

# International Dark Sky Community

Designation Application



**Bon Accord**  
building for tomorrow

culture education environment

# Contents

Introduction.....	3
Demographics and Features.....	4
Lighting Zones Map.....	6
Light Pollution Maps.....	8
SOM (Sky Quality Meter) Readings.....	10
Statistics.....	12
Now and Future.....	13
Supporting the Strategic Plan Through Policy.....	14
Tourism and Recreation.....	15
Education.....	18
Letters of Support.....	30
Public and Media Relations.....	48
The Projects.....	54
Walking the Talk through Municipal Governance (Policy & Bylaw).....	62



The year 1892 started on a Friday, and was a leap year. It was the 55th year of Queen Victoria's reign and the year in which John Thompson became Canada's 4th Prime Minister. By 1896 a group of settlers in the area called a meeting for the purpose of organising a local school district in what was then the North West Territories. Of the eight settlers present at the meeting, it was a man originally from Aberdeen, Scotland who suggested the name of the new district be the motto of Aberdeen, "Bon Accord."

Bon Accord, like many of the rural towns across the Canadian prairies, was initially founded as a school district, combined with an agricultural need to provide goods and services that were unavailable outside of Edmonton, the capital of Alberta, and nearest metropolitan hub. By 1964 Bon Accord attracted enough residents to incorporate it as a Village and as a Town in 1979.

While the surrounding community is still largely dominated by farming activities, today the Town is home a large number of Canadian Forces personnel stationed at the nearby Canadian Forces Base Edmonton.

Bon Accord is close enough to the Alberta Capital to enjoy the amenities and services offered in Edmonton, but it is also far enough away from the city to enjoy spectacular night-time views of the stars and panoramic prairie skies. These were enhanced in 2012 when the Town Council adopted numerous new practices and technology to become a Light Efficient Community when Council adopted Meeting - Resolution 12.29 on February 7th 2012.

Settling the area was a difficult task for the first groups of people to come to the Bon Accord area, as "generally speaking our weather consists of long cold winters and short cool summers. Snow usually comes in November and stays until March. In an average winter, spells of severe cold are alleviated by frequent moderate spells. Bright sunshine and clear blue skies prevail."<sup>1</sup> If that chilling description doesn't make you cold just reading it, you'd be a good fit in the area. A table accompanying the preceding text includes the mean average temperature over ten years in Bon Accord calculates it to be 36.6° F, or 2.5°C.

As bad as this sounds, it is advantageous to stargazers lucky enough to experience these northern climates. As the days grow shorter in November and December the nights grow longer, removing that annoying blue haze that blocks our views of the stars. While the mercury in the thermometer drops, the sky clears, as cold air cannot hold as much moisture as warm air, preventing that hazy glare often seen in the summer.

By applying for this designation, the Town wants to permanently affirm its commitment to preserving the night sky for generations of children and stargazers to come. Leading thinkers who came before us grew up enamoured by the vastness of the universe, unimpeded by light pollution. The astrophysicist Neil deGrasse Tyson once described going to the Hayden Planetarium in New York City when he was nine years old.

Having no concept of the cosmos or night sky before visiting, the stars came out and he said "that's an entertaining hoax, there aren't that many stars in the night sky, I know, I've seen them from the Bronx, there are 11 stars in the night sky, but I'll just play along because it's fun to watch these people make this stuff up."

The experience fueled his drive to become an astrophysicist, and now Tyson is the Director of the Hayden Planetarium. Philosophers, scientists, and those with a curious mindset have always gazed into infinity when they look at the night sky, and ensuring that legacy endures is one of the reasons that achieving this designation is important to the Town of Bon Accord.

<sup>1</sup> Chubb and Milligan 1969), 8.

<sup>2</sup> Chubb and Milligan 1969), 19-21.

