3.2 Air Quality

This section describes the air quality assessment prepared by ENVIRON International Corporation. The primary purpose of this analysis was to assess whether the proposed project would be likely to result in significant adverse air quality impacts. None were identified.

AFFECTED ENVIRONMENT

Air quality is typically assessed by comparing the known or anticipated concentrations of pollutants in the atmosphere with pollutant-specific standards designed to protect human health and welfare. In addition to several gases and size-fractionate particulate matter (called criteria pollutants) that have been recognized and controlled for many years based on their potential to affect human health and/or ecological systems, some gases (collectively called greenhouse gases or GHGs) have only recently been recognized and defined as air pollutants based on their potential to adversely affect the Earth's climate systems. Various criteria air pollutants as well as project-related GHGs are considered here.

Criteria Pollutants

Air quality is generally assessed in terms of whether concentrations of air pollutants are higher or lower than ambient air quality standards established to protect human health and welfare with a margin of safety. Two agencies have jurisdiction over ambient air quality within the project area: the U.S. Environmental Protection Agency (EPA), and the Washington Department of Ecology (Ecology). These agencies have established regulations that govern both the concentrations of pollutants in the outdoor air, and contaminant emissions from air pollution sources.

To measure existing air quality, Ecology maintains a network of monitoring stations throughout the State. Generally, these stations are placed where there may be air quality problems, so monitoring usually occurs in or near urban areas, or close to specific large air pollution sources. Other stations in more remote areas provide an indication of regional air quality. Based on monitoring information collected over a period of years, Ecology and EPA designate regions as being "attainment" or "nonattainment" for particular air pollutants. Attainment status is therefore a measure of whether air quality in an area complies with the National Ambient Air Quality Standards (NAAQSs), which are intended to protect human health with a margin of safety. Kittitas County is classified as an attainment area for all Federal and State air quality standards, including carbon monoxide (CO) and coarse and fine particulate matter (PM_{10} and $PM_{2.5}$, respectively). [1]

The review of pollutant emissions related to the proposed City Heights project employed a screening-level assessment of the potential CO concentrations near signalized intersections that could be affected by the proposed project. The methods and tools employed in this review are discussed in the Potential Developed-Condition Impacts subsection, below.

Greenhouse Gases

The phenomenon of natural and human-caused effects on the atmosphere due to global warming and other changes is generally referred to as "climate change." Due to the importance of the "greenhouse

[1] There are no ambient air monitoring stations within the City of Cle Elum or Kittitas County except for particulate matter monitors. The closest particulate monitor is located in Ellensburg, about 22 miles southeast of the project site. No particulate matter measurements at this station (or any other within the central Washington basin) have exceeded the NAAQSs in recent years (Ecology 2009).

effect" and related atmospheric warming to climate change, the gases that affect such warming are called greenhouse gases or GHGs. The GHGs of primary importance are carbon dioxide (CO_2), methane, ozone, and nitrous oxide. Because CO_2 is the most abundant of these gases (but not the most damaging on a volume basis because other gases persist much longer in the atmosphere), GHGs are now often quantified in terms of "CO_2 equivalents," or CO_2e.

Few data exist concerning existing emissions of GHGs within the project area. But recent legal developments in Washington and elsewhere have initiated broader considerations of such emissions and their potential effects on the atmosphere and on global climate. Although Washington has adopted emission reduction goals for GHGs, there are not yet any specific requirements for reducing GHG emissions or for assessing their potential environmental impacts. Until such rules or guidelines have been developed, the generally accepted approach is to quantify GHG emissions using the tools and techniques that are currently available. Thus, the air quality review for this project considered the potential life-cycle emissions of certain GHGs that can affect the global climate.

The analysis reviewed the proposed City Heights development alternatives to estimate potential project-related GHG emissions. The assessment was performed using tools that are still being developed and refined. Consequently, the GHG tabulation discussed below provides a preliminary indication of expected project-related GHG emissions. The context for this analysis and the methods employed are discussed in the Potential Developed-Condition Impacts subsection below.

