Fiscal and Economic Impact Analysis of Proposed Nexus Natural Gas Pipeline on the City of Green, Ohio

by
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INTRODUCTION

In 2014 Spectra Energy ("Spectra") and DTE Energy announced plans to build a high-pressure natural gas transmission pipeline (called "Nexus") that would run from the Utica-Marcellus region near eastern Ohio across northern Ohio, into Michigan, and ultimately into Chicago and Ontario, Canada. The stated purpose for building the proposed pipeline is to take anticipated "growing" gas supplies produced from the Appalachian Basin to the "high demand" markets in Ohio, Michigan, Chicago and Ontario.[1] Nexus proposes 250 miles of high pressure, 36 inch diameter pipeline capable of carrying around 1.5 billion cubic feet of natural gas per day.[2]

However the route proposed by Nexus takes the pipeline through some of Ohio's fastest growing and most prosperous communities. In particular, the pipeline route promises to disrupt development plans in the City of Green (Summit County). Importantly, as will be shown in the discussion below, the proposed route will render useless large portions of prime industrial and commercially zoned land that Green has earmarked for near term development. Much of this land is next to the Akron-Canton airport, and is of considerable interest to the business community.

Accordingly, the City of Green has proposed to Nexus an alternate route that accomplishes Nexus's goals of moving natural gas from Appalachia to Michigan and Ontario. The alternate route, which could be built for about the same cost as Nexus's plan, bypasses and spares the fast growing City of Green, instead taking the pipeline through a more rural area. With proper planning, potential negative impacts on future industrial or commercial development could be minimized by using an alternate route in a more rural setting. Although we expect that property value and tax losses, if any, would be minimal for the alternate route, these results are not set forth here.

The route currently proposed through the City of Green would, however, lead to uneconomic remnant parcels, as well as devalued or stranded residential parcels. The proposed route is shown on Exhibit

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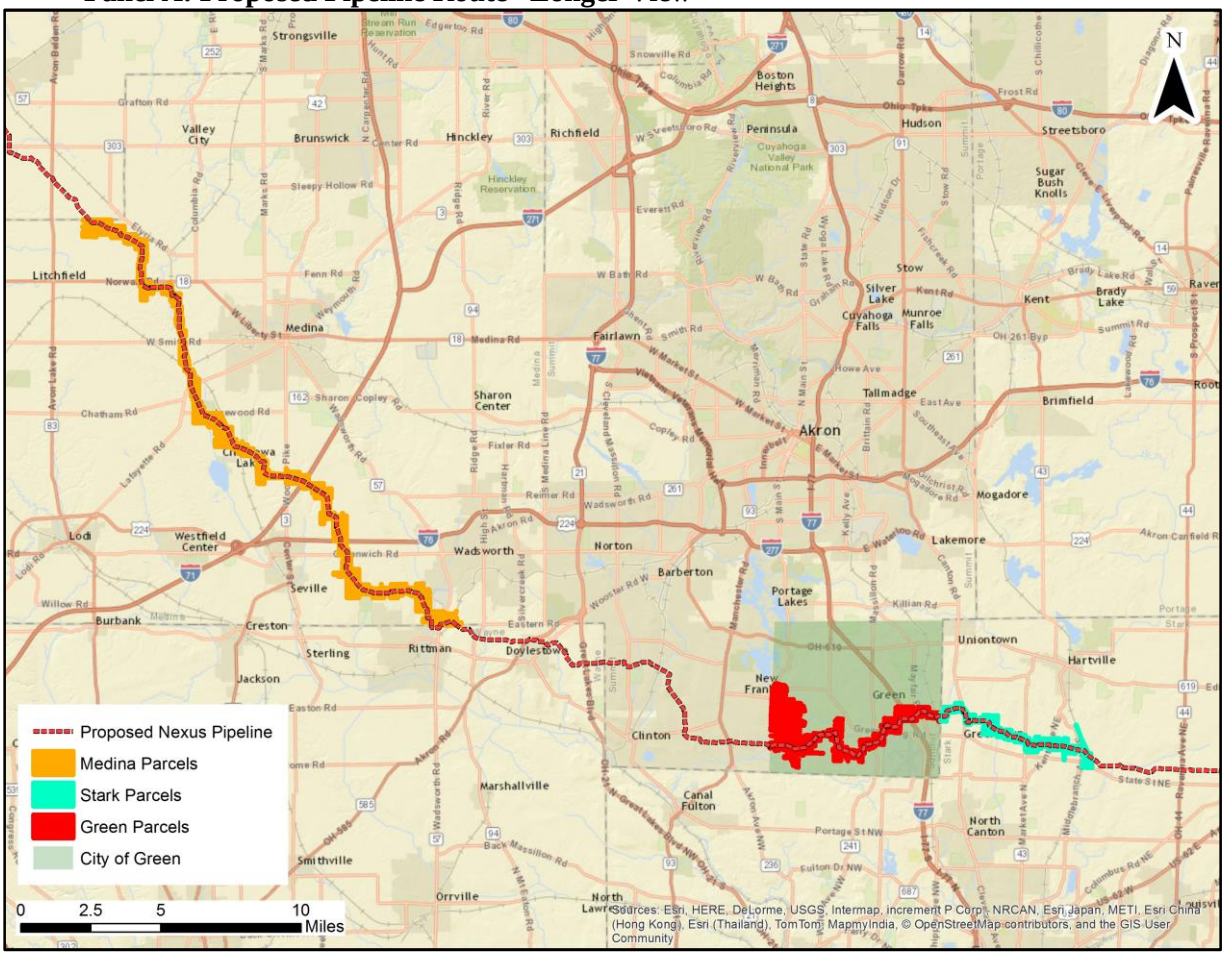
[1] Spectra Energy, "New Projects and Our Process" 2015, https://www.google.com/search?q=spectra+energy+nexus+pipeline&ie=utf-8&oe=utf-8

[2] *Id*.

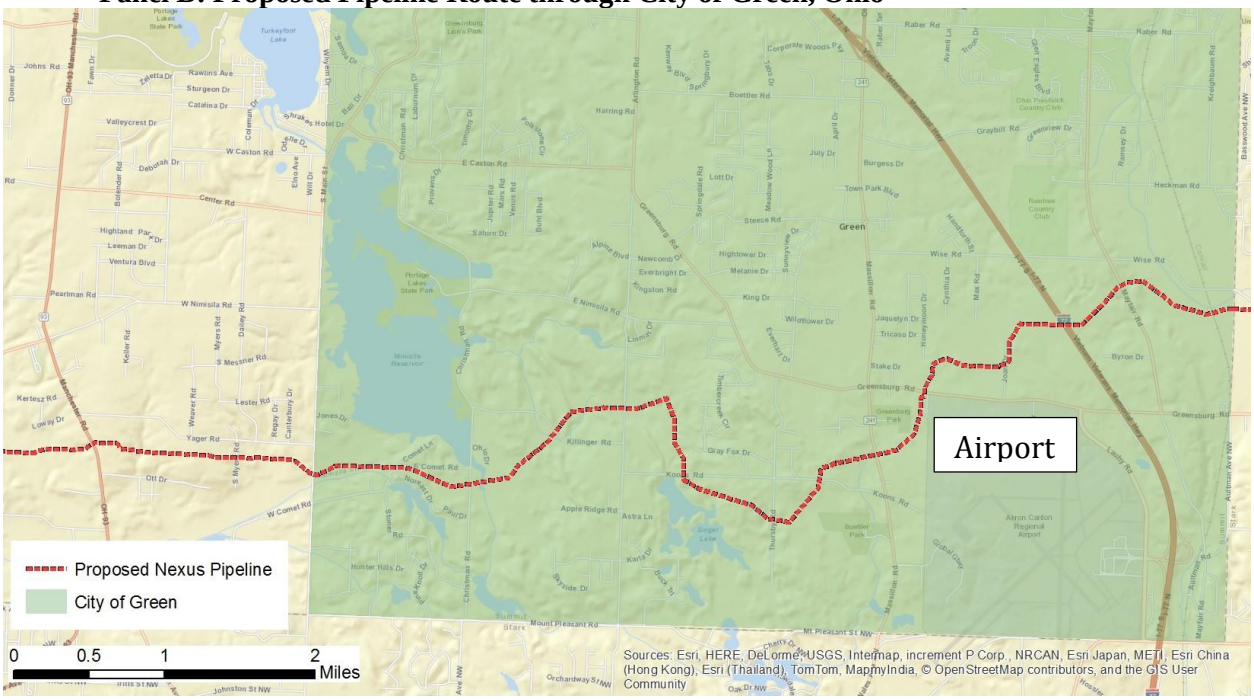
1 (both panels). Over the life of the pipeline, this would in turn lead to very substantial losses in property taxes and income tax for the City of Green. In short, while there may be compelling reasons for the pipeline to be built, and while it may be beneficial for portions of Ohio in terms of taxes and construction jobs, the current route leaves the City of Green to suffer disproportionately the losses the pipeline will cause. The following discussion sets forth the basis for this determination.

Exhibit 1: City of Green and the Study Area Overview Map[3]
Panel A: Proposed Pipeline Route –Longer View



[3] The highlighted parcels in Green were included in the Study Team's analysis.

Panel B: Proposed Pipeline Route through City of Green, Ohio



City of Green Demographics

Green is located in Summit County between Canton and Akron, Ohio, along U.S. Interstate 77. It was first incorporated as a city in 1992 with a population of 19,179. By 2010 the population of Green had risen to 25,669.[4] During this same period, Ohio population grew from 11.03 million to 11.54 million.[5] So while Ohio's population grew about 4.5% over nearly 20 years, Green's population grew 34%. Employment in Summit County likewise has been growing faster than in Ohio. From 2013 to 2014 employment in Summit County grew 2.5% -- nearly twice the rate of employment in the State (1.3%).[6] In addition, home values in Green ($163,800) are higher than the state of Ohio overall ($130,000). Similarly, Green's median household income is greater than that of the state ($61,665 to $48,308).[7] Also, according to the City Planning department, over 100 residential building permits were issues annually, since 2000.

[4] http://www.cityofgreen.org/1992-2012-green
[5] United States Census Bureau, found at: http://quickfacts.census.gov/qfd/states/39000.html
[6] http://www.cityofgreen.org/uploads/economic-indicators-sept-2014.pdf
[7] "Zillow Home Value Index" Zillow 12/15. http://www.zillow.com/green-oh/home-values/
"American FactFinder" United States Census Bureau American Community Survey 2010-2014. http://factfinder.census.gov/faces/nav/jsf/pages/community_facts.xhtml

With respect to fiscal indicators, Green has received an "AAA/Stable" for long-term bond ratings. This rating reflects Standard and Poor's view of the revenue stream from City Income Tax (2%) and the ongoing rate of growth in the community. It also reflects Standard and Poor's judgment that the community's economy is broad, diverse and growing.[8] Green has a projected per-capita effective buying income of 118% of the national average, and the city's market value grew by 3 percent the past year to 2.9 billion.[9] It is also home to the Akron-Canton Airport, making the region particularly attractive to new industrial and commercial development. Portions of the proposed route for the Nexus pipeline would affect the airport development zone.

The balance of this paper presents the pertinent literature, then addresses the methodologies for calculating potential fiscal impacts to residential property (putting losses in a time frame, calculating foregone property taxes and income taxes), and commercial property (property taxes, income taxes). After the fiscal benefits from the pipeline are set forth, these analysis proceeds with a net fiscal impact summary and conclusions for the City of Green, and overlapping jurisdictions within its boundary.

Literature Review

The literature review section below covers the effects of linear hazards (of which pipelines is a part, as well as pipelines directly, both existing and after explosive events have transpired, on residential property. While there is a fair amount of literature (reviewed below), it turns out reductions in value to existing property is a small part of projected impacts, and the bulk would come from lost opportunity to develop economic remnant (cut-off, or stranded parcels), over a long time period. These concepts are introduced in the land residual approach section.

[8] Standard & Poor's Rating Services, Green, Ohio, July 17, 2015, available at www.standardandpoors.com.ratingsdirect.
[9] Id., May 28, 2015.

Linear Hazards

The authors surveyed peer-reviewed literature on linear hazards and pipelines, and their effects on developable land. Linear hazards include high voltage overhead transmission lines (HVOTL), railroad tracks, major roads and pipelines. These linear hazards have essentially similar effects on residential property: typical property value diminution is up to mid-single digit if housing is within a few hundred feet. A meta-analysis encapsulated in the loss calculation tool "Big Matrix" shows that linear hazards are associated with a 4% loss within 100 feet of houses (Simons, 2005, p. 335). The effect of pipelines on non-residential property is covered in the methodology section, and is generally site-specific.

High voltage overhead electrical transmission lines (HVOTL) are one of common examples of linear hazards. They have a negative amenity value because they are visually unpleasant and inconsistent with a natural setting. They are also associated with empty land in a right of way that can be used for open space and in some cases temporary uses like gardening. The price-discount effects are expected to be stronger when the occupant can see more transmission line infrastructure, such as homes sold near towers, as opposed to simply near the lines between towers. Furthermore, there is the nuisance of line workers doing maintenance, and the very small possibility of a line meltdown, failure or conflagration. Although no definitive studies have connected the HVOTL issue to health problems, there has been a concern for the negative impact on human health since the 1980s.

Colwell (1990), Delaney and Timmons (1992), Des Rossiers (2002), Hamilton and Schwann (1995), Kung and Seagle (1992), and Wolverton and Bottemiller (2003) have all published in this space. The effects of high voltage overhead transmission lines (HVOTLs) on property values are very consistent. Residential property within 100-300 feet of a HVOTL sustained losses of 6-15%, and houses sold 300-600 feet away had losses of 3-7%. Part of the reduction in property value is likely view-related. Land sales also fall within these general findings, as do results from several different parts of the U.S. and Canada.

The second example of linear hazards is a railroad, a mode that is pervasive throughout the US. While watching trains go by from a distance is somewhat entertaining, being up close is a nuisance, and

may subject the residents to noise from trains, whistle blowing, the risk of having an animal or child struck by a train, and a very small potential for a calamitous accident. Therefore, there should be a discount associated with close proximity to both trail road tracks, and gated crossings. Authors active in this area include Bowes and Ihlanfeldt (2001), Simons and el Jaouhari (2004), Strand and Vagnes (2001), Clark (2005), (Keller and Rickley 1993), and Rapoza et al (1998). To summarize, the benefits of railroad transportation in connecting markets are well known, but there is still a trade-off between the need for safety and the need to reduce the level of noise and other nuisances generated by railroad activities. Based on the train studies described above, negative property value effects on residential property are in the single digits for properties within 750 feet of an active track. Changes in the publicized volume of traffic can also be capitalized into the market value, as can proximity to gated train crossings.