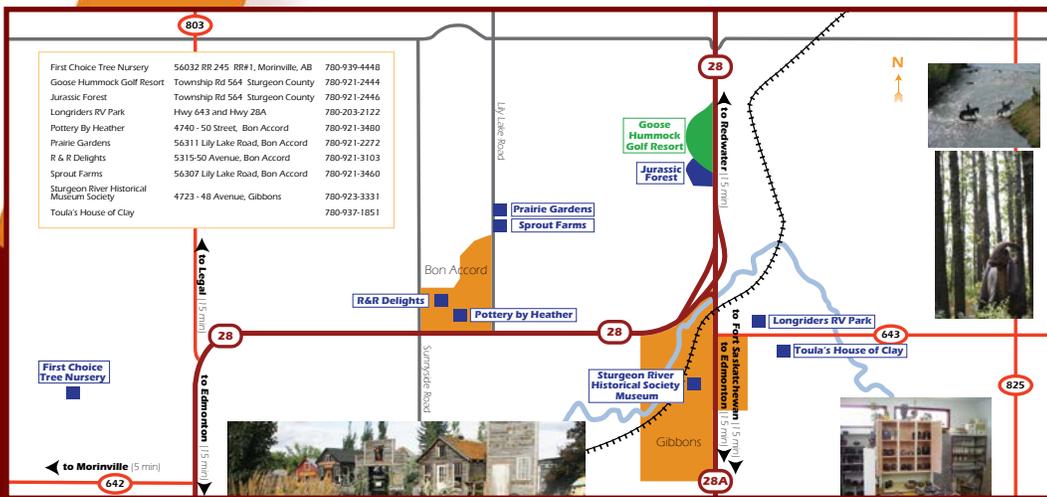
<sup>3</sup> British Broadcasting Corporation 29 July 2013)

# Demographics and Features

The most recent census data available in Canada is the 2011 census. As of that census, the Town of Bon Accord had 1,485 residents in 569 private households, over an area of 2.11 square kilometres (0.81 sq mi), at an elevation of 701m (2,051 ft) above sea level, with a population density of 706.2 people per square kilometre.

The median age of the population is 33.8 years old, a majority of them employed in the manual trades or related occupations. The population within a 10 km radius is 8500. There are two schools in Bon Accord, Bon Accord Community School (BACS) and Lillian Schick. Bon Accord Community School is a Kindergarten to Grade 4 school with 235 students, while Lillian Schick is a Junior High school teaching grades 5 through 9, with approximately 240 students. High school students, grades 10 through 12, attend Sturgeon Composite High School or Redwater High School located in a nearby community.

Bon Accord experiences roughly 2,300 hours of sunlight per year, among the sunniest locations in Canada. Precipitation levels average 476.9 mm (18.776") with the growing season ranging from the beginning of May to the end of September for an average of 140 frost free days per year. Located at latitude of 53° 50' 11.7" north and a longitude of 113° 24' 43.5" west and has over 110 hectares of developable land.



- 1 - Fire Hall
- 2 - Town Office
- 3 - Public Library
- 4 - ATB Financial Agency
- 5 - Lilypad Lane
- 6 - SUBlimE Aesthetics
- 7 - Bon Accord Clock Tower
- 8 - Sphinx Salon and Spa
- 9 - Hughes Electronics
- 10 - Bon Accord Post Office
- 11 - Chelsea's Pub
- 12 - Whitson Insurance Services Your Second Look
- 13 - Bon Accord Foods
- 14 - Bon Accord and Gibbons Food Bank
- 15 - Centennial Park (Train Park)
- 16 - Bon Accord Community Hall
- 17 - United Church
- 18 - Anglican Church
- 19 - Rose Glen
- 20 - Lillian Schick School
- 21 - The Crafty Sewing Bee
- 22 - Pottery by Heather
- 23 - Badgers
- 24 - Mac's/Husky
- 25 - Sturgeon Memorial
- 26 - Moonlight Hotel
- 27 - A & K Restorations
- 28 - The Liquor Cabinet
- 29 - Videos & More
- 30 - Bon Accord Community School
- 31 - Water Fill Station
- 32 - Bon Accord Public Works Shop
- 33 - Sports Field
- 34 - Bon Accord Arena
- 35 - Golden Gems Hall
- 36 - R & R Delights
- 37 - The Father's House Christian Fellowship
- 38 - Rose Garden
- 39 - Springbrook Park

Regional Tourism Attractions Map



# Lighting Zones Map

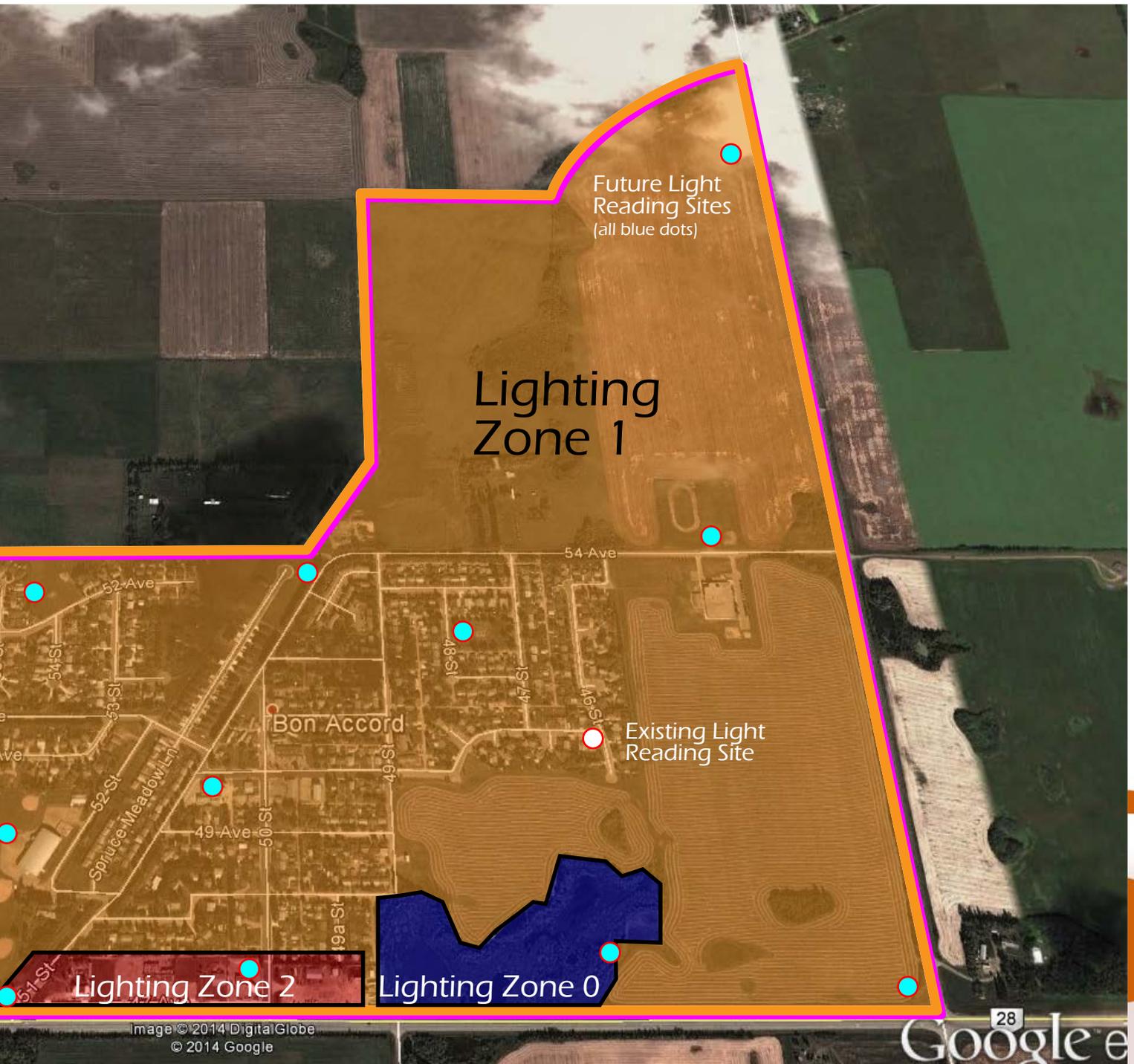
Below on page six and seven are the lighting zones for the Town of Bon Accord. North is up on each page. The City of Edmonton is to the south by highway driving for 20 minutes.

A light pollution map of the immediate area around Bon Accord, the Capital Region where Bon Accord is located on the north side of the region and then finally a map of Alberta to aid in understanding light domes affecting sky quality for Bon Accord and the Alberta Capital Region.



Lighting zone zero on the map is located over a currently protected marshland. There is no infrastructure or future development in this zone. The rest of the town is in a lighting zone one with the exception of the commercial highway frontage at the south end of Bon Accord. With the grandfather clause of Bon Accord's Light Efficient Community Bylaw ends in 2023 even the existing lighting in Zone Two will be improved by 2023.

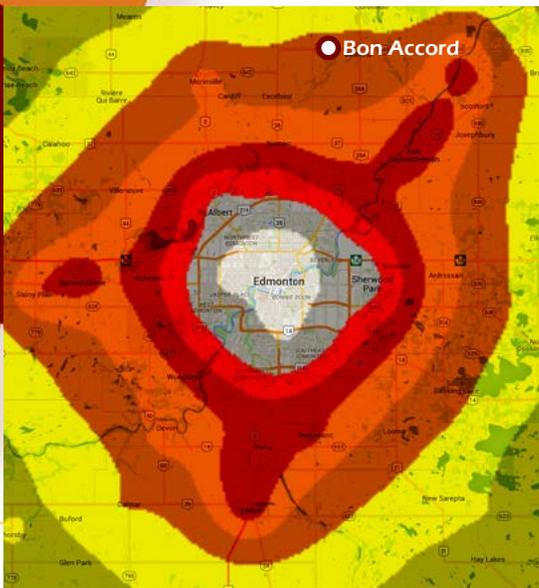
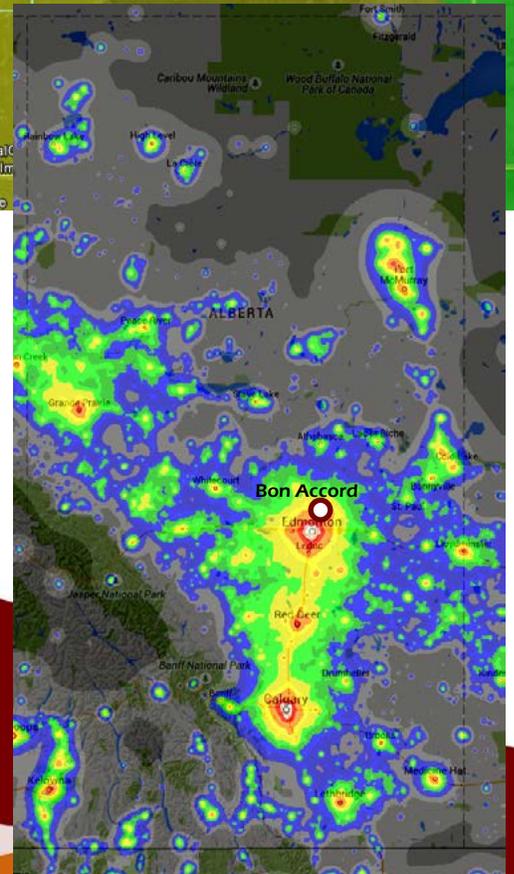
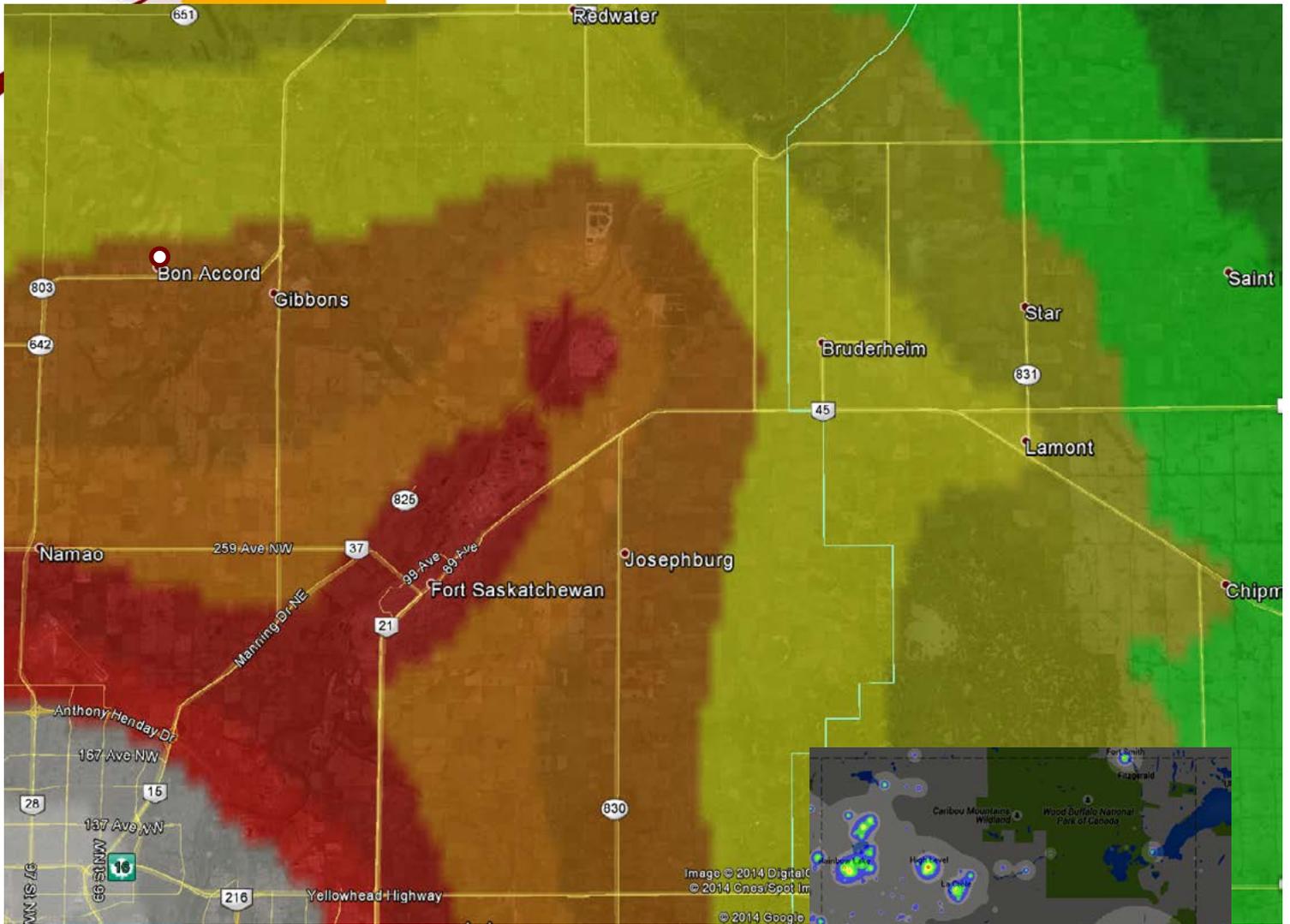
Blue and red dots on the map indicate future SOM (Sky Quality Reading) sites within the municipality. The SOM site for data collections for this application were taken from the site in the east side of the developed neighbourhoods within Bon Accord indicated on the map with a white and red dot. The SOM readings from this site are listed on page 11 of this application.



# Town of Bon Accord & Region

Current Light Pollution Map

(City of Edmonton is located partially in the bottom left corner of map)



Alberta Capital Region

Alberta

Conditions at Zenith				
Color	Artificial / Natural Sky Brightness	Sky Brightness mags / sq arcsec V Band	Bortle Scale <small>approx</small>	Description (Descriptions are approximate. Your sky may vary.)
	< 0.01	22.00 to 21.99	1	Theoretically darkest sky limited by <a href="#">airglow</a> and starlight
	0.01 to 0.06	21.99 to 21.93	2	<a href="#">Gegenschein</a> visible. <a href="#">Zodiacal light</a> annoyingly bright. Rising milkyway confuses some into thinking it's dawn. Limiting magnitude 7.6 to 8.0 for people with exceptional vision. Users of large dobsonian telescopes are very happy. [-ad]
	0.06 to 0.11	21.93 to 21.89	2	Faint shadows cast by milkyway visible on white objects. Clouds are black holes in the sky. No light domes. The milky way has faint extensions making it 50 degrees thick. Limiting magnitude 7.1 to 7.5. [-ad]
	0.11 to 0.19	21.89 to 21.81	3	
	0.19 to 0.33	21.81 to 21.69	3	The sky is crowded with stars, extending to the horizon in all directions. In the absence of haze the M.W. can be seen to the horizon. Clouds appear as black silhouettes against the sky. Stars look large and close. [- <a href="#">Richard Berry</a> ] Low light domes (10 to 15 degrees) on horizon. M33 easy with averted vision. M15 is naked eye. Milky way shows bulge into Ophiuchus. Limiting magnitude 6.6 to 7.0. [-ad]
	0.33 to 0.58	21.69 to 21.51	4	21.6: ... a glow in the direction of one or more cities is seen on the horizon. Clouds are bright near the city glow. [- <a href="#">Richard Berry</a> ]
	0.58 to 1.00	21.51 to 21.25	4	Zodiacal light seen on best nights. Milkyway shows much dark lane structure with beginnings of faint bulge into Ophiuchus. M33 difficult even when above 50 degrees. Limiting magnitude about 6.2 to 6.5. [-ad]
	1.00 to 1.73	21.25 to 20.91	4.5	21.1: The M.W. is brilliant overhead but cannot be seen near the horizon. Clouds have a greyish glow at the zenith and appear bright in the direction of one or more prominent city glows. [- <a href="#">Richard Berry</a> ] Some dark lanes in milkyway but no bulge into Ophiuchus. Washed out milkyway visible near horizon. Zodiacal light very rare. Light domes up to 45 degrees. Limiting magnitude about 5.9 to 6.2. [-ad]
	1.73 to 3.00	20.91 to 20.49	4.5	
	3.00 to 5.20	20.49 to 20.02	5	20.4: To a city dweller the M.W. is magnificent, but contrast is markedly reduced, and delicate detail is lost. Limiting magnitude is noticeably reduced. Clouds are bright against the zenith sky. Stars no longer appear large and near. [- <a href="#">Richard Berry</a> ] Milkyway washed out at zenith and invisible at horizon. Many light domes. Clouