Truck Route)	Tami Wilson									
Conditional use permit 8 units	Steve Sanford	8 units								
Conditional use Cascade Homes B & Z Restaurant site	Cascade Homes Counted by Ondracek, Witwer, and Veeder Sept 13, 2010	14 RVs					14-28; unknown			
Fairground	Doug Bolkan Counted by Ondracek, Witwer, and Veeder Sept 13, 2010	26 RV lots		Believed to be \$400	Electricity only		6-9; 26-52; unknown			
Glen Wahus CTI Construction	Glen Wahus	7 RVs					7-14; unknown			
Near McKenzie Inn Annex	Counted by Ondracek, Witwer, and Veeder Sept 13, 2010	9 skid shacks; 4 RVs; 18-27; 8					8-27; 4-8 ; unknown			
Watford City Housing Authority	Kelly Pederson 701-842-2381; Brent Sanford, 701-444-2341 Vicki 444-6411	17 RV spaces; all filled-have to be self-contained		\$450	Full utilities	Waiting list 7/8	17-34; unknown	All oil workers		In flood plain
Watford City Tourist Park Campground Highway 23 E	Watford City Park District PO Box 13 Watford City 701-570-3677	20 sites- 14 w/elect/water 6 primitive (4 extended stay) 14 day limit		Extended \$410/month Others \$17/day	Water and electric; no sewer. Public bathroom w/showers	Full	18-36; 4-12; unknown	Will shut down in November	Individuals 3-families	Self registration; more maintenance RV's out by Nov for deer hunters

White Buffalo (Olson Trailer Park) 708 4 th Ave. NE, Highway 23 E	Alice Olson PO Box 689, Watford City 701-842-4839; 701-260-0210	Believed to have 1 MH; 59-80 RV slots; last year 15 RV kept over winter (very poor practice—ice built up inside the RV)	Believed to be \$800/mo.	Believed to be \$800/mo.	Provides water, sewer, garbage, and electricity	Believed to be full	60-160; unknown	Unknown but believed to be temporary workers; but many of the same RVs have been in the court for 8 months	Unknown	Unknown
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Source: Brent Sanford, Mayor of Watford City; Gene Veeder, Executive Director of the McKenzie County Job Development Authority and Tourism Bureau; Named contacts

Watford City Mobile Home Rentals*

City identifier and age	Contact	Rental mobile home and age	Size (single/dbl; bedrooms)	Mobile home rental rate; does this include the lot rent?	Current rent, waiting list, number of calls in last week	Number living in the mobile home; percent under 18	Percent permanent; percent temporary	Renter (company or individual)	Notes	Comments
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*No rental mobile homes were identified

City of Watford City Rental Houses

City identifier and age	Contact	Bedrooms					Garage	Current rent, waiting list, number of calls in last week	Number living in the building; percent under 18	Percent permanent; percent temporary	Renter (company or individual)	Notes	Comments
		1-bedroom	2-bedroom	3-bedroom	4-bedrooms	5-bedrooms							
Reyburn Johnson manages 21 houses (7 1-bed; 7 2-bed, and 7 4-bed houses)	Reyburn Johnston, Manager 701-842-4205	7	7	0	7		5	\$500—1 bed; \$600—2bed; \$1000 4-bed; 10-12 on list; 12 calls last week	50/10 or 20% under 18	50%/50%	Individual and company	The house's age makes little difference	Market
Gene Veeder	Gene Veeder, Owner 701-444-2804	1					0	\$350—1bed; rented to a family member; Veeder receives 1-2 calls per day and the Watford City Tourist office receives 5-6 per day	1/0		Individual	Small older house near courthouse	Market

Source: Brent Sanford, Mayor of Watford City; Gene Veeder, Executive Director of the McKenzie County Job Development Authority and Tourism Bureau; Named contacts

Watford City Man Camps/Temporary Recreational Vehicle Courts and Trailer Courts (McKenzie County)*

Identifier	Contact	Type	Permitted units*	Permitted* capacity (individuals)	Company	Amenities	Current occupancy rate	Percent permanent; percent temporary	Open closed	Rate	Notes
3-J Construction	3-J Construction Counted by Ondracek, Witwer, and Veeder Sept 13, 2010	RV spaces	3 RVs	3-6; 1.5 years ago 3 Jay's lot was full	3-J Construction						Man Camp
Greg's Welding	Greg's Welding Counted by Ondracek, Witwer, and Veeder Sept 13, 2010	All-year mobile homes	20 MH now; 120 later	40-60; later 240-260							Man Camp; next to Baker Treolite chemical storage warehouse—safety issue
Forest Service	Forest Service Counted by Ondracek, Witwer, and Veeder Sept 13, 2010	RV spaces	7 RVs	7-17				Permanent			Man Camp
Killer Bee Trucking	Killer Bee Trucking Counted by Ondracek, Witwer, and Veeder Sept 13, 2010		5 RVs	5-10							Man Camp
Off 85 S	Unknown Counted by Ondracek, Witwer, and Veeder Sept 13, 2010	All-year skid shacks	27 skid shacks	54-81							Man Camp
Power Fuels Long X	Mark Jonsrud Counted by Ondracek, Witwer, and Veeder Sept 13, 2010	Mixed; all-year mobile homes and RVs	42 single-wide MH; 25 RVs; 4 skids shacks; 24 additional potential spaces	84-126; 25-50; 12-15					Closed-- Power Fuels only		Man Camp/Mobile Home Court

Power Fuels Behind Power Fuels Building	Mark Jonsrud Counted by Ondracek, and Witwer Sept 13, 2010	Mixed; all-year mobile homes and RVs	Mixed lot 27 spaces; 12 RVs; 4 skid shacks; 4 short single wide MH	12-24; 8-12; 4-8							Man Camp
Prairie Land RV Park	Hal Swearson 701-842-3986	All-year skid shacks	12 skid shacks	24-36							Man Camp
Red Rock Trucking	Barney Pheiffer	All-year mobile homes	3 mobile homes configured as a 9 unit motel style man camp	9-18							Man Camp
Sunland Construction /Saddle Butte I NE of Watford City	Sunland Construction Craig Nelson Counted by Ondracek, Witwer, and Veeder Sept 13, 2010	All-year facility	40 skid shacks (reported that later 80 units total will be installed)	80-120 (reported that 200-300 will inhabit Sunland's camps)	Sunland; Sunland is building the Saddle Butte pipeline and work is expected to take 12-20 months			0%/100%	Closed		Man Camp; sewage is hauled to Minot since Watford City's plant can't handle it
Sunland Construction /Saddle Butte II NE of Watford City	Sunland Construction Craig Nelson Counted by Ondracek, Witwer, and Veeder Sept 13, 2010	RV spaces	48 RV pads; 12 RVs occupied	48-96; 12-24	Sunland; Sunland is building the Saddle Butte pipeline and work is expected to take 12-20 months			0%/100%	Closed		Man Camp; uses well water
Man Camps and Mobile Home Courts Under Construction											
Melgard/ Tank Trailer Court (former Prairie View Trailer Park) 39 acres	McKenzie County Water Resources District records	All-year mobile homes	First phase completed--20 MH spaces								Mobile home lots, modular lots, and industrial lots; records show it is still owned by Deb Rolla; infrastructure is poor; originally had a lagoon system
Potential Man Camp Developments											
Former Sorenson RV Site	McKenzie County Water Resources District records	RV spaces	15 RV pads	15-30							Man Camp
S of Watford City Airport	Griffin Scarlet		Platted for 200 spaces								Man Camp

S of Watford City Airport	McKenzie County Water Resources District records	All-year mobile homes	98 MHs	196-294							Man Camp/ Mobile Home Court
S of Watford City	McKenzie County Water Resources District records	All-year mobile homes	28 MHs	56-84							Man Camp/ Mobile Home Court
Stenejhem	McKenzie County Water Resources District records	RV spaces	20 RV pads	20-40							Man Camp
Val Holmes Mobile Home Court	McKenzie County Water Resources District records	All-year mobile homes	120 MHs	240-360							Man Camp/ Mobile Home Court; scheduled for Spring 2011

Source: Brent Sanford, Mayor of Watford City; Gene Veeder, Executive Director of the McKenzie County Job Development Authority and Tourism Bureau; McKenzie County Water Resources District; Named contacts

*McKenzie County is the only county in ND without zoning; thus, no man camps and other developments can be placed without permits and no solid understanding of all such developments is possible.

City of Watford City Senior Apartments

City identifier and age	Contact	Units	Efficiency	1-bedroom	2-bedroom	Garage	Rent and waiting list	Current vacancy rate	Historic vacancy rate	Comments	Type
Good Shepherd Home, Horizon Assisted Living Apartments 1999	Donna White Owl, manager, 701-444-2331	15		11	4	0	\$1459.50-\$1541.40— one bed; \$1622.25-\$1648.50; 17 on list	0; had one and filled immediately	When first opened had vacancies but in last few years building has been full	There is a need for more assisted living and independent living apartments in Watford City	Assisted Living Market
Good Shepherd Home, Manor Independent Living Apartments	Donna White Owl, manager, 701-444-2331	4		4						Good Shepherd Home no longer has Independent Living apartments. These are being used by locum medical providers	Independent Living

Source: Brent Sanford, Mayor of Watford City; Gene Veeder, Executive Director of the McKenzie County Job Development Authority and Tourism Bureau

City of Watford City Motels, Hotels, and Sleeping Rooms

City identifier age	Contact	Units	1-bed	2-bed	Suite	Rental rate	Occupancy	Number in building	Traveler/workers percentages	Spot; long term percentages	Renter (company or individual)	Notes	Type
Four Eyes Motel	701-444-4126; 1-866-816-4126	10											Motel
McKenzie Inn	Mrs. Maki 701-444-3980; 1-800-842-3989	15		12	3	\$49/one person; \$61/two people; \$109/suite	99.9% May be able to take reservations in Nov.	20+	2%/98%; do keep back three rooms usually	95%/5%; one person in McKenzie Inn since June; some work 14 days on and leave for 4 days off but the room is rented to others during these four days	Individuals	No other rentals	Motel
McKenzie Inn Annex (assume same rates as McKenzie Inn)	Mrs. Maki 701-444-3980; 1-800-842-3989	9 motel units in mobile homes near Veeder Estates		9?		\$49/one person; \$61/two people; \$109/suite	99.9% May be able to take reservations in Nov.	15?	2%/98%; do keep back three rooms usually	95%/5%; one person in McKenzie Inn since June; some work 14 days on and leave for 4 days off but the room is rented to others during these four days	Individuals	No other rentals	Motel
Roosevelt Inn and Suites	701-842-3686; 1-800-887-9170 Refused to answer more questions	44	25	16	3	\$49/one person; \$61/two people; \$109/suite					Individuals and company		Motel
Old School Bed and Breakfast 10 miles west of Watford City	701-586-3595; 1-888-366-8787												Hotel (B&B)

Motel, Hotel, and Sleeping Rooms Under Construction												
Cascade Homes old B & Z restaurant	Gene Veeder 701-444- 2804	16 person dorm under construction in old B & Z restaurant										Sleeping Rooms
Extended Stay Cascade Homes	Gene Veeder 701-444- 2804	72 units;			X	Believed to be set at \$79/night						Motel; will be converted to 36 2-bed condos as an exit strategy
Roosevelt Inn and Suites	701-842- 3686; 1- 800-887- 9170 Refused to answer more questions	40 units 20 duplex cabins; Permitted and building										Motel; exit strategy is to sell as hunting cabins

Source: Brent Sanford, Mayor of Watford City; Gene Veeder, Executive Director of the McKenzie County Job Development Authority and Tourism Bureau; Named contacts