Pipeline Literature

With respect to the residential pipeline literature, there are two types of studies: those for residential property on or near an active pipeline easement, and those for (off-easement) properties affected by pipeline ruptures. These effects can be applied formulaically, and represent the expected value of the undesirable potential of a rupture or release event. A summary of peer-reviewed studies of pipelines on residential property concludes that homes on an easement incur a 5% loss, and 2% if within 100-250 feet.

The second type of peer-reviewed study demonstrates losses from relatively rare pipeline release events. Property value losses to these residential properties, if there were an event, are expected to be 10-25%, but the properties that incur these losses are typically off the easement, in a body of water or creek perpendicular to the pipeline corridor. A summary of the literature is presented in Exhibit 2.

Exhibit 2: Highly Relevant Studies on the Effect of Pipelines of House values

Author (Year)	Study Region	Specification of Effect	Main Findings
Simons (1999a)	Fairfax County, Maryland	The effect of 1993 pipeline rupture in Reston, Virginia on non-contaminated, easement-burdened residential property in Fairfax County.	(1) Single-family homes (-5.5%) (2) Townhomes (-2.6%)
Simons (1999b)	Summit County, Ohio	The effects of a long-term pipeline (petroleum) leak on a residential neighborhood.	The long-term petroleum leak that caused localized groundwater contamination in the rural area was found to decrease residential property values upon resale in excess of 25%.
Simons, Winson-Geideman and Mikelbank (2001)	Neighborhoods near Patuxent River in Maryland	Petroleum was released into a river, and traveled as far as 10 miles away both upstream and downstream on both banks of the river.	Significant loss in sales price of affected properties (Approximately 10%)
Hansen et al. (2006)	Bellingham, Washington	The effect of proximity to a major fuel pipeline on housing prices, both before and after a high-profile explosion accident.	No price effect prior to the accident, but a substantial effect after the rupture. (1) 4.6% for a property within 50 feet. (2) 2.3% for a property within 100 feet.
Wilde, Williamson, and Loos (2014)	Clark County, Nevada	The effects of proximity to a natural gas pipeline on residential property values. Compared before and after (1) the initial service, (2) a notice on the policy change, and (3) an accident.	(1) No price effects after the initial service. (2) No price effects after a notice increasing the maximum allowable pressure. (3) No price effect after an accident.

Land Residual Approach to Undeveloped Land

Although this research focuses on the impact of pipelines on residential property values, it should be also noted that as yet undeveloped, developable (e.g., zoned and served with utilities) land could also be affected by negative externalities caused by pipelines. It is generally accepted in the academic literature that the impact of environmental contamination or safety issues on undeveloped property values can be addressed by applying the land residual approach. The general idea of this approach is that developable lots affected by contamination must absorb the full price drop (to developed property) from the contamination, as the construction cost of building a house is fixed (Kinzy 1992; Dowall 1993). If not, no property would

be developed.[10] Thus, a substantial portion of the potential losses relate to uneconomic remnant parcels that result from property being rendered unusable due to the pipeline. The property may be rendered unusable due to loss of access rather than to being contiguous to the pipeline.[11]. This approach can readily be applied to platted developable lots.

Since the useful life and corresponding impact period for this pipeline study is 50 years, and since the City of Green is a finite area undergoing substantial growth, the main impacts could occur well into the future (in one two or three decades), if the pipeline path renders developable parcels, functionally obsolete, creating economic remnants. This would include denying the property road access, or consuming a land buffer (for example, 250 feet from the centerline of the pipeline easement, or 150 feet from the edge). Otherwise developable sites could become stranded and useless, and any future real estate development, and associated jobs and fiscal impacts, would be foregone.

ASSESSMENT OF POTENTIAL EFFECTS TO RESIDENTIAL PROPERTY

Data collection and assigning potential impacts

The research team applied principles determined from the peer-reviewed literature to each parcel considered in the City of Green, Ohio. The study area included 7.7 miles in the City of Green, out of the 100+ mile proposed route. The data sources relied upon include:

- City of Green Property Attributes (Summit County Fiscal Office data provided by City of Green)
- Summit County Property Attributes (Summit County Auditor data provided by City of Green)
- Geo-located list of City of Green-identified residential and commercial/industrial development sites (provided by City of Green)
- City of Green Zoning (provided by the City of Green)
- Property tax rate millage table for Green (provided by the City of Green)
- Property tax rate millage table for Summit County (Summit County Auditor)

[10] Using a hypothetical scenario of a developable lot with a land value of $50,000 in a neighborhood where finished homes would sell for approximately $200,000, we can apply the concept of land residual approach to pipeline studies. If we assume that the contamination caused by a pipeline accident reduces property values by 10%, then the contaminated lot and house, once improved, could sell for only $180,000. However, because construction costs are fixed, the lot can only be improved at a cost (including developer's profit) of $150,000. Thus, the land value must fall from $50,000 to $30,000 to meet the discounted sale price resulting from the pipeline accident. Therefore, the affected land value drops by considerably more than 10% (in this hypothetical situation, by 40%).

[11] Ohio Revised Code 163.59, Policy for Land Acquisition.
"Condemnation and the Uneconomic Remnant" Axley 8/5/13.
http://www.axley.com/publication_article/condemnation-and-the-uneconomic-remnant/

The authors examined residential parcels that fell within 150 feet of the proposed pipeline (from the parcel's nearest lot line). The property value effect of the pipeline was based on different characteristics of each parcel, including: whether the proposed easement would cross the parcel, whether the parcel has an existing residential structure, house distance from the pipeline, lot line distance from the pipeline, whether the parcel is part of an allotment or subdivision (demonstration of the intent to be developed), whether the parcel is earmarked by the City of Green as a potential residential development site, acreage of the parcel, how the pipeline divides the parcel, and the parcel's zoning. Decision rules based on these characteristics are summarized in Exhibit 3.

Exhibit 3: Value Reduction Decision Rules for Residential Properties

	Property Characteristics	**Effect**
A	Directly affected residential parcel with house within 500 feet of pipeline	5% reduction in property value
B	Directly affected residential parcel with house more than 500 feet away	2% reduction in property value
C	Adjacent residential parcel with house within 250 feet of pipeline or lot line within 100 feet of pipeline	2% reduction in property value
D	Directly affected vacant residential parcel with allotment, not rendered unusable by the pipeline	Land residual approach: reduced by 5% of neighboring occupied properties' average value
E	Directly affected vacant residential parcel with allotment that is rendered unusable by the pipeline	100% reduction in property value
F	Directly affected vacant residential parcel with no allotment that is rendered unusable by the pipeline	100% reduction in property value
G	Directly affected parcel with other residential structures	5% reduction in property value
H	Directly affected parcel containing Green-identified residential development site	Reduced by the property value of potential subdivided lots that would be lost due to the pipeline (uneconomic remnant)
I	Directly affected vacant residential parcel	Reduced by the property value of potential subdivided lots that would be lost due to the pipeline (uneconomic remnant)
J	All Other (Timber, agricultural, etc.)	No Reduction

Placing the potential impacts in time

Once the loss amounts were set, the next step was to determine when the potential loss would occur, since undeveloped residential properties have the potential to be substantially affected by the proposed pipeline, they meet the test of an "uneconomic remnant," e.g., properties that have significantly impaired economic viability. Thus, it is necessary to establish the likely time of development of existing and currently

undeveloped residential properties. Hence, a development continuum was created (Exhibit 4) that categorizes each residential property, on a 0-10 scale. Properties given lower numbers on the continuum (developed properties are given a "0") are more "ready to develop" in their current state than those given higher numbers, which may be decades form development. Each stage of the continuum corresponds with an estimate of the number of years out, from present day, when a property is likely to be developed.

Exhibit 4: Development Continuum for Residential and Commercial Properties

Ready to Develop	**0**	Existing developed; financed, written leases (or sales contracts), company site plan, zoned, infrastructure investment, platted, strong market demand	1 year out
	1	Written leases (or sales contracts), company site plan, commitment, zoned, infrastructure investment, platted, strong market demand	2 years out
	2	Company site plan, commitment, zoned, infrastructure investment, platted, strong market demand	3 years out
	3	Commitment, site master planned, zoned, infrastructure investment, platted, medium-strong market demand (*the Study Team recognizes that the development period is often shorter, however conservative estimates are used in this analysis)*	5 years out
	4	Site master planned, zoned, infrastructure investment, platted, medium market demand	7 years out
	5	Zoned, city-planned, infrastructure planning, medium market demand	9 years out
	6	Rural zoning, city-planned, infrastructure planning, medium market demand	11 years out
	7	Infrastructure planning, low-medium market demand	14 years out
	8	Low-medium market demand, raw land	17 years out
	9	Low market demand, raw land	20 years out
Not Ready to Develop	**10**	Inactive market, raw land	30 years out

Note: Strong Market: 1 year increments; Medium Market: 2 year increments; Low Market: 3 year increments; No Market: 10 year increments

Loss of Property Value

As stated above, already-developed residential properties were given continuum values of "0." In Green there are 66 such properties. Applying the different decision rules from Exhibit 3, these parcels with existing housing saw a total current property value reduction of $442,000.

Potential Loss of Property Taxes

Using the assigned development continuum value, the change of development status for each residential property was placed somewhere on a 50-year timeline (the expected lifespan of the pipeline).[12] After residential property value reductions were calculated for each property, corresponding residential property tax losses were calculated for each year on the 50-year timeline. Property tax losses for each year were then converted to their present value and summed across the timeline. The resulting value represents the total property tax losses from residential properties affected by the pipeline. Appendix E shows these tax rates for the three regions, along with other inputs used in the present value calculations.[13]

The present value of the projected property tax losses for residential properties affected by the Nexus pipeline in Green total $18,320,184 over the 50-year timeline. Green Local School District would see the largest reduction ($12,260,891), followed by Summit County ($3,674,262) and Green City ($697,772), with other jurisdictions splitting the remaining PV loss of $1.5 million.

The City of Green also has the ability to collect income taxes from its residents. Accordingly, the Study Team also took into consideration income taxes collected from households that would have resided on the potential subdivided residential lots scrapped due to the pipeline. To determine the total income taxes not collected from these potential households, the City's median household income ($61,665)[14] was multiplied by the number of households (66), an income tax rate of 2%, and an inflation factor of 4.2%.

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[12] According to Nexus, the lifespan for steel pipelines such as that proposed for the Nexus project is "indefinite." Further, "[t]here are many pipelines in the U.S. and Canada that have operated safely for several decades and should be able to continue operating safely for the foreseeable future." *See*: http://www.spectraenergy.com/Safety/Pipeline-SafetPublic-Awareness/Natural-Gas-Pipeline-FAQs/. Based upon this estimate 50 years was chosen as the lifespan of the Nexus pipeline for this Study. Other sources also put the life expectancy for natural gas pipelines at about 50 years. *See e.g.* "Aging Gas Pipe Danger Lurks Under US Homes," CBS News, September 14, 2010. Found at: http://www.cbsnews.com/news/aging-gas-pipe-danger-lurks-under-us-homes/.

[13] The present value calculation uses an inflation rate of 4.2%, or that experienced over the past 50 years (1965-2015). The calculation also uses a discount rate of 2.5%, based on a conservative estimate of the City of Green's bond rate (AAA). See "CPI Inflation Calculator" United States Bureau of Labor Statistics 2015. Http://data.bls.gov/cgi-bin/cpicalc.pl . Property tax rates were obtained from the Summit County Auditor, and total just over 2% of market value per year, of which about 2/3 goes to the local school district.

[14] "Green city, Ohio" United States Census Bureau: American FactFinder Community Facts (2010-2014 American Community Survey 5-Year Estimates). http://factfinder.census.gov/faces/nav/jsf/pages/community_facts.xhtml Note: This value represents the median household income for the City of Green, which differs from the average wage for jobs located within the city used in other portions of the analysis ($47,303).

This figure was then multiplied by 50% to account for households that would or would not be employed within Green. After being placed on the 50-year development timeline and present valued, total income tax losses from residents for the City of Green for the 50 year period total $2,821,113.

ASSESSMENT OF ECONOMIC AND FISCAL EFFECTS TO COMMERCIAL AND INDUSTRIAL PROPERTIES

Property Value Loss Methodology

Property value losses were calculated for commercial and industrial properties affected[15] by the Nexus pipeline in the City of Green using the same methodology as for residential property. In this instance, "property value" is defined as the sum of a parcel's land value and building value as assigned by the Summit County Auditor. Property value losses for commercial and industrial properties largely stem from a parcel's usability for a commercial or industrial purpose, and the hindrance that the pipeline will bring to such a site. Like residential properties that have severely impaired economic viability or development potential, these commercial and/or industrial properties can be deemed "uneconomic remnants." Thus, the authors observed the manner in which the pipeline's proposed easement traversed the properties, taking note of the acreage of the portion of the parcel "cut off" by the pipeline or consumed by the pipeline easement itself (within 150 feet of the centerline). Portions of parcels designated as "cut off" were usually located on the rear or back of properties, away from direct road access.[16] These are uneconomic remnants.

The acreage of a parcel's cut off portion was multiplied by the agricultural value of the land to establish the property's land value reduction. A property's agricultural value is the average value, in dollars per acre, of nearby properties whose land use is defined as agricultural. In this analysis, the agricultural value is set forth as $5,976/acre.

The calculation of a property's building value reduction involved finding the potential building square footage that would be forgone due to the Nexus pipeline. Standard floor area ratios (FAR) were used

[15] This includes commercial and industrial properties that are directly traversed by the proposed pipeline easement.
[16] This analysis assumes that vehicular access over the pipeline's easement would be limited or prohibited.

to establish the maximum building square footage that could be developed on each commercial and industrial property.[17] If the property contained existing buildings, their square footage was subtracted from the maximum square footage to set forth the property's potential building expansion. Next, the total building space that would still be able to be constructed considering the proposed pipeline was calculated. This was found by subtracting the acreage cut off from the property's total acreage.

The square footage that could still be constructed was subtracted from the property's potential expansion to establish the potential building square footage that would be lost due to the pipeline. The resulting figure was then multiplied by $50 to calculate the site's lost building value.[18]

Loss of industrial and commercial property value

A total of 11 commercial and industrial properties affected by the Nexus pipeline were analyzed in the City of Green. Three parcels contained existing buildings that housed industrial or commercial operations while the remaining eight parcels were identified by the City as future commercial and industrial development sites. Three of the future development properties are currently owned by the Akron-Canton Airport Authority. Exhibit 5 displays characteristics of the eleven properties analyzed within Green, and Exhibit 6 shows a map linked to the data.[19]

[17] Floor area ratios compare a building's total floor area to the size of the land upon which it is constructed. A floor area ratio of 0.4 was used for properties that would likely see higher-density development, 0.25 for properties that would likely see medium-density development, and 0.2 for properties that would likely see lower-density development.
[18] Authors based on industry standards.
[19] Based on analysis of commercial and industrial property site maps and photographs.