POTENTIAL IMPACTS DURING CONSTRUCTION

Potential impacts during construction of the proposed project would include dust and emissions from construction-related vehicles, and odors associated with paving and possibly other activities. Specifically quantifying the extent, duration, and nature of these sorts of impacts would, however, require an exhaustive analytical effort that is not warranted by the potential for such emissions to adversely impact off-site locations. Therefore what follows is a qualitative discussion of potential impacts during construction for each of the alternatives.

Alternative 1: Preferred. Development of the project would involve construction of residences and commercial buildings and creation of roads and other infrastructure improvements. Such activities could result in temporary, localized increases in particulate concentrations due to emissions from construction-related sources. For example, dust from short-term construction activities such as excavation, grading, sloping and filling would contribute to ambient concentrations of suspended particulate matter. Construction contractor(s) would be required to comply with Ecology regulations requiring that reasonable precautions be taken to minimize fugitive dust emissions (WAC 173-400-040). Taking such precautions would substantially reduce the likelihood that such emissions would adversely affect off-site locations.

Construction would require the use of heavy trucks, excavators, graders and a range of smaller equipment such as generators, pumps, and compressors. Emissions from existing traffic in the vicinity of the project area would outweigh any slight degradation of local air quality that could result from construction equipment emissions. Nonetheless, emissions from such sources, and especially from diesel-fueled engines, are coming under increasing scrutiny by agencies because of their suspected risk to human health. Specific dose/response effects are unknown, but long-term exposure to excessive amounts of diesel emissions could represent a health risk, especially to sensitive individuals like the chronically ill, the old, and the very young. Hence, although there is little or no danger of such emissions resulting in pollutant concentrations that would exceed an applicable ambient air quality standard, pollution control agencies are now urging that emissions from diesel equipment be minimized to the extent practicable in order to reduce potential health risks. By minimizing on-site diesel engine idling and locating

combustion-fueled equipment as far as possible from newly built on-site or nearby off-site residences, diesel emissions would be unlikely to substantially affect air quality in the project vicinity.

Although some phases of construction would cause odors, particularly during paving operations using tar and asphalt, any odors related to construction would be short-term and unlikely to significantly affect the nearest residents. Construction contractor(s) would be responsible for complying with Ecology regulations that require the use of recognized good practice and procedures to reduce odors to a reasonable minimum if such odors were to interfere with an owner's use and enjoyment of their property (WAC 173-400-040).

Construction activities would also generate land-clearing debris. Washington State prohibits some outdoor burning of land-clearing debris in favor of alternative disposal methods (e.g., chipping and composting) to reduce risk to public health related to combustion emissions (WAC 175-425). For example, burning residential yard debris and land-clearing materials is banned in all Urban Growth Areas within Washington State. These prohibitions apply to most of the project site. To be consistent with these requirements and to minimize the potential for emissions from such activities to adversely affect people nearby, the project proponent has agreed to prohibit burning land-clearing debris and residential outdoor burning within the entire project area, including the area within the Cle Elum city limits.

With implementation of the controls required for the various aspects of construction activities, and with use of best management practices to minimize exposure of nearby people to prolonged exposure to emissions from diesel equipment, construction-related emissions associated with the City Heights project would not be expected to significantly affect air quality.

Alternative 2: Reduced Residential Density. Construction activities related to Alternative 2 would be the same as those described for Alternative 1, although Alternative 2 is slightly smaller in scope. Because either alternative would require approximately the same sort and duration of construction activities, potential emissions and regulatory requirements would be the same as described above, and potential construction-related impacts under Alternative 2 would be similar to those impacts described for Alternative 1.

Alternative 3A: No Annexation – Development within the County under Single Ownership. Construction activities would be the same under Alternative 3A as would be expected with Alternative 2, since either alternative would construct the same number and types of dwelling units and neighborhood commercial development, and the same approximate length of internal roadways. There would be no regulatory difference from an air quality perspective for the project to be developed within the County rather than within the City of Cle Elum. Because Alternative 3A would require the same sort and duration of construction activities, potential emissions and State/Federal regulatory requirements would also be the same as with Alternative 1 or 2, and potential construction-related impacts under Alternative 3A would be similar to those impacts described above for Alternative 1 or 2.

Alternative 3B: No Annexation – Development within the County under Multiple Ownerships. Site development under Alternative 3B would be substantially smaller in scope than any of the other build alternatives: approximately 500 dwelling units compared to 985 or 875, and no commercial development. In addition, the development would be unlikely to occur as a coordinated effort between or among parcel owners. Although the amount of construction activity would be less and the timing of development would likely be more sporadic, the types of activities would still be similar though probably of shorter duration and scope. Therefore, the types of construction-related impacts would be similar to those previously described, but likely with less potential for impacts.

Alternative 4: No Action. With the No Action Alternative, no development would occur on the property at this time. Therefore, no construction activities would be employed, and no construction-related air quality impacts would occur. There would be no change in existing conditions of dust, odors, or other air quality parameters on the site.

POTENTIAL DEVELOPED-CONDITION IMPACTS

Residential Wood Burning Impacts

Residential wood burning for space heating or aesthetic effects produces a variety of air contaminants, including relatively large quantities of carbon monoxide and course and fine particulate matter (PM_{10} and $PM_{2.5}$, respectively). Under the City Heights Planned Mixed-Use development Alternatives 1, 2 or 3A, the covenants, conditions and restrictions (CC&Rs) of the development, plat restrictions, and/or building permit restrictions will be used to prohibit installation and use residential wood-burning appliances such as wood stoves or fireplaces. Instead, homes within the development equipped with fireplaces would use natural gas or propane appliances that would not result in significant pollutant emissions. This prohibition would prevent emissions of air pollution related to residential space heating with wood and avoid what might otherwise constitute a significant impact to air quality in the area under the alternatives within the proponent's direct control. Therefore, the developed condition of the project under Alternative 1, 2 or 3A would not be expected to result in more than minor emissions of any pollutants related to residential space heating or wood burning for aesthetic purposes.

With Alternative 3B, the project area would likely be developed by multiple parties. Separate development of each parcel would preclude the ability of the proponent to restrict residential wood-burning appliances or to prohibit outdoor residential burning. Therefore under this alternative, emissions related to wood-burning would be more likely to occur, and potentially significant air quality impacts could result at locations near clusters of homes using wood heat or aesthetic wood burning.

Off-Site Traffic-Related Impacts

Of the various air pollutant emissions from vehicles that are regulated, carbon monoxide (CO) is the pollutant emitted in the largest quantity. CO is therefore often used as an indicator of potential air quality issues related to traffic sources. The most frequently used approach for evaluating CO concentrations in the ambient air is to review (and possibly perform air quality modeling of) traffic conditions near project-affected intersections. Accordingly, traffic conditions with the conceptual land use alternatives for the proposed City Heights development were considered based on the traffic impact analysis conducted for this project. (See Draft EIS Section 3.16 for additional information.)

A review based on EPA guidance regarding potential air quality impacts from transportation sources indicated projected traffic conditions at full build-out and occupancy in 2022 for any of the development alternatives would be unlikely to result in any significant air quality impacts. In accordance with EPA guidance, the review focused on signalized intersections with levels of service (LOS) D or worse (EPA 1992). Unsignalized intersections and signalized intersections with LOS C or better do not warrant analysis because by EPA definition, the operation of such intersections would have little or no potential to adversely affect air quality nearby. Projected LOS and average vehicle delays at signalized intersection during peak traffic periods suggest traffic conditions related to the development alternatives would *not* rise to the level of requiring quantitative analysis of possible CO levels. That is, projected future LOS and corresponding delays at the signalized intersections that would be most affected by the proposed project alternatives are projected to operate at LOS of B or better. Under these conditions, by definition in EPA guidance for considering potential traffic-related air quality impacts, the air quality effects of project

traffic would be minor under any of the alternatives because if project-related delays at nearby intersections are minimal, resulting air quality conditions are unlikely to be substantially affected.

On-Site Operational Impacts

Site development under Alternative 1, 2 or 3A would provide retail and business space in designated parcels along Summit View Road. Any potential air quality impacts to off-site locations from expected on-site commercial activities would be limited by both applicable ambient air quality standards and air quality nuisance rules (e.g., odor). These regulations are intended to protect sensitive individuals from unhealthy pollutant concentrations in ambient (outdoor) air and from detrimental effects on the use and enjoyment of property. Any regulated sources (e.g., a dry cleaner) would be subject to rules limiting pollutant emissions to minimize potentially unhealthy air quality concentrations to the nearest neighboring land uses. Any odor sources (e.g., a restaurant) would be subject to nuisance rules prohibiting effects that annoy neighbors. The potential for impacts perceived as annoying (as opposed to unhealthy) could still exist from some sources and activities despite their meeting applicable air quality rules, although this is unlikely due to the location of the commercial parcels identified on the conceptual land use plans and distance to nearest off-site neighbors.

With Alternative 3B, the 17 parcels that comprise the site would be developed under separate ownership without coordination. Existing informal recreational activities on and around the parcels would be likely to continue in the absence of coordinated development, so these activities would be less likely to be displaced or would be displaced more slowly as more gradual development occurs. These activities would likely include snowmobiling during the winter months, and the use of similar recreational equipment (e.g., motorcycles or other all-terrain vehicles) the rest of the year. As the area grows, any increases in the use of internal combustion engine-driven equipment would increase emissions of air pollutants associated with fuel burning. Such emissions could be perceived as odors in the vicinity of homes, primary use trails, or roads. But these emissions would be unlikely to have significant impacts on localized air quality conditions because the use of recreational equipment on the site would be relatively few in number, over a fairly large and dispersed area, and for relatively short periods of time.

With the No Action Alternative, the potential for air quality impacts associated with informal recreational use of the site would be similar to that described above with Alternative 3B. There would be no construction-related emissions generated on-site with Alternative 4.

In general, with the exception of potential impacts related to open burning or residential wood burning that would be most likely to occur with Alternative 3B development under separate ownership, the developed-condition of the project under any of the conceptual land use alternatives would be unlikely to result in any significant air quality impacts.

Greenhouse Gas Emissions

Vehicles are a significant source of GHG emissions primarily through the burning of gasoline and diesel fuels. National estimates indicate the transportation sector (including on-road and construction vehicles, airplanes and boats) accounts for 30 percent or more of total domestic CO_2 emissions. Estimates for Washington State suggest that transportation accounts for nearly half of GHG emissions because our State relies heavily on hydropower for electricity, unlike other states that rely more heavily on fossil fuels (coal, petroleum, and natural gas) to generate power. The next largest contributors to total gross GHG emissions in Washington are about 20 percent each in fossil fuel combustion in the residential, commercial, and industrial sectors; and in electricity consumption. Solid waste contributes about 2 percent (Ecology 2008).

Compared to the "criteria" air pollutants like carbon monoxide and fine particulate matter, GHGs have only recently been recognized as an issue for consideration during the environmental review of proposed projects. CO_2 is not considered an air "pollutant" based on direct health-related impacts, so it is not subject to ambient standards used to gauge pollutant concentrations in the air. Instead, approaches to managing CO_2e emissions are based on controls aimed at first slowing down and then reducing overall atmospheric concentrations over time. On the local level, GHG management is typically aimed at transportation and land use planning and/or energy conservation associated with proposed new development or redevelopment.

In response to the issue of climate change on a global or regional scale, several states and many local jurisdictions are now taking steps to begin reducing GHG emissions. For example, the States of California, Massachusetts, and Washington have adopted GHG emission reduction goals similar to those included in the Kyoto Protocol, the widely-adopted international guideline intended to address this issue. In addition, numerous cities have adopted similar goals and have begun implementing programs to begin quantifying GHG emissions in order to eventually begin reducing them. The U.S. Environmental Protection Agency (EPA) has recently joined the effort to quantify and reduce CO_2 emissions, but this effort has only just begun. Although recent legislation in Washington State established GHG emission reduction targets in future years and set specific emission targets for some sources, there are as yet no specific emission reduction requirements or targets that apply to land use projects. Nor are there generally accepted emission level "impact" thresholds that provide effective means to assess potential localized impacts of GHG emissions.

The GHG emissions assessment for the City Heights project was performed using tools that are still being developed and refined. Procedures for calculating, analyzing, and interpreting the implications of greenhouse gas emission generation from site-specific land use proposals are still in their earliest stages. There is no uniform guidance at the State level (i.e., from the Washington Department of Ecology), nor from local jurisdictions other than King County, Washington. Consequently, the GHG tabulation reported below is a preliminary indication of expected project-related GHG emissions based on a modified version of the King County emission tabulation tool.[2] For purposes of this analysis, this tool was modified to reflect project-specific data where possible. In accordance with findings regarding the primary sources of GHG emissions, this tabulation focused on three areas/sources of emissions described below. A summary tabulation is presented in Table 3.2-1.

- Building materials and processes (Embodied emissions). This portion of the calculation considered both the "upstream" (i.e., mining, harvest, manufacturing, and transport) and the "downstream" (i.e., subsequent, "in place" use and maintenance) of building materials. The default values applied in the King County tool were modified to reflect averages based on materials expected to be used in the proposed development (instead of applying averages based on all possible materials combined).[3]

- Post-development energy usage (Energy). This element considered energy consumption in terms of British thermal units (btus) consumed by use of electricity and natural gas for providing space heating and power for household uses. The default values were modified to reflect estimates of Pacific Northwest energy usage (instead of national averages).[4]

[2] The tabulation of GHGs was based on a calculation procedure issued by King County in December 2007.

[3] Athena EcoCalculator for assemblies, version 2.3 – Northern USA low-rise building evaluation tool was used instead of the default values in the King County spreadsheet tool.

[4] Residential building energy consumption was updated based on most current energy use data for the Pacific Northwest region (Energy Information Association 2006).

- Transportation (Transport). This component considered GHG emissions related to vehicle use by people living in the fully built-out development. Here again, one critical default value was modified to reflect updated annual vehicle miles traveled (VMT) and current miles per gallon vehicle ratings.[5]

The estimated CO_2 equivalent emissions shown in Table 3.2-1 represent the life cycle GHG emissions of the City Heights conceptual land use alternatives; that is, the cumulative emissions over the useful life of the homes and commercial buildings expected to be built in the project. The useful life of single-family detached homes was assumed to be about 58 years, the life of attached dwelling units about 80 years, and the useful life of retail buildings about 63 years (King County 2007).

Table 3.2-1. Estimated project-related life cycle greenhouse gas emissions (ENVIRON International Corporation 2009).

Type of Use	# Units	Square Ft (thousands)	Emissions per Unit or per Thousand Square Feet ($MTCO_2e$)			Life cycle Emissions ($MTCO_2e$)
			Embodied	Energy	Transport	
Alternative 1 Development (Preferred)						
Detached Homes	690	--	55	1,082	637	1,186,954
Attached Homes	295	--	30	1,096	616	514,078
Retail (other than mall)	--	20.0	22	496	199	14,320
Pavement primary roads	--	919.1	--	--	--	45,955
					Total Alternative 1	**1,761,307**
Alternative 2 or 3A						
Detached Homes	488	--	55	1,082	637	839,469
Attached Homes	383	--	30	1,096	616	667,430
Retail (other than mall)	--	40.0	22	496	199	28,640
Pavement primary roads	--	775.4	--	--	--	38,770
					Total Alternative 2 or 3A	**1,574,309**
Alternative 3B						
Detached Homes	500	--	55	1,082	637	884,468
Attached Homes	0	--	30	1,096	616	0
Retail (other than mall)	--	0.0	22	496	199	0
Pavement primary roads	--	775.4	--	--	--	38,770
					Total Alternative 3B	**923,238**
$MTCO_2e$ means metric tons of CO_2 equivalent gases. A metric ton ≈ 1.1 short (i.e., standard US) tons (at 2,000 lbs)						

[5] Revised annual vehicle miles traveled in the King County spreadsheet tool using updated WSDOT data and current EPA vehicle emissions data.

Alternative 1: Preferred. The largest quantity of greenhouse gas emissions would be generated under Alternative 1. This alternative would include the largest number of residential units and the paving of the most primary roads compared to the other build alternatives.

Alternative 2: Reduced Residential Density. Compared to Alternative 1, Alternative 2 would emit less greenhouse gases over the life span of the project due primarily to development of fewer single-family detached homes (because these dwelling units require more resources to construct and use more energy to operate than do attached dwelling units).

Alternative 3A: No Annexation – Development within the County under Single Ownership. Greenhouse gas emissions with Alternative 3A would be the same as those calculated for Alternative 2 due to the same type and number of dwelling units and commercial space. Total greenhouse gas emissions under Alternative 3A would be less than with Alternative 1.

Alternative 3B: No Annexation – Development within the County under Multiple Ownerships. Single-family residences are likely to be the only type of building constructed under Alternative 3B. Compared to the other alternatives, this development also would be less dense. These factors combine to make this the lowest greenhouse gas emissions options of the action alternatives being considered.

Alternative 4: No Action. With the No Action Alternative, the site would not be developed at this time, and no additional greenhouse gas emissions would be expected. If the project site were to remain undeveloped, vegetation on the property would continue to serve a beneficial effect from a greenhouse gas perspective – emitting no GHGs, and absorbing GHGs generated by other sources in the surrounding environment.

There are as yet no particular means to gauge whether the GHG emissions that would result from any of the conceptual land use alternatives would constitute an "impact" in terms of their potential effects on climate. Current guidance in this area simply indicates the need to estimate CO_2e emissions with the intent to compile data for use in later discussions of this issue. And although it would be useful to put these emissions into perspective based on comparisons with similar sorts of projects, no truly comparative data yet exist.

MITIGATION MEASURES

Mitigation Measures Included in the Development Proposal. The project proponent (Northland Resources) has committed to prohibit residential wood-burning devices for space heating or aesthetics, and outdoor burning through Covenants, Conditions & Restrictions (CC&Rs) to be enforced by the Homeowners Association. The City will further enforce these restrictions through plat conditions and/or building permit conditions. These commitments will preclude the discharge of potentially significant sources of fine particulates and other pollutants to the air with Alternative 1, 2 or 3A. It is not known at the time of this writing whether there will be any additional features incorporated into the proposed development to minimize potential greenhouse gas emissions. The analysis identifies no need to mitigate traffic-related emissions for purposes of maintaining good air quality, based on acceptable Level of Service operating conditions at signalized intersections within the study area.

Applicable Regulations. Construction activities would be required to comply with Ecology's fugitive dust and odor emissions regulations cited in WAC 173-400-040 and outdoor burning prohibitions in WAC 175-425. There are no other applicable regulations that require specific mitigation measures.

Other Recommended Mitigation Measures

Construction-Related Emissions

Although significant air quality impacts related to construction are not anticipated, the potential for temporary, local degradation of air quality from construction activities could be minimized by development and implementation of a plan for minimizing dust and other emissions by applying best management practices. The Associated General Contractors of Washington's *Guide to Handling Fugitive Dust from Construction Projects* provides practical examples of suggested best management practices necessary to comply with air quality regulations involved in the construction process. The following is a list of possible mitigation measures specified in the guide that could be implemented to reduce potential temporary air quality impacts during construction of the project.

- Use only equipment and trucks that are maintained in optimal operational condition.
- Require all off-road equipment to be retrofitted with emission reduction equipment (that is, require participation in program similar to the Puget Sound region Diesel Solutions Program by project sponsors and contractors).
- Use biodiesel or other lower emission fuels for vehicles and equipment.
- Encourage trip-reduction strategies for construction workers (to the extent practical).
- Stage construction to minimize overall transportation system congestion and delays to reduce regional emissions of pollutants during construction.
- Implement restrictions on construction truck idling (for example, limit idling to a maximum of 5 minutes).
- Locate construction staging zones where diesel emissions will not be noticeable to the public or be near sensitive populations such as the elderly and the young.
- Spray exposed soil with water or other suppressant to reduce emissions of PM10 and deposition of particulate matter.
- Pave or use gravel on staging areas and roads that would be exposed for long periods.
- Cover all trucks transporting materials, wet materials in trucks, or provide adequate freeboard (space from the top of the material to the top of the truck bed), to reduce PM10 emissions and deposition during transport.
- Provide wheel washers to remove particulate matter that would otherwise be carried off-site by vehicles to decrease deposition of particulate matter on area roadways.
- Remove particulate matter deposited on paved, public roads, sidewalks and bicycle and pedestrian paths to reduce mud and dust; sweep and wash streets frequently to reduce emissions.
- Cover dirt, gravel and debris piles as needed to reduce dust and wind-blown debris.
- Route and schedule construction trucks to reduce delays to traffic during peak travel times to reduce air quality impacts caused by a reduction in traffic speeds.

Greenhouse Gas Emissions

No GHG-reducing mitigation measures have been included in the proposed project. Although there are no specific requirements to do so, some factors could be included into the proposed development to reduce CO_2e emissions over the life of the project. Options include applying Built Green or LEED®-certified/Energy Star standards to the development, and/or the incorporation of Low Impact Development

(LID) methods to reduce potential impacts on water resources and promote water conservation. Such LID measures would also potentially reduce GHG emissions due to water use and the level of necessary storm water control.

Other measures that would reduce GHG emissions on the local level include any steps that would alter those aspects of the project that contribute to emissions due to construction of the development, energy use by the people who live there, or the need to drive. While the global impacts of GHG emissions cannot be solved on the local level by the measures suggested here, reducing GHGs on the local level does contribute to the reduction goal of the Washington State Legislature to reduce GHG emissions in our State. Each of these measures is addressed further below.

Construction materials that reduce GHG emissions use renewable resources, composites, and/or materials made from recyclables (e.g., farmed wood and wood/plastic composites – from recycled plastic and wood), and de-emphasize use of non-renewal resources (e.g., old-growth or exotic lumber, virgin metals, or more than essential quantities of concrete). Because renewable and recycled materials use less resources and require a fraction of the energy necessary to produce virgin materials, associated GHG emissions are substantially lower.

End-use energy consumption in residences is a primary contributor to overall GHG emissions. Such energy use is a function of multiple factors, many of which could be positively affected during development of the project. For example, site layout/design that maximizes exposure to the sun in the winter and takes advantage of natural ventilation can reduce winter heating needs and the need for summertime forced-air ventilation. Using construction techniques and materials that exceed building code requirements can reduce long-term energy use. Employing innovative heating technologies such as heat pumps, hot-water radiant floors, and ultra-high efficiency furnaces also would reduce energy consumption compared with standard space-heating systems. Similarly, technologies to provide or supplement water-heating (e.g., on-demand and/or solar-assisted heating instead of continuously heated, large tank reservoirs) also would reduce the overall energy footprint of the development. And any steps that reduce energy use would reduce any related GHG emissions. Implementing a high LEED®, Built Green, or other low-impact/high-efficiency building standard would help conserve resources and reduce GHG emissions compared with conventional development techniques.

SIGNIFICANT UNAVOIDABLE ADVERSE IMPACTS

No significant unavoidable adverse air quality impacts have been identified related to the City Heights land use alternatives, and none would be anticipated.