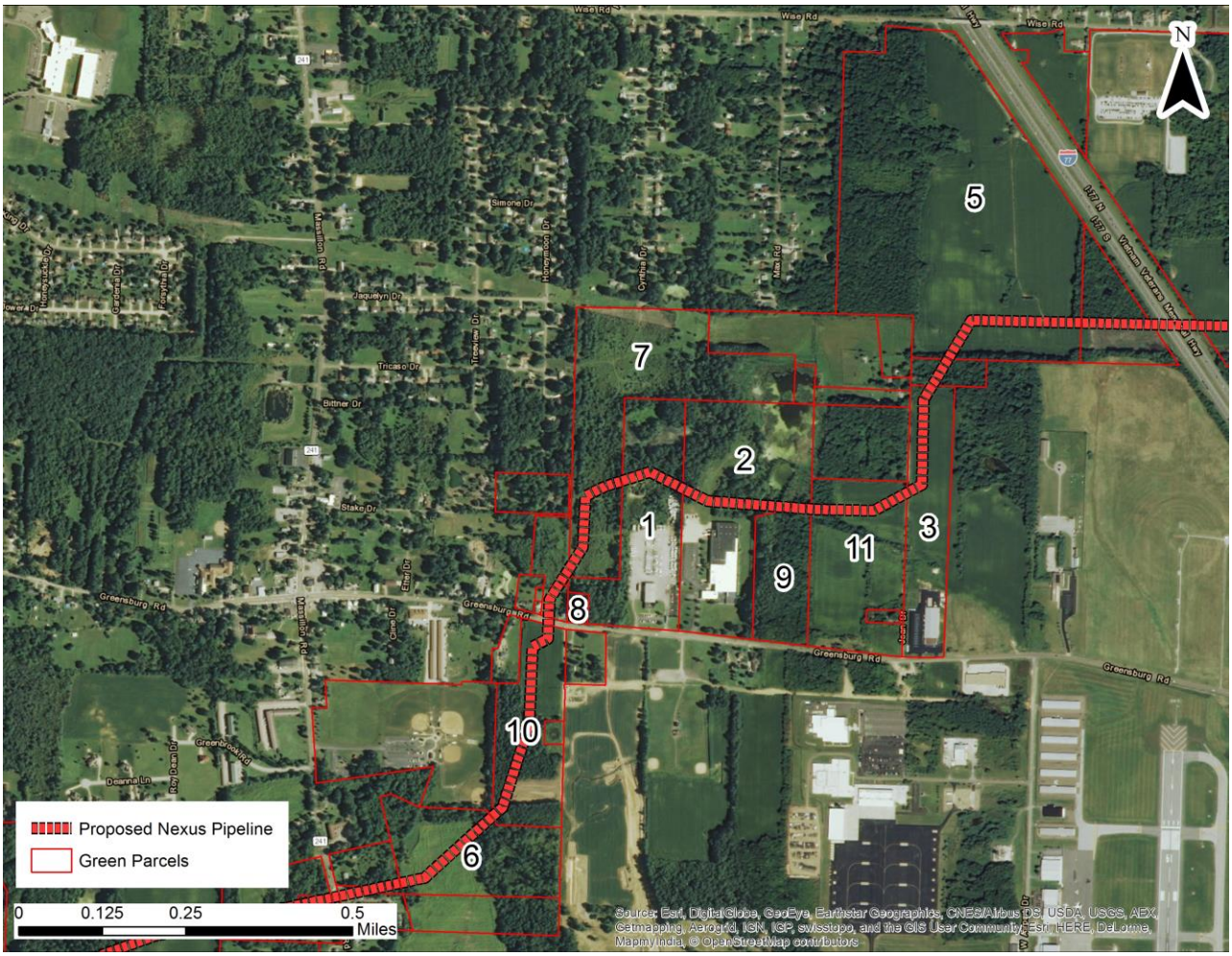
Exhibit 5: Industrial and Commercial Properties in Green, Ohio Affected by the Proposed Pipeline

Map Reference	Parcel	Ownership	Acreage	Acreage Cut Off	Cut Off %	Buildings	Building SF	Continuum Timeframe	Proximate to Airport	Industrial Park
Parcels with Existing Buildings										
1	2803987	NCT Development Corp (North Canton Transfer)	22.51	6.95	30.9%	1	16,985	2	Yes	None
2	2802535	Green Vertical Properties LLC (Canton Elevator)	33.23	18.58	55.9%	1	131,360	1	Yes	None
3	2811552	AKC Development Co (Allen Keith)	16.72	2.12	12.7%	1	30,186	4	Yes	Joan Dr
Parcels with No Existing Buildings										
4**	2805458	Shaffers RE LLC (Western Green)	11.58	3.48	30.1%	0	0	5	No	None
5	2807388	Dehoff Agency Inc (Park Place)	98.49	6.90	7.0%	0	0	4	Yes	Park Place
6	2802955	James & Mildred Helms (Helms Land)	20.38	7.93	38.9%	0	0	5	Yes	None
7	2803988	NCT Development Corp (North Canton Transfer)	13.15*	7.97	60.6%	0	0	2	Yes	None
8	2801554	NCT Development Corp (North Canton Transfer)	0.88	0	0.0%	0	0	2	Yes	None
9	2814683	Akron/Canton Airport Authority (Airport)	10.47	0.06	0.6%	0	0	5	Yes	None
10	2815961	Akron/Canton Airport Authority (Airport)	17.43	17.43	100.0%	0	0	4	Yes	Port Green
11	2804562	Akron/Canton Airport Authority (Airport)	22.91	3.72	16.2%	0	0	5	Yes	Joan Dr

* Excludes northern portion of property which would likely not be developed for commercial or industrial use.

****** Not shown on Exhibit 6 map, parcel is located west of main group.

Exhibit 6: Green Commercial and Industrial Property Overview Map



The total land value lost across the 11 commercial and industrial properties in Green was $449,112. Because the land value losses would be felt immediately after the pipeline would be constructed, the losses were placed at year zero on the 50-year timeline.

Building value losses for commercial and industrial properties were placed on the 50-year timeline based on their designated continuum values. The combined land value losses (beginning at year zero on the timeline) and building value losses (placed on the timeline at years based on continuum value) were summed, resulting in a total property value reduction figure. Land rent losses to the Akron-Canton Airport

Authority were considered but not calculated here.[20] Exhibit 7 shows the property value losses for structures, which drives the property tax fiscal impact figures calculated later.

Exhibit 7: Building Value Reduction for Industrial and Commercial Properties in Green, Ohio Affected by the Nexus Pipeline

Map Reference	Parcel	Ownership	Acreage	FAR	Potential Expansion	Acreage Unaffected	Acreage Cut Off	SF Still Able to Build	Lost Building SF	Lost Building Value***
1	2803987	NCT Development Corp (North Canton Transfer)	23	0.20	179,122	16	7	118,574	60,548	$(3,027,420)
2	2802535	Green Vertical Properties LLC (Canton Elevator)	33	0.20	158,140	15	19	0*	158,140	$(7,906,988)
3	2811552	AKC Development Co (Allen Keith)	17	0.25	151,895	15	2	128,808	23,087	$(1,154,340)
4	2805458	Shaffers RE LLC (Western Green)	12	0.25	126,106	8	3	88,209	37,897	$(1,894,860)
5	2807388	Dehoff Agency Inc (Park Place)	98	0.40	1,716,090	92	7	1,595,864	120,226	$(6,011,280)
6	2802955	James & Mildred Helms (Helms Land)	20	0.25	221,938	12	8	135,581	86,358	$(4,317,885)
7	2803988	NCT Development Corp (North Canton Transfer)	13**	0.20	114,563	5	8	45,128	69,435	$(3,471,732)
8	2801554	NCT Development Corp (North Canton Transfer)	1	0.20	7,667	1	0	7,667	0	
9	2814683	Akron/Canton Airport Authority (Airport)	10	0.40	182,429	10	0	181,384	1,045	$(52,272)
10	2815961	Akron/Canton Airport Authority (Airport)	17	0.40	303,700	0	17	0	303,700	$(15,185,016)
11	2804562	Akron/Canton Airport Authority (Airport)	23	0.40	399,184	19	4	334,367	64,817	$(3,240,864)
	Total		**268**		**3,560,834**	**193**	**75**	**2,635,581**	**925,253**	**$(46,262,657)**

*The property's existing building square footage would exceed the site's FAR for the portion not cut off by the pipeline.
**Does not include northern portion of property, which would likely not be developed for commercial or industrial use.
***Nominal.

[20] For example, a five-acre parcel would have industrial land value of $1-2 per square foot. Therefore, at the upper end of the scale, this parcel would be worth $436,000. Assuming a 5% rate of return, annual land rents not collected would approximate $22,000 for this hypothetical five-acre site, unadjusted for inflation. Thus, the impacts are likely to be fairly small. This further assumes that the land would be leased to industrial tenants at market rates.

Loss of industrial and commercial property taxes

After commercial and industrial property value reductions were calculated for each property, corresponding property tax losses were found for each year on the 50-year timeline. These annual property tax losses were then converted to their present value and summed across the timeline. The resulting value represents the total property tax losses from commercial and industrial properties affected by the Nexus pipeline. This process was completed for each of the three regions, using their differing tax rates.

Property tax losses for commercial and industrial properties affected by the Nexus pipeline in Green total $72,960,476 over the 50-year timeline. Exhibit 8 sets forth a breakdown of the various jurisdictions that would experience the property tax reductions. Green Local School District would see the largest reduction ($48,848,315), followed by Summit County ($14,599,468) and Green City ($2,815,001). This analysis assumes that no tax abatements would be given.

Exhibit 8: Reduction of Property Tax Collected from Commercial and Industrial Properties Affected by the Nexus Pipeline for Taxing Jurisdictions in Green, Ohio, 2016-2065 (Present Value, 2016$)

Summit County	$	(14,599,468)
Green LSD	$	(48,848,315)
Green City	$	(2,815,001)
Portage Lakes JVSD	$	(2,605,552)
Akron Summit Library	$	(2,417,215)
Summit Metro Parks	$	(1,674,926)
Total	**$**	**(72,960,476)**

Loss of income taxes

Income tax losses for commercial and industrial properties affected by the Nexus pipeline in the City of Green were calculated by multiplying acreage of land cut off by the pipeline by an estimated 8.9 employees per acre to find the total employment lost. This figure was then further multiplied by the City's average wage ($47,303)[21] and adjusted for benefits to get total lost labor income. Finally, an income tax

[21] These data based on employment, number of establishments and wages recorded in the Quarterly Census of Employment and Wages - a government program that publishes a quarterly count of employment and wages reported by employers. This data does not include self-employed, student employment, and a few other categories of employment.

rate of 2% was applied to the total labor income. Annual commercial and industrial income tax losses were placed on the 50-year timeline based on corresponding properties' assigned continuum values and were summed to reveal total losses of $45,876,069.

Supply chain and other indirect employment relating to the direct jobs mentioned above would also be lost. Similarly, spending in the economy would create additional jobs (induced employment). Just the induced impact on the economy based upon the lost jobs would amount to a loss of 12 additional jobs in a city annually. Looking at the effects on the economy of the City of Green from 2017 to 2030, the lost induced labor income would likely amount to more than $7 million, accompanied by a loss of production with an output worth about $21.4 million.[22] However neither the indirect or the induced employment losses, and lost income taxes therefrom, have been included in the total income tax losses set forth above.

Construction jobs created from the building of potential commercial and industrial (as well as residential) structures, and the corresponding income tax generated, were also considered in the calculation of Green's total income tax losses. Construction labor costs were assumed to be 42% of total building value (for commercial and industrial properties) and property value (for residential properties).[23] Like the other income tax calculations, the tax rate was set at 2%. Residential construction job income tax losses for Green were $130,041 over the 50-year timeline and commercial and industrial construction job income tax losses were $413,847. At peak buildout, an estimated 670 jobs would be affected. Added to the future households' income tax, the present value of the City's total of income tax losses comes to $49,241,070.

[22] To assess the potential losses in employment, labor income and output, the 2015 IMPLAN model and data package were used for Summit County, Ohio. The results were scaled back to the share of the City of Green's economy within the county (about 5.8%). Indirect labor income was not calculated, since it is uncertain as to what the industries would be located in the City of Green.

[23] Simons, Robert A. and Sharkey, David S. "Jump-Starting Cleveland's New Urban Housing Markets: Do the Potential Fiscal Benefits Justify the Public Subsidy Costs?" 1997. http://www.rasimons.com/documents/articles/jumpstarting-clevelands-urban-housing-markets.pdf

POTENTIAL BENEFICIAL FISCAL IMPACTS FROM THE NEXUS PIPELINE

Pipelines also pay property taxes, so to some extent losses from property devaluation and lost development will be offset by gains in pipeline ad valorem taxes.[24] Property taxes for pipelines are based upon an allocation of the total cost of building the pipeline through the taxing jurisdiction. In Ohio, the average personal property tax for utilities is approximately 6 percent of the value of the assessed property.[25]

The property tax base of public utilities like interstate pipelines consists of all tangible personal property owned and located in Ohio on December 31 of the preceding year. Real property includes land and improvements, while personal property includes all plant and equipment owned by the utility. True value is determined by the capitalized cost less the composite annual allowances, which varies according to the age and expected life of the property.[26]

The taxable personal property values of the utilities are apportioned among the various taxing districts in which the property resides. For natural gas transportation companies, taxable value is apportioned according to the cost of all taxable personal property physically located in each taxing district as a proportion of the total cost of all such personal property located in the state.[27]

Ad valorem taxes are assessed yearly. However unlike for residential property taxes, the values go down over time due to depreciation. In Ohio the pipeline depreciation is determined based upon a fixed decline rate until it reaches 15%, after which it remains constant for so long as the pipeline is in use.[28]

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[24] An ad valorem tax is a tax levy that is apportioned among taxpayers according to the value of each taxpayer's property. Property taxes are a form of ad valorem taxes. *See e.g.* C. Comeaux, "Louisiana Property Tax Basics," Lafayette Parish Assessor, at: http://www.lafayetteassessor.com/topicspdfs/louisiana%20property%20tax%20basics%20booklet%203.pdf.

[25] *See*, "How Ohio Stacks up on Taxation of Oil and Gas Operations, Ohio Oil and Gas Law Report, December 27, 2012, Porter Wright, found at: www.ohiomfg.com/wp-content/uploads/2014-11-21_lb_energy_Rover-Pipeline-Presentation.pdf.

[26] Public Utility Property Tax, http://www.tax.ohio.gov/portals/0/communications/publications/annual_reports/2007_annual_report/public_utility_property_tax_07.pdf

[27] *Id*.

[28] Communication with Ohio Department of Taxation. Fifteen years is the standard depreciation rate normally allowed by the federal government for interstate pipelines, and is used for pipeline revenue calculations in this study. *See 2008 CCH Master Depreciation Guide* (paragraph 110), found at: https://books.google.com/books?id=--pLHsdfhEoC&pg=PA100&lpg=PA100&dq=natural+gas+transportation+pipeline+depreciation&source=bl&ots=ZrSmNiKGiD&sig=3a00GSWgH5gSRL7nqF9q6I7DIF0&hl=en&sa=X&ved=0ahUKEwifvNj-0N7KAhXGVh4KHRbGA-wQ6AEIUzAI#v=onepage&q=natural%20gas%20transportation%20pipeline%20depreciation&f=false. *See also*:

The taxes are not assessed until after the pipeline is built and the capital costs fixed. However experts have estimated the tax to be about $235,000/mile for the Nexus Pipeline the first year.[29] Using this estimate, and based upon the mileage for the proposed pipeline in the City of Green (7.7 miles), we can estimate the likely tax revenue from the pipeline to the taxing entity. An estimate for 50 years, which includes depreciation at a constant rate until it reaches 15%, indicates that the City of Green would receive a present value (2016 dollars) of $674,450 in tax revenues from construction and operation of the pipeline.[30]

Net Fiscal Impacts for the City of Green

The City of Green, of course, only gets a small portion of this and other property taxes paid by those who have real property or utilities with physical assets in the city. Exhibit 9 displays the overall fiscal effects of the proposed Nexus pipeline through the City of Green between 2016 and 2065. Income taxes foregone dominates fiscal picture. Total property tax reductions and total income tax reductions were summed to create a total tax loss figure of $52,753,843. Subtracting the revenue that the City would receive from the pipeline leaves a total (net present value) negative impact of $52,079,393[31]. As a comparison, the annual expenditure budget for the City of Green in 2015 was $32.0 million[32]. Thus, the present value of the foregone tax revenues ($52.1 million) represents a substantial amount[33].

"Seven-year Depreciation for Natural Gas Pipeline," Accounting Today, January 1, 2004, (noting that the Clajon Gas Company case only changes the depreciation rate for gathering lines), found at: http://www.accountingtoday.com/prc_issues/2004_1/6612-1.html.

[29] J. Stewart, "Ohio's Good Luck: New Pipelines to Generate Estimated $256 Million in Tax Revenues," *Energy In Depth*, October 29, 2015, found at: www.spectraenergy.com/Operations/New-Projects-and-Our-Process/New-Projects-in-US/NEXUS-Gas-Transmission/. The actual personal property tax assessed may vary from jurisdiction to jurisdiction. This study has assumed that local property tax rates reflect state averages.

[30] For purposes of this analysis the Study Team assumed that utility gross receipt taxes do not affect local jurisdictions. Gross receipt taxes are triggered by an intrastate transaction between the utility and the distribution company or the end user. However, these taxes are paid to the state and not the local jurisdictions.

[31] Although we stand by the reasonableness of our assumptions, the Study Team nevertheless conducted a sensitivity analysis of the pipeline's fiscal effects on the City using an inflation rate of 2.5% (instead of 4.2%) over the 50-year timeline. This analysis revealed total tax losses of $33,290,097 and a net total negative impact of $32,615,647, inclusive of pipeline revenues. Thus, it is evident that there would be very large losses regardless of what inflation factors are assumed.

[32] http://www.cityofgreen.org/finance

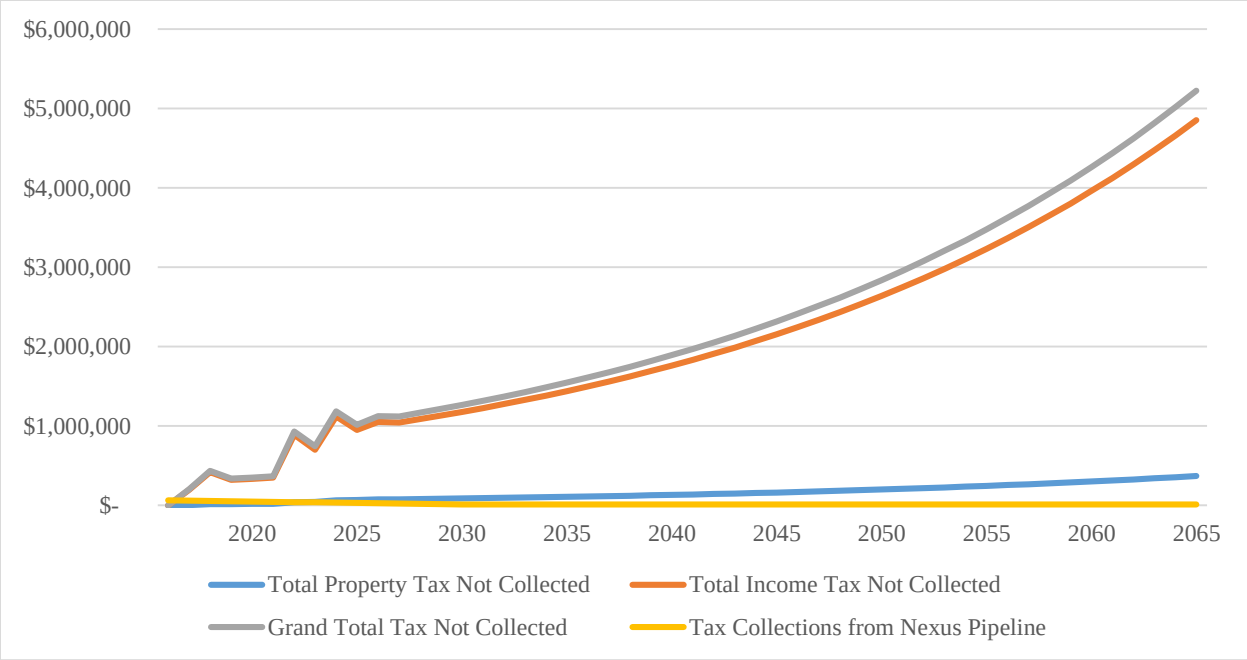
[33] While it is challenging to directly compare these figures, consider the following illustration: If the average present value amount was spread over all 50 years, it would equal just over $1 million a year. This would represent about 3% of the current annual budget, a substantial impact, emanating from just from this one pipeline siting decision.

Exhibit 9: City of Green Fiscal Summary, 2016-2065 (Present Value, 2016$)

Residential Property Tax Reduction	$	(697,772)
Industrial Property Tax Reduction	$	(2,347,279)
Commercial Property Tax Reduction	$	(467,722)
Future Households Income Tax Reduction	$	(2,821,113)
Commercial and Industrial Income Tax Reduction	$	(45,876,069)
Construction Job Income Tax Reduction	$	(543,888)
Total Tax Reduction	**$**	**(52,753,843)**
Revenues from Pipeline	**$**	**674,450**
Net Total Impact	**$**	**(52,079,393)**

Exhibit 10 shows the same data in a line graph, using nominal dollars.

Exhibit 10: Annual City of Green Property Tax Reduction and Pipeline Revenue Comparison (City Tax Collection Only), 2016-2065 (Nominal)



The picture illustrates the negative cumulative effect of a long hold period. City revenues losses are dominated by the income tax. Because the city receives such a small portion of the property tax, the pipeline revenues are net positive only for the first year or so, then gradually diminish, until after about 5

years potential losses to tax collections vastly outweigh the negligible benefits from a largely depreciated pipeline.

Moving to the effect of all taxing jurisdictions within the City, Exhibit 11 provides an overview of the proposed pipeline's net fiscal impacts on all taxing jurisdictions within Green.[34] The fiscal effects of the pipeline on all taxing jurisdictions within Green include overall losses of $122,813,868, summing property and income tax losses and subtracting pipeline revenue of $17.7 million.

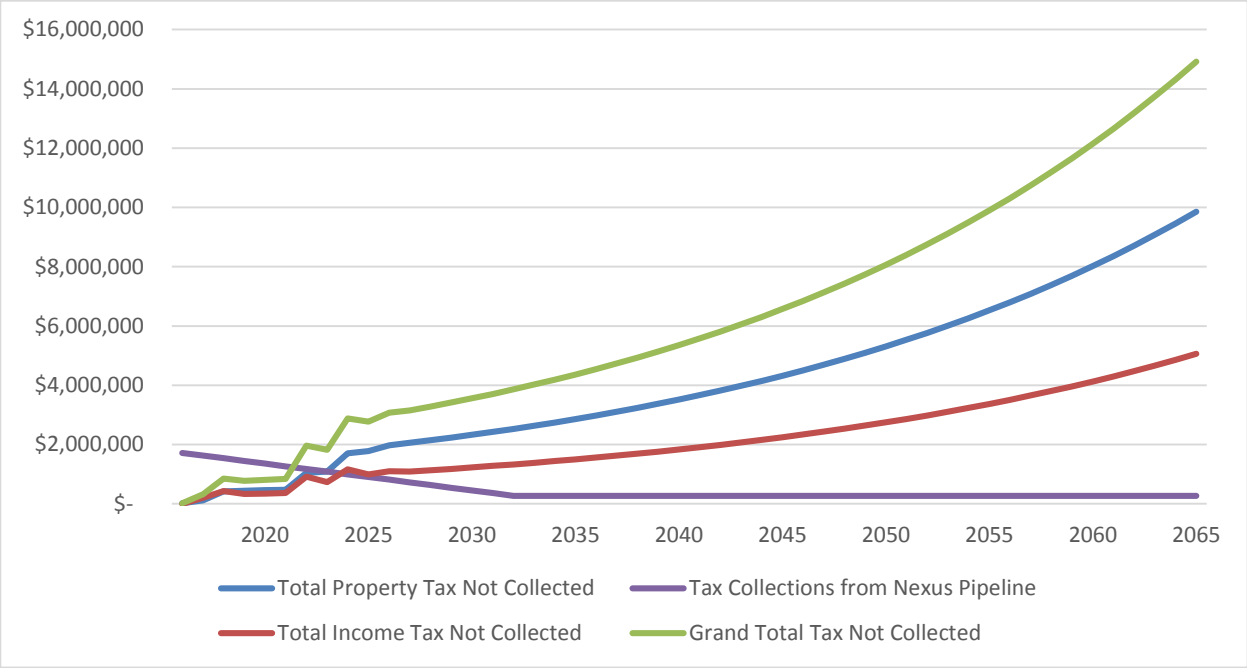
Exhibit 11: Summary of Total Tax Collection Losses for Taxing Jurisdictions within Green, 2016-2065 (Present Value, 2016$)

Summit County Property Tax Red.	$(18,273,730)
Green LSD Property Tax Red.	$(61,109,206)
Green City Property Tax Red.	$(3,512,773)
Portage Lakes JVSD Property Tax Red.	$(3,257,919)
Akron Summit Library Property Tax Red.	$(3,027,685)
Summit Metro Parks Property Tax Red.	$(2,099,348)
Total Property Tax Reduction	**$(91,280,661)**
Total Income Tax Reduction	**$(49,241,070)**
Revenues from Pipeline	**$17,707,863**
Net Total Impact	**$(122,813,868)**

Exhibit 12 similarly shows a nominal comparison of annual tax losses and pipeline revenue for all taxing jurisdictions within the City between 2016 and 2065. These potential revenue losses are much more dependent on property taxes. The graph exhibits a similar pattern, although the scale is much larger, to reflect losses primarily from the local school district. These figures show that despite early revenue gains from the Nexus pipeline, tax losses (including property and income) equal these gains after about 5-7 years. After the pipeline is mostly depreciated in 15 years, potential revenue loss vastly outweighs short-term gains for the balance of the study period.

[34] Taxing jurisdictions within the City of Green include Summit County, Green LSD, Portage Lakes JVSD, Akron Summit Library, Summit Metro Parks, and the City itself.

Exhibit 12: Annual City of Green Property Tax Reduction and Pipeline Revenue Comparison (All Taxing Jurisdictions), 2016-2065 (Nominal)



CONCLUSIONS

In 2015 Nexus announced plans to build 250 miles of high-pressure natural gas transmission pipeline that would run from northeastern Ohio into Michigan, and ultimately Ontario, Canada. The pipeline route proposed takes it through one of Ohio's fastest growing communities: the City of Green (in Summit County). The path proposed by Nexus would cause the City of Green to disproportionately bear the burden of anticipated economic losses and reduction in tax revenue associated with the pipeline.

In the last 20 years, Green's population has grown by 34% (to 25,669), compared to 4.5% for Ohio. Green has a projected per capita effective buying income of 118% of the national average, and has received a "AAA/Stable" rating for its long-term bonds, reflecting Standard and Poor's view that the community's economy is strong and growing. It is also home to the Akron-Canton regional airport, making the region particularly attractive to new industrial and commercial development. The proposed pipeline route would cut through a substantial part of the industrial district proximate to the airport.

If the pipeline were built along Nexus' proposed path, the City of Green would suffer substantial diminution in property value along the pipeline route. This would in turn lead to a reduction of around

$3,500,000 (2016 dollars) in tax revenue for the city, which revenue would not be offset by the ad valorem tax that would likely be collected ($674,450) from the pipeline company for the same 50 year period. Property value diminution relates to both anticipated losses associated with pipeline proximity, and to the creation of uneconomic remnants resulting from the loss of access to a number of commercial, industrial and residential properties.

The proposed pipeline path would also lead to losses in income taxes for the City of Green. Green collects a 2% income tax from both its residents and from workers in the city of Green. Both would be affected; homes would not be built as a result of the pipeline, and businesses would not be developed. The total loss in income taxes collected over 50 years is expected to be substantial. Net loss, after offsetting the taxes received from the pipeline company, for the City of Green would be around $52 million, present value. This number does not include income tax losses generated from indirect or induced employment.

The above analysis on the fiscal and economic impacts of the proposed Nexus pipeline reveal likely large tax losses not only for the City of Green itself, but also for its corresponding taxing jurisdictions. For all taxing jurisdictions within Green, losses are projected to total over $123 million, present value, about 2/3 of which would be absorbed by the City's local school district.

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APPENDIX A. ABOUT THE STUDY TEAM

Robert A. Simons, Ph.D.

Robert A. Simons is a Professor at the Levin College of Urban Affairs at Cleveland State University in Cleveland, Ohio. He is also the faculty advisor for the Certificate Program in Real Estate Development and Finance, offered in conjunction with the Nance College of Business at CSU. His is the former director of the Master of Urban Planning, Design and Development program. During Fall 2005, Dr. Simons was a Fulbright Scholar at Wits University in Johannesburg, South Africa. He has also been a Lady Davis Scholar at the Technion (1999 and 2010-11). Dr. Simons received his Ph.D. from the University of North Carolina at Chapel Hill in City and Regional Planning, with an emphasis in real estate. He also holds a Master of Regional Planning and a Master of Science in Economics, both from U.N.C. His undergraduate degree in anthropology was earned at Colorado State University. He was a member of the American Institute of Certified Planners (AICP) from 1983-2009. Dr. Simons is in the inner leadership group of the American Real Estate Society (ARES), and was program chair in 2009-2010, through President in 2011-2012.

At the Levin College of Urban Affairs, Dr. Simons teaches courses in real estate development, market analysis and finance, public economics, Ph.D. research methods, environmental finance and megacities of Asia. Dr. Simons has published over 60 articles and book chapters on real estate, urban redevelopment, environmental damages, sustainable real estate, housing policy and brownfields redevelopment. He authored a book entitled Turning Brownfields into Greenbacks, (published by Urban Land Institute), and When Bad Things Happen to Good Property, (published by Environmental Law Institute in 2006), and was the lead editor for an international research monograph on Indigenous Property and Valuation (2008, ARES). Another Adaptive Reuse book is in press at the Kent State University press. He serves as Associate Editor for the Journal of Sustainable Real Estate. Dr. Simons has an active consulting practice, and has served as an expert witness in over 80 matters related to real estate, housing markets, and environmental contamination, including over 30 depositions and several trial appearances.

Andrew R. Thomas, J.D.

Andrew Thomas is an Executive-in-Residence with the Energy Policy Center in the Maxine Goodman Levin College of Urban Affairs of Cleveland State University where he researches oil and gas regulation and law. His research also includes electricity markets and regulation. He was formerly a geophysicist with Shell Oil Company, and has been a practicing energy lawyer in Louisiana and Ohio for the past 20 years. He serves as counsel to the university facilities management and is adjunct to the Cleveland Marshall School of Law and the College of Urban Affairs, where he teaches courses in energy law and policy. He also teaches oil and gas contracting courses internationally. a.r.thomas99@csuohio.edu, 216-687-9304.

Iryna Lendel, Ph.D.

Dr. Iryna V. Lendel is an economist with experience in conducting academic and applied research as well as analyzing regional economic development. Her research portfolio includes projects on industrial analysis (high-tech industries, the oil and gas industry, steel industry and the re-emerging optics industry); technology-based economic development; and the energy policy and economics. Dr. Lendel is the Research Associate Professor of Economic Development and Assistant Director of the Center for Economic Development at the Maxine Goodman Levin College of Urban Affairs at Cleveland State University.

Dr. Lendel is affiliated with the Center for Energy Policy and Applications at Cleveland State University. Dr. Lendel was a principal co-investigator on a project assessing the economic impact of the Utica Shale development on the State of Ohio. She is a principal investigator of the current study on the potential opportunities on downstream, midstream and upstream industries resulting from further development of Ohio Utica shale resources and shale gas industry in Ohio and Pennsylvania. She is an assistant editor of Economic Development Quarterly and a Member of Editorial Board of International Shale Gas and Oil Journal; and she is a frequent guest blogger at Crain's Ohio Energy Report. i.lendel@csuohio.edu, 216-875-9967.

Bryan Townley

Bryan Townley primarily worked with the geographic information systems (GIS) and cartographic portions of this project. Townley is a graduate research assistant with the Center for Economic Development and is a graduate student in the Urban Planning and Development program at the Maxine Goodman Levin College of Urban Affairs.

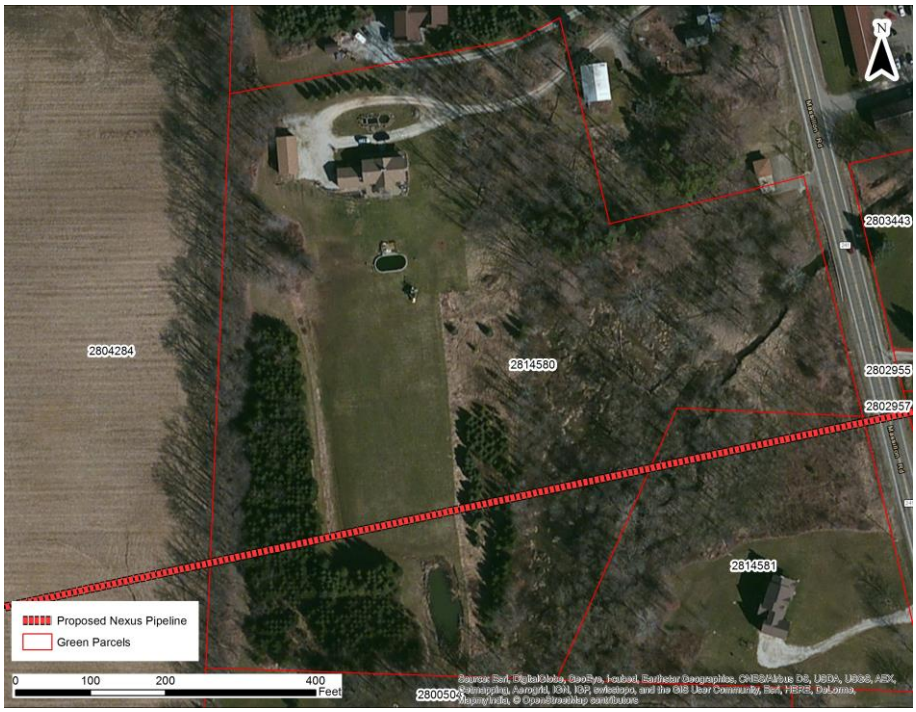
APPENDIX B. VALUE REDUCTION DECISION RULES DETAIL

Appendix Table B-1. Value Reduction Decision Rules

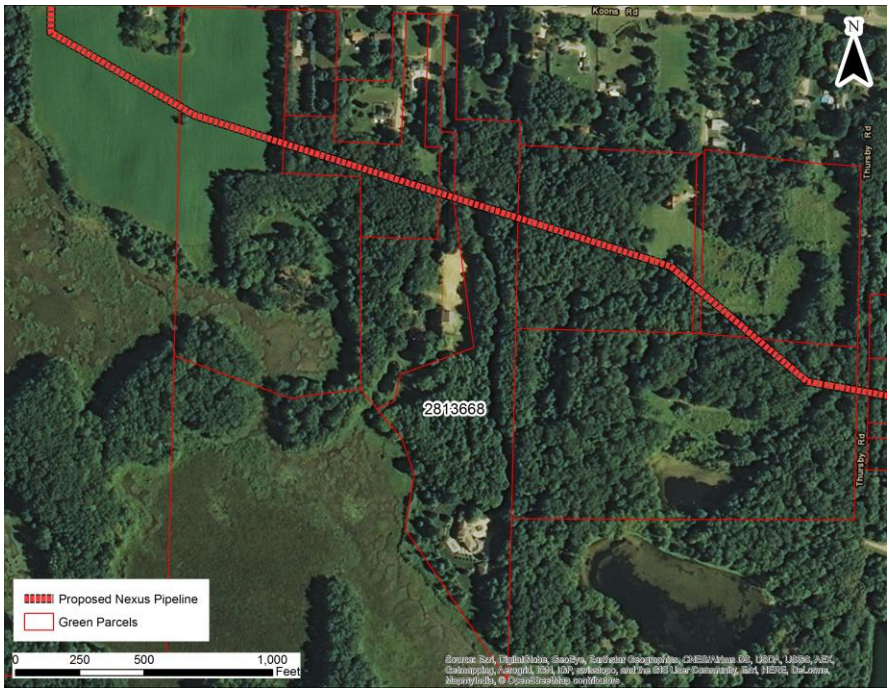
	Property Characteristics	Effect
A	Directly affected residential parcel with house within 500 ft of pipeline	5% reduction in property value
B	Directly affected residential parcel with house more than 500 ft away	2% reduction in property value
C	Adjacent residential parcel with house within 250 ft of pipeline or lot line within 100 ft of pipeline	2% reduction in property value
D	Directly affected vacant residential parcel with allotment, not rendered unusable by the pipeline	Land residual approach: reduced by 5% of neighboring occupied properties' average value
E	Directly affected vacant residential parcel with allotment that is rendered unusable by the pipeline	100% reduction in property value
F	Directly affected vacant residential parcel with no allotment that is rendered unusable by the pipeline	100% reduction in property value
G	Directly affected parcel with other residential structures	5% reduction in property value
H	Directly affected parcel containing Green-identified residential development site	Reduced by the property value of potential subdivided lots that would be lost due to the pipeline (uneconomic remnant)
I	Directly affected vacant residential parcel	Reduced by the property value of potential subdivided lots that would be lost due to the pipeline (uneconomic remnant)
J	All Other (Timber, agricultural, etc.)	No Reduction

* No property example

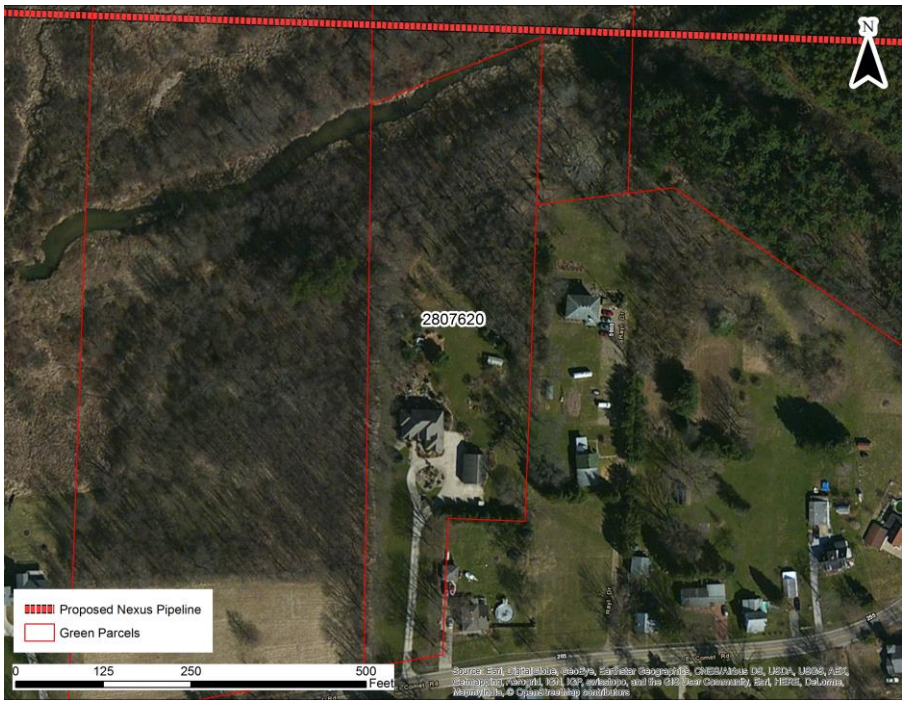
Appendix Figure B-1. Property Type A Example (Directly affected residential parcel with house within 500ft of pipeline)



Appendix Figure B-2. Property Type B Example (Directly affected residential parcel with house more than 500ft away)



Appendix Figure B-3. Property Type C Example (Adjacent residential parcel with house within 250ft of pipeline or lot line within 100ft of pipeline)

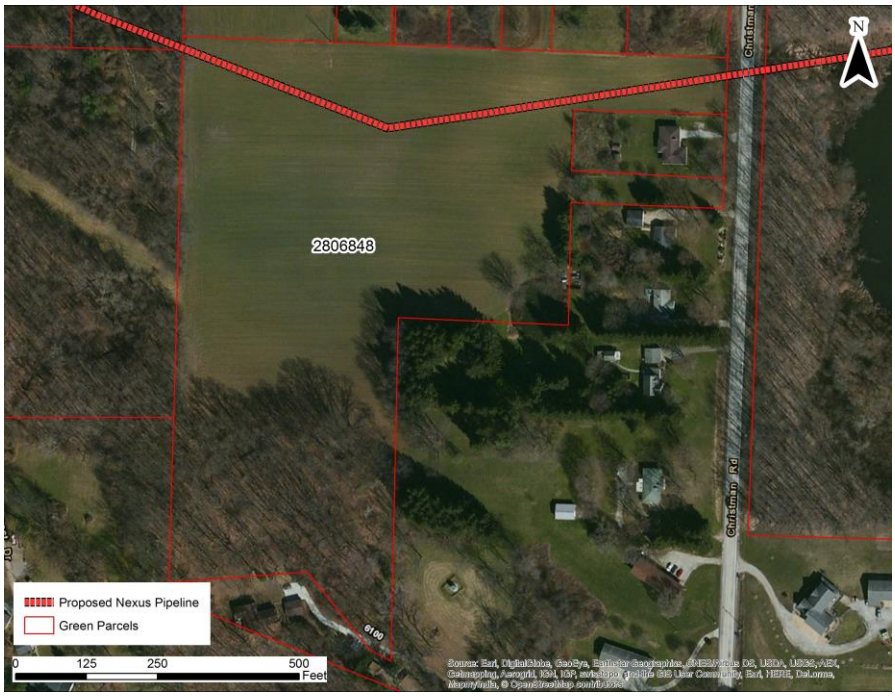


Appendix Figure B-4. Property Type D Example (Vacant residential parcel with allotment, building site fits on property)

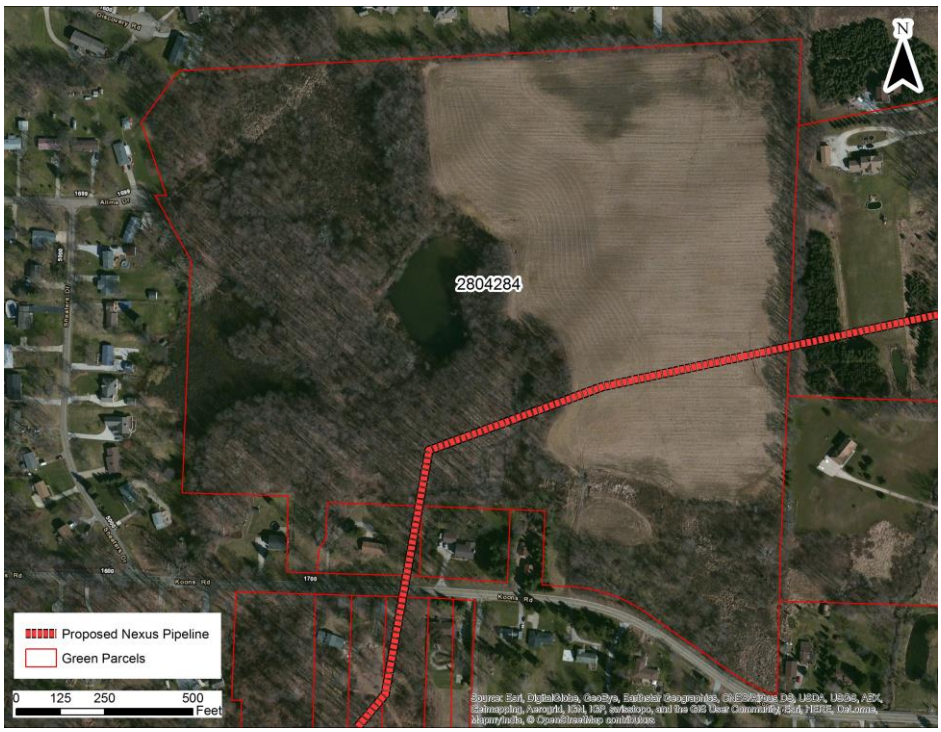
Appendix Figure B-5. Property Type E Example (Vacant residential parcel with allotment, building site does not fit on property)

Appendix Figure B-6. Property Type G Example (Directly affected parcel with other residential structures)

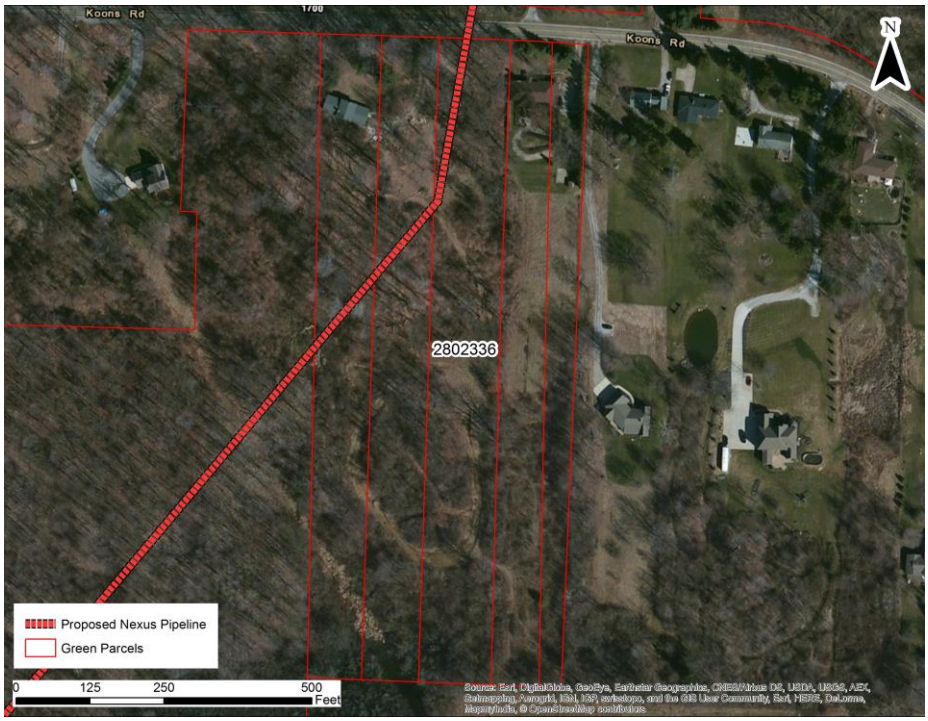
Appendix Figure B-7a. Property Type H Example (Directly affected parcel containing Green-identified residential development site) (Cut Off- "Uneconomic Remnant")



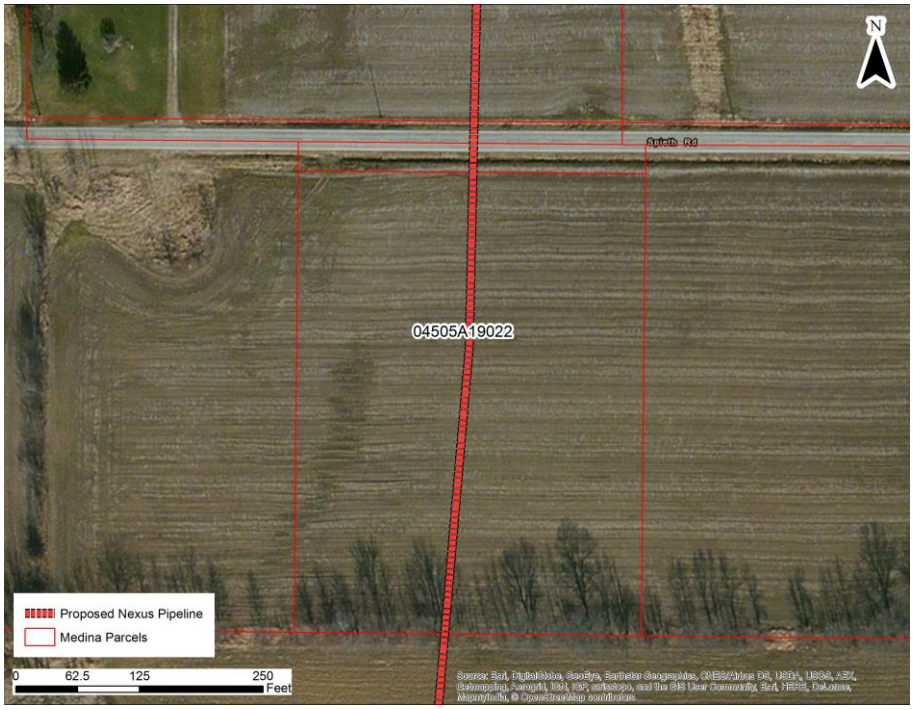
Appendix Figure B-7b. Property Type H Example (Directly affected parcel containing Green-identified residential development site) (Split)



Appendix Figure B-8a. Property Type I Example (Directly affected vacant residential parcel) (Cut Off- "Uneconomic Remnant")



Appendix Figure B-8b. Property Type I Example (Directly affected vacant residential parcel) (Split)



APPENDIX C. RESIDENTIAL PROPERTY VALUE REDUCTION DETAIL

Appendix Table C-1. Single Family Residential Properties on Proposed Easement (Green)

PPN	Land Use	Value	Acreage	Value Per Acre	House Site Acreage	House Site Value	House Dist from Pipe	Lot Line Dist from Pipe	Value Reduction	Method Used	Continuum
2813668	Single-Family Residential	$ 921,410	14.55	$ 63,325	N/A	N/A	1160	N/A	$ 18,428	2% Reduction	0
2802798	Single-Family Residential	$ 110,450	7.95	$ 13,898	N/A	N/A	833	N/A	$ 2,209	2% Reduction	0
2801729	Single-Family Residential	$ 218,790	7.81	$ 28,020	N/A	N/A	791	N/A	$ 4,376	2% Reduction	0
2806662	Single-Family Residential	$ 142,630	5.51	$ 25,868	N/A	N/A	623	N/A	$ 2,853	2% Reduction	0
2812218	Single-Family Residential	$ 73,590	7.93	$ 9,277	N/A	N/A	596	N/A	$ 1,472	2% Reduction	0
2805433	Single-Family Residential	$ 169,810	10.60	$ 16,020	N/A	N/A	563	N/A	$ 3,396	2% Reduction	0
2809770	Single-Family Residential	$ 163,330	5.16	$ 31,646	N/A	N/A	494	N/A	$ 8,167	5% Reduction	0
2801438	Single-Family Residential	$ 119,160	4.98	$ 23,936	N/A	N/A	464	N/A	$ 5,958	5% Reduction	0
2814580	Single-Family Residential	$ 286,650	11.70	$ 24,501	N/A	N/A	439	N/A	$ 14,333	5% Reduction	0
2810156	Single-Family Residential	$ 130,750	4.93	$ 26,523	N/A	N/A	422	N/A	$ 6,538	5% Reduction	0
2808279	Single-Family Residential	$ 294,630	11.98	$ 24,591	N/A	N/A	341	N/A	$ 14,732	5% Reduction	0
2804256	Single-Family Residential	$ 135,820	2.35	$ 57,773	N/A	N/A	337	N/A	$ 6,791	5% Reduction	0
2815598	Single-Family Residential	$ 292,840	3.93	$ 74,451	N/A	N/A	318	N/A	$ 14,642	5% Reduction	0
2815597	Single-Family Residential	$ 238,410	4.92	$ 48,444	N/A	N/A	297	N/A	$ 11,921	5% Reduction	0
2810023	Single-Family Residential	$ 243,000	5.34	$ 45,509	N/A	N/A	268	N/A	$ 12,150	5% Reduction	0
2807260	Single-Family Residential	$ 233,740	22.59	$ 10,348	N/A	N/A	208	N/A	$ 11,687	5% Reduction	0
2803873	Single-Family Residential	$ 87,230	2.37	$ 36,825	N/A	N/A	208	N/A	$ 4,362	5% Reduction	0

PPN	Land Use	Value	Acreage	Value Per Acre	House Site Acreage	House Site Value	House Dist from Pipe	Lot Line Dist from Pipe	Value Reduction	Method Used	Continuum
2803381	Single-Family Residential	$ 99,460	1.32	$ 75,111	N/A	N/A	194	N/A	$ 4,973	5% Reduction	0
2811362	Single-Family Residential	$ 316,510	6.26	$ 50,575	N/A	N/A	173	N/A	$ 15,826	5% Reduction	0
2814581	Single-Family Residential	$ 187,480	3.13	$ 59,820	N/A	N/A	170	N/A	$ 9,374	5% Reduction	0
2806993	Single-Family Residential	$ 147,040	10.33	$ 14,231	N/A	N/A	157	N/A	$ 7,352	5% Reduction	0
2815850	Single-Family Residential	$ 187,090	5.30	$ 35,297	N/A	N/A	147	N/A	$ 9,355	5% Reduction	0
2802334	Single-Family Residential	$ 58,900	2.43	$ 24,256	N/A	N/A	140	N/A	$ 2,945	5% Reduction	0
2812220	Single-Family Residential	$ 119,090	0.79	$ 149,918	N/A	N/A	140	N/A	$ 5,955	5% Reduction	0
2800897	Single-Family Residential	$ 107,540	2.50	$ 42,977	N/A	N/A	115	N/A	$ 5,377	5% Reduction	0
2809077	Single-Family Residential	$ 112,200	3.37	$ 33,301	N/A	N/A	113	N/A	$ 5,610	5% Reduction	0
2806256	Single-Family Residential	$ 84,090	0.90	$ 93,764	N/A	N/A	97	N/A	$ 4,205	5% Reduction	0
2803443	Single-Family Residential	$ 138,540	3.67	$ 37,756	N/A	N/A	96	N/A	$ 6,927	5% Reduction	0
2813317	Single-Family Residential	$ 211,680	2.82	$ 74,971	N/A	N/A	84	N/A	$ 10,584	5% Reduction	0
2800730	Single-Family Residential	$ 109,550	1.23	$ 89,191	N/A	N/A	75	N/A	$ 5,478	5% Reduction	0
2804274	Single-Family Residential	$ 125,300	6.02	$ 20,813	N/A	N/A	57	N/A	$ 6,265	5% Reduction	0
2802420	Other Residential	$ 145,660	21.89	$ 6,655	N/A	N/A	286	N/A	$ 7,283	5% Reduction	0
Total		**$ 6,012,370**	**206.57**						**$ 251,518**		

Appendix Table C-2. Single Family Residential within 150 feet of Pipeline Easement Centerline (Green)

PPN	Land Use	Value	Acreage	Value Per Acre	House Site Acreage	House Site Value	House Dist from Pipe	Lot Line Dist from Pipe	Value Reduction	Method Used	Continuum
2803687	Single-Family Residential	$ 105,270	2.44	$ 43,087	N/A	N/A	944.48	142.60	$ -	None	0
2800723	Single-Family Residential	$ 150,390	2.94	$ 51,226	N/A	N/A	620.38	124.25	$ -	None	0
2803011	Single-Family Residential	$ 145,050	4.82	$ 30,121	N/A	N/A	601.29	147.96	$ -	None	0
2807620	Single-Family Residential	$ 264,540	3.98	$ 66,421	N/A	N/A	546.02	9.07	$ 5,291	2% Reduction	0
2803078	Single-Family Residential	$ 65,490	1.00	$ 65,271	N/A	N/A	532.80	125.53	$ -	None	0
2800287	Single-Family Residential	$ 77,800	1.00	$ 77,539	N/A	N/A	513.49	108.02	$ -	None	0
2801088	Single-Family Residential	$ 144,810	9.20	$ 15,736	N/A	N/A	507.94	74.19	$ 2,896	2% Reduction	0
2800290	Single-Family Residential	$ 112,560	1.10	$ 102,165	N/A	N/A	463.38	107.60	$ -	None	0
2805105	Single-Family Residential	$ 92,360	1.47	$ 62,801	N/A	N/A	449.59	65.44	$ 1,847	2% Reduction	0
2805103	Single-Family Residential	$ 94,630	2.01	$ 47,063	N/A	N/A	422.80	31.13	$ 1,893	2% Reduction	0
2804551	Single-Family Residential	$ 111,510	4.15	$ 26,862	N/A	N/A	372.93	106.83	$ -	None	0
2808304	Single-Family Residential	$ 180,200	2.32	$ 77,770	N/A	N/A	302.69	119.74	$ -	None	0
2800504	Single-Family Residential	$ 230,480	10.10	$ 22,818	N/A	N/A	279.20	135.65	$ -	None	0
2804727	Single-Family Residential	$ 100,620	14.18	$ 7,094	N/A	N/A	278.74	125.07	$ -	None	0
2807501	Single-Family Residential	$ 175,780	2.06	$ 85,283	N/A	N/A	262.23	153.68	$ -	None	0
2806234	Single-Family Residential	$ 85,310	0.75	$ 113,242	N/A	N/A	221.77	130.82	$ 1,706	2% Reduction	0
2804189	Single-Family Residential	$ 65,000	1.86	$ 34,901	N/A	N/A	213.62	102.06	$ 1,300	2% Reduction	0
2803041	Single-Family Residential	$ 91,150	2.19	$ 41,592	N/A	N/A	202.97	99.40	$ 1,823	2% Reduction	0

PPN	Land Use	Value	Acreage	Value Per Acre	House Site Acreage	House Site Value	House Dist from Pipe	Lot Line Dist from Pipe	Value Reduction	Method Used	Continuum
2802572	Single-Family Residential	$ 113,070	3.05	$ 37,073	N/A	N/A	180.80	144.31	$ 2,261	2% Reduction	0
2806965	Single-Family Residential	$ 67,430	2.37	$ 28,404	N/A	N/A	176.46	106.70	$ 1,349	2% Reduction	0
2804317	Single-Family Residential	$ 149,210	4.16	$ 35,886	N/A	N/A	173.01	126.18	$ 2,984	2% Reduction	0
2802925	Single-Family Residential	$ 115,740	1.09	$ 106,671	N/A	N/A	161.47	88.75	$ 2,315	2% Reduction	0
2805737	Single-Family Residential	$ 108,960	0.37	$ 293,837	N/A	N/A	143.02	93.89	$ 2,179	2% Reduction	0
2803022	Single-Family Residential	$ 124,170	0.36	$ 341,742	N/A	N/A	137.78	96.84	$ 2,483	2% Reduction	0
2804336	Single-Family Residential	$ 58,140	2.60	$ 22,323	N/A	N/A	136.03	129.28	$ 1,163	2% Reduction	0
2803920	Single-Family Residential	$ 135,280	1.41	$ 95,885	N/A	N/A	122.81	35.81	$ 2,706	2% Reduction	0
2806233	Single-Family Residential	$ 135,170	2.22	$ 60,971	N/A	N/A	93.07	48.04	$ 2,703	2% Reduction	0
2802697	Single-Family Residential	$ 65,850	0.14	$ 480,498	N/A	N/A	77.17	56.92	$ 1,317	2% Reduction	0
2802477	Single-Family Residential	$ 94,210	0.68	$ 139,404	N/A	N/A	67.48	18.16	$ 1,884	2% Reduction	0
Total		**$ 3,460,180**	**86.04**						**$ 40,101**		

Appendix Table C-3. City-Identified Residential Development Sites on Proposed Easement (Green)[35]

PPN	Land Use	Value	Acreage	Zoning	Lots Per Acre	Cut Off Acreage	Cut Off %	# of Lots Reduced	Value Reduction	Method Used	Continuum
2806848	Agricultural, Vacant	$ 79,640	13.06	Rural Residential	2	2.73	20.9%	5	$ 881,790	Subdivided lots (Cut Off)	6
2808809	Agricultural, Vacant	$ 54,190	8.71	Rural Residential	2	2.00	23.0%	3	$ 646,000	Subdivided lots (Cut Off)	6
2804284	Farm	$ 598,590	56.76	Single Family	3	3.00	5.3%	8	$ 1,491,750	Subdivided lots (Split)	4
2812141	Farm	$ 589,550	39.47	Single Family	3	2.64	6.7%	7	$ 1,312,740	Subdivided lots (Split)	4
2809192	Farm	$ 667,370	101.27	Single Family	3	7.20	7.1%	18	$ 3,580,200	Subdivided lots (Cut Off)	4
2810569	Farm	$ 248,510	40.35	Rural Residential	2	6.92	17.2%	12	$ 2,235,160	Subdivided lots (Cut Off)	6
2813381	Residential, Vacant	$ 115,350	41.53	Single Family	3	3.15	7.6%	8	$ 1,566,338	Subdivided lots (Split)	4
Total		**$ 2,353,200**	**301.16**			**27.64**	**9.2%**	**61**	**$ 11,713,978**		

[35] For city-identified residential development sites or vacant residential properties on the proposed pipeline easement, the following calculation was made to obtain a parcel's reduction in property value: Lots per Acre multiplied by Cut Off Acreage and 85% (to account for public right of way), further multiplied by either the value of new single family residential properties in the area ($195,000) or rural residential ($190,000) (values of properties with houses – not raw land). While the Study Team recognized that the Green land development code currently allows one lot per acre in rural residential, it was assumed that for efficiency purposes, land to be developed more than ten years into the future would be rezoned to allow an average of two units per acre.

Appendix Table C-4. Vacant Residential Properties on Proposed Easement (Green)

PPN	Land Use	Value	Acreage	Zoning	Lots Per Acre	Cut Off Acreage	Cut Off %	# of Lots Reduced	Value Reduction	Method Used	Continuum
2802336	Residential, Vacant	$ 47,930	3.02	Single Family	3	0.38	12.6%	1	$ 188,955	Subdivided lots (Cut Off)	5
2802335	Single-Family Residential	$ 43,740	2.41	Single Family	3	1.76	72.9%	4	$ 875,160	Subdivided lots (Cut Off)	5
Total		**$ 91,670**	**5.44**			**2.14**	**39.4%**	**5**	**$ 1,064,115**		

Appendix Table C-5. Vacant Residential Allotment Land on Proposed Easement (Green)

PPN	Land Use	Value	Acreage	Value Per Acre	House Site Acreage	House Site Value	House Dist from Pipe	Lot Line Dist from Pipe	Value Reduction	Method Used	Continuum
2815596	Residential, Vacant	$ 30,500	1.16	$ 26,214	N/A	N/A	N/A	N/A	$ 7,264	Land Residual	2
2807261	Residential, Vacant	$ 5,280	1.05	$ 5,027	N/A	N/A	N/A	N/A	$ 4,567	Land Residual	2
2801446	Residential, Vacant	$ 2,640	0.48	$ 5,490	N/A	N/A	N/A	N/A	$ 2,640*	Land Residual	2
2805453	Residential, Vacant	$ 1,530	2.86	$ 535	N/A	N/A	N/A	N/A	$ 1,530*	Land Residual	2
Total		**$ 39,950**	**5.56**						**$ 16,001**		

*Applying the land residual approach to these parcels revealed value reductions greater than the current property values. Because of this, their value reduction was set equal to their current property value.

Appendix Table C-6. Other Residential Properties on Proposed Easement (Green)

PPN	Land Use	Value	Acreage	Value Per Acre	House Site Acreage	House Site Value	House Dist from Pipe	Lot Line Dist from Pipe	Value Reduction	Method Used	Continuum
2815851*	Other Residential	$ 141,600	19.73	$ 7,178	N/A	N/A	N/A	N/A	$ 141,600	Full Reduction	5
2802957	Apartments (20-39)	$ 714,690	3.13	$ 228,127	N/A	N/A	N/A	N/A	$ 35,735	5% Reduction	0
Total		**$ 856,290**	**22.86**						**$ 177,335**		

***** The current owner of this property also owns a parcel to the north, which could allow for maintained road access even if the pipeline were to be constructed. However, because parcels were examined individually and ownership may change in the future, this property was assumed to have a full reduction in property value.

Appendix Table C-7. Other Residential Properties within 150 feet of Pipeline Easement Centerline (Green)

PPN	Land Use	Value	Acreage	Value Per Acre	House Site Acreage	House Site Value	House Dist from Pipe	Lot Line Dist from Pipe	Value Reduction	Method Used	Continuum
2803001	Two-Family Residential	$ 145,480	1.84	$ 79,119	N/A	N/A	N/A	N/A	$ -	None	0
2807188	Other Residential	$ 12,000	0.52	$ 23,227	N/A	N/A	N/A	N/A	$ 240	2% Reduction	0
2805983	Charitable Senior Homes	$ 12,940	1.25	$ 10,377	N/A	N/A	N/A	N/A	$ 259	2% Reduction	0
2805982	Charitable Senior Homes	$ 137,330	1.91	$ 71,805	N/A	N/A	N/A	N/A	$ 2,747	2% Reduction	0
Total		**$ 307,750**	**5.51**						**$ 3,245**		

Appendix Table C-8. Properties with No Value Reduction (City of Green)

PPN	Land Use	Value	Acreage
2802954	Agricultural, Vacant	$ 41,090	8.04
2804257	Agricultural, Vacant	$ 39,400	8.01
2806649	Agricultural, Vacant	$ 31,120	2.88
2807498	Agricultural, Vacant	$ 390,960	72.11
2802419	Agricultural, Vacant	$ 74,470	9.90
2803874	Agricultural, Vacant	$ 123,320	19.46
2810157	Farm*	$ 120,240	1.76
2801445	Farm*	$ 205,470	11.17
2812424	Farm*	$ 382,740	24.84
2813357	Farm*	$ 472,960	78.22
2813669	Farm*	$ 210,550	6.40
2816000	Farm*	$ 119,830	1.26
2801222	Forest Land	$ 3,700,440	104.94
2815969	Municipal Owned	$ 6,260	0.66
2800178	Municipal Owned	$ 603,840	80.70
2805993	Other Agriculture	$ 92,990	13.71
2813047	Park District Owned	$ 551,610	27.03
2803946	Place of Worship	$ 723,310	72.11
2800646	Residential, Vacant	$ 77,000	10.23
2802696	Residential, Vacant	$ 1,820	0.15
2808246	Residential, Vacant	$ 11,970	1.00
2808247	Residential, Vacant	$ 1,340	0.07
2809079	Residential, Vacant	$ 26,480	2.83
2809771	Residential, Vacant	$ 170	0.31
2813318	Residential, Vacant	$ 52,250	5.52
2815565	Residential, Vacant	$ 2,370	1.17
2815595	Residential, Vacant	$ 30,500	1.16
2815621	Residential, Vacant	$ 680	0.00
2803021	Residential, Vacant	$ 38,500	2.95
2813231	Residential, Vacant	$ 43,400	3.77
2815550	Residential, Vacant	$ 48,500	9.75
2812216	Residential, Vacant	$ 41,390	5.20
2816004	Single-Family Residential	$ 816,350	2.33
2808349	State Owned	$ 7,868,780	1190.24
2815819	State Owned	$ 11,800	1103.35
2815651	Timber*	$ 71,770	14.93
2815652	Timber*	$ 50,990	10.61
2815653	Timber*	$ 42,030	8.74

*These farm properties have houses on them and may be within 500 feet of the proposed pipeline. They may be eligible for losses, but to be conservative the Study Team has not included them. The timber properties may also have value losses similar to those zoned residential, but to be conservative we have not included them.

APPENDIX D. PRESENT VALUE CALCULATION INPUTS

Appendix Table D-1. Residential Present Value Calculation Inputs (Green)

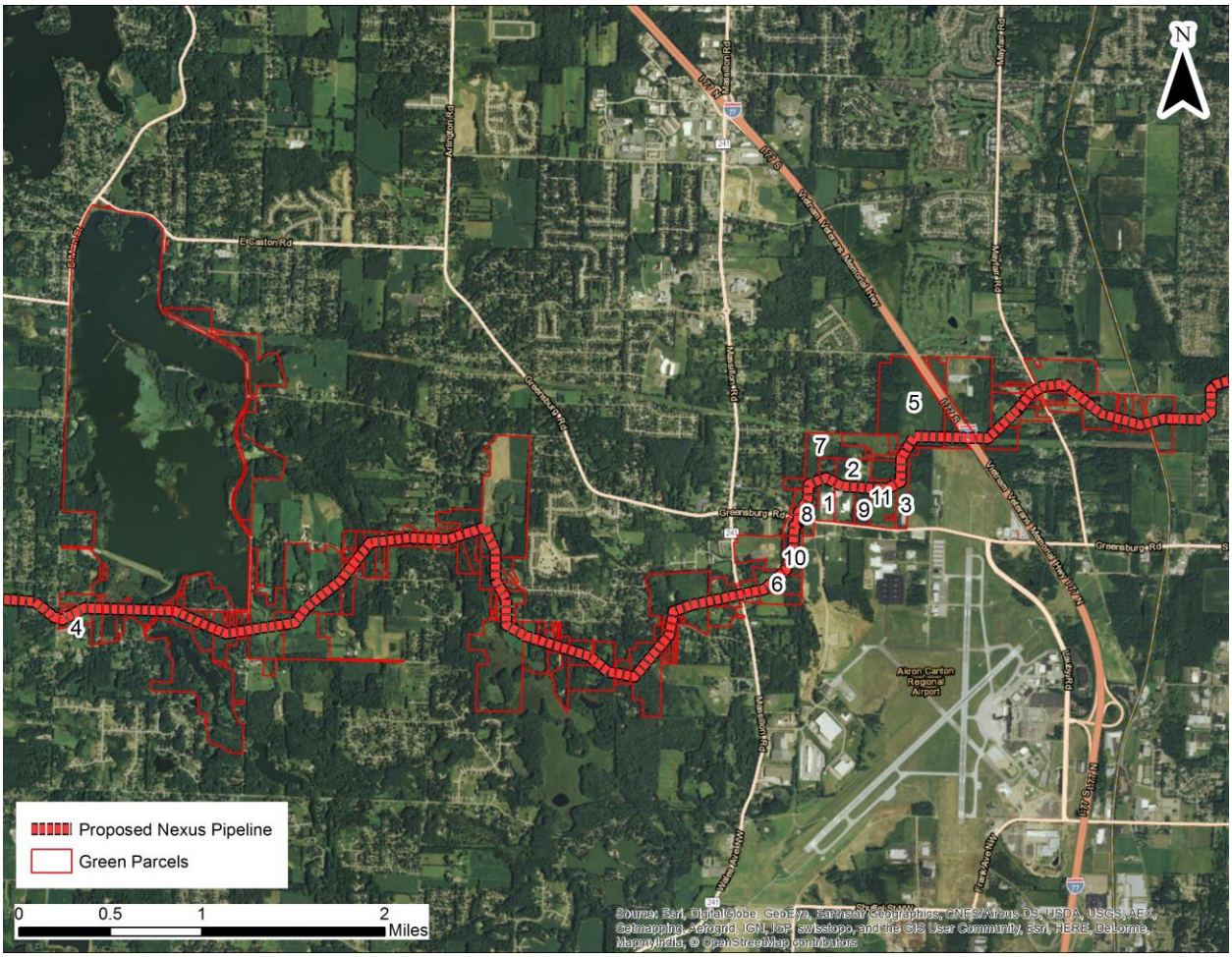
	Inputs
Inflation Factor	0.042065
House Price	$ 195,000
Present Value Factor	0.025
Property Tax Collection Rate (Total)	0.0198516
Summit County	0.0039814
Green LSD	0.0132858
Green City	0.0007561
Portage Lakes JVSD	0.0007069
Akron Summit Library	0.0006615
Summit Metro Parks	0.0004599
Existing Houses	61
Existing Houses Reduction Value	$ 4,781
Cumulative Existing Lots	4
Existing Lots Reduction Value	$ 4,000
Vacant Residential to be Subdivided	46
Residential Value	$ 195,000
Vacant Rural Residential to be Subdivided	20
Rural Residential Value	$ 190,000
Other Residential	6
Other Residential Reduction Value	$ 30,097
Green Median Income	$ 61,665
Future Households	66
Construction Labor Share of Building Value	42%
Construction Job Income Tax Rate	0.02
REVENUES FR0M PIPELINE	
Pipeline Basis Property Tax Revenues/Mile	$ 91,719,000
Miles in Green	7.74
Depreciation Value Factor	$ 13,757,850

Appendix Table D-2. Commercial and Industrial Present Value Calculation Inputs (Green)

	Inputs
Inflation Factor	0.042065
Present Value Factor	0.025
Property Tax Collection Rate (Total)	0.0217715
Summit County	0.0043565
Green LSD	0.0145764
Green City	0.0008400
Portage Lakes JVSD	0.0007775
Akron Summit Library	0.0007213
Summit Metro Parks	0.0004998
Industrial Properties	9
Commercial Properties	2
Industrial Land Value Reduction	$ 43,008
Commercial Land Value Reduction	$ 36,968
Industrial Building Value Reduction	$ 4,261,835
Commercial Building Value Reduction	$ 3,953,070
Employment Lost (per acre)	10
Wages Lost	$ 43,813
Construction Labor Share of Building Value	42%
Construction Job Income Tax Rate	0.02

APPENDIX E. CITY OF GREEN COMMERCIAL AND INDUSTRIAL PROPERTY CHARACTERISTICS

Appendix Figure E-1. Green Commercial and Industrial Property Overview Map



Appendix Figure E-2. Commercial/Industrial Property 1

Appendix Figure E-3. North Canton Transfer Entrance (Property 1)

Photo: Robert Simons

Appendix Figure E-4. North Canton Transfer Rear (Property 1)

Photo: Robert Simons

Appendix Figure E-5. Commercial/Industrial Property 2

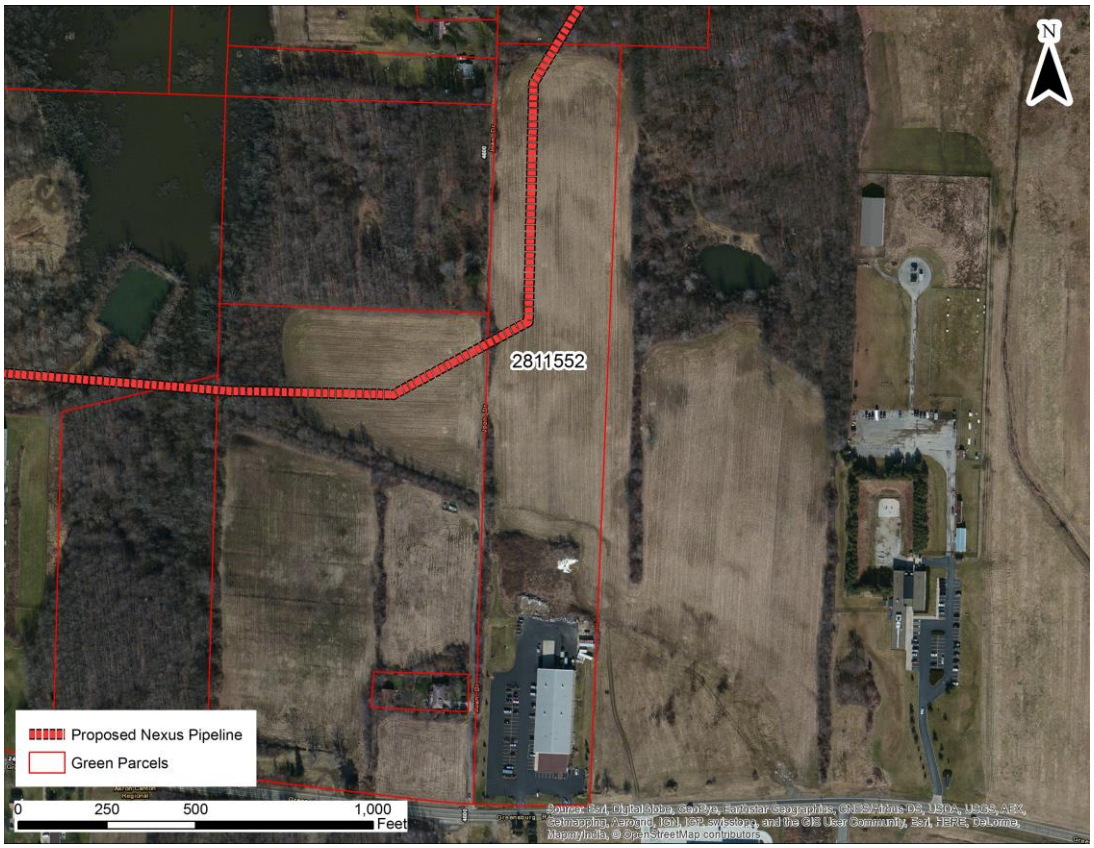
Appendix Figure E-6. Canton Elevator Front (Property 2)

Photo: Robert Simons

Appendix Figure E-7. Canton Elevator West Side (Property 2)

Photo: Robert Simons

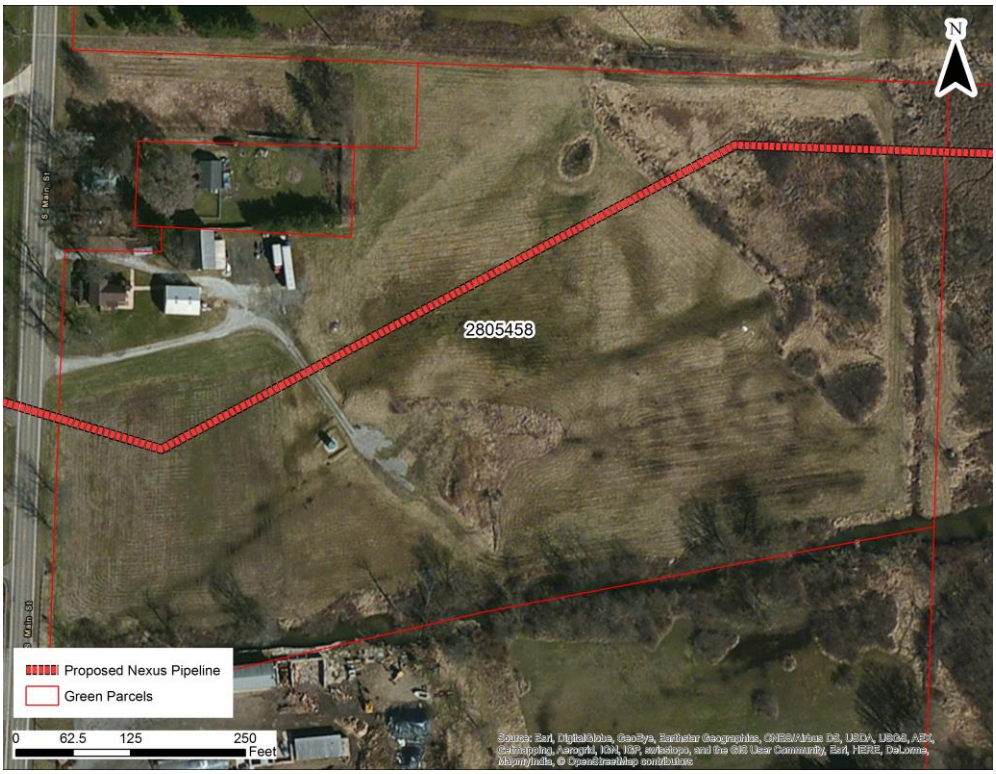
Appendix Figure E-8. Commercial/Industrial Property 3



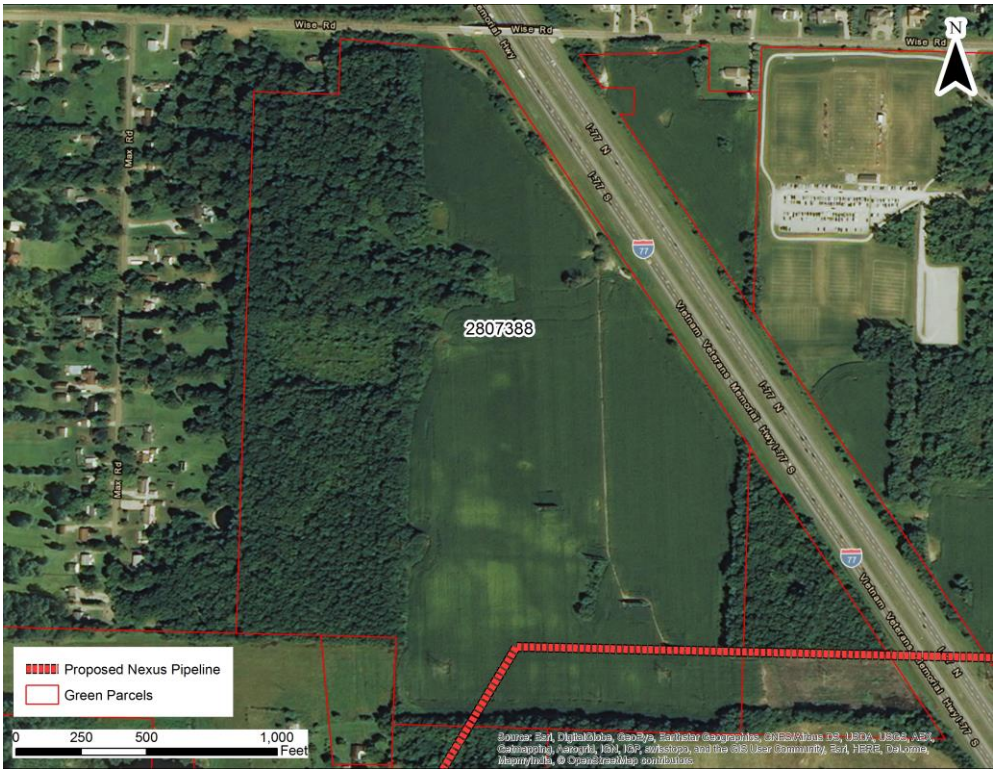
Appendix Figure E-9. Allen Keith Construction (Property 3)

Photo: Robert Simons

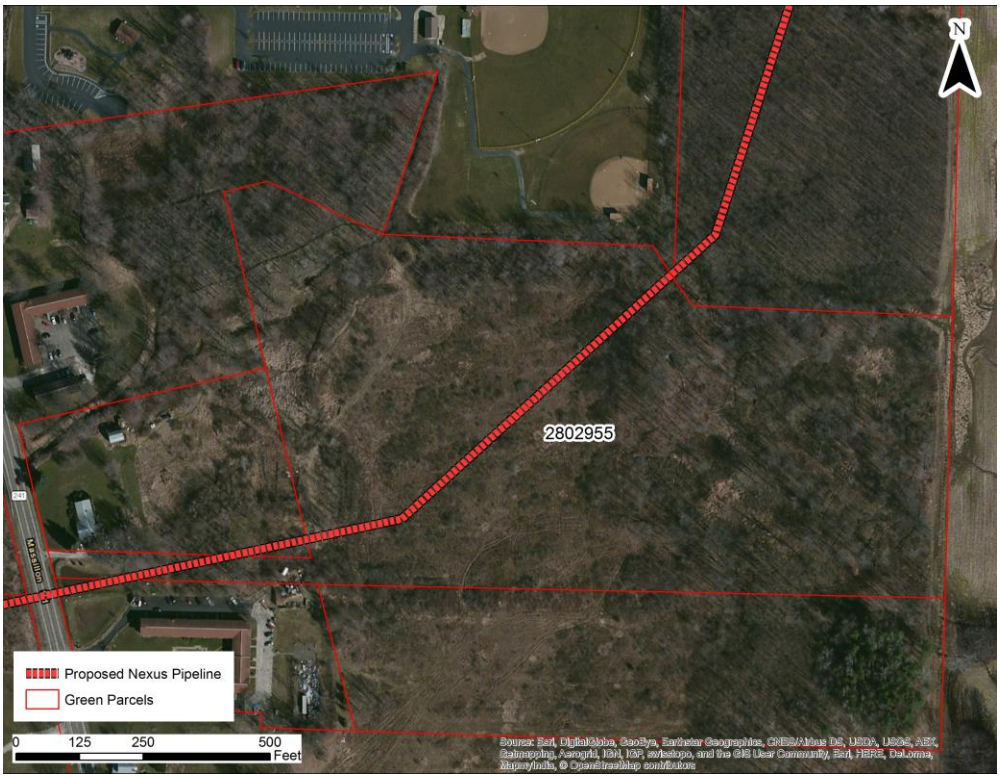
Appendix Figure E-10. Commercial/Industrial Property 4



Appendix Figure E-11. Commercial/Industrial Property 5



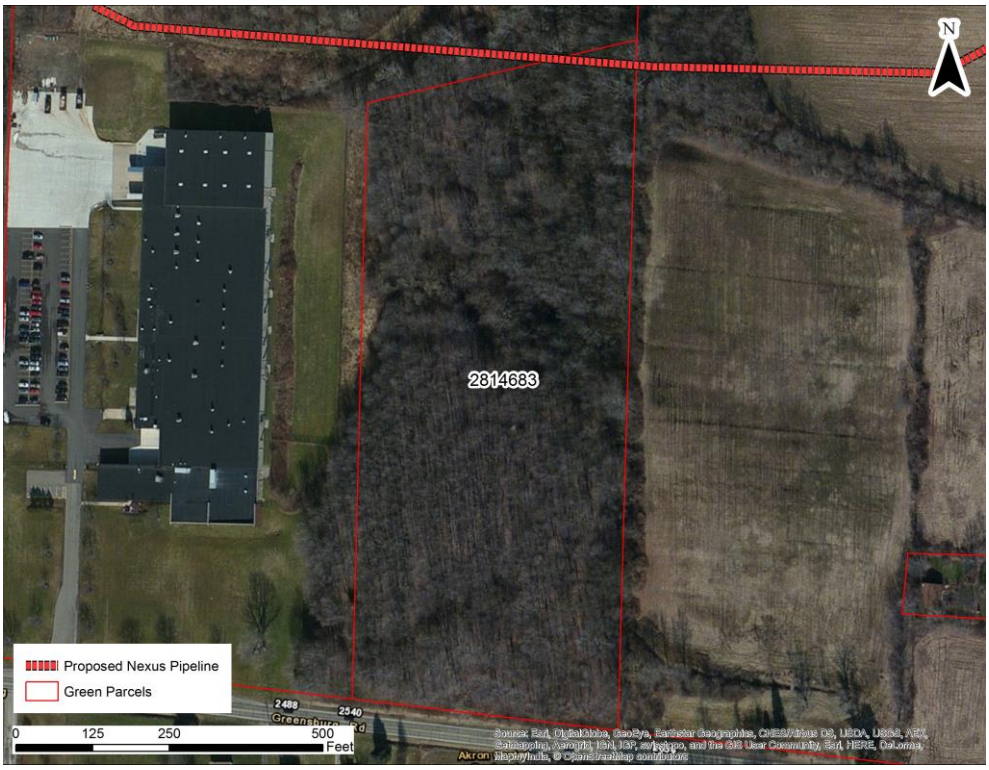
Appendix Figure E-12. Commercial/Industrial Property 6



Appendix Figure E-13. Commercial/Industrial Property 7

Appendix Figure E-14. Commercial/Industrial Property 8

Appendix Figure E-15. Commercial/Industrial Property 9



Appendix Figure E-16. Commercial/Industrial Property 10

Appendix Figure E-17. Commercial/Industrial Property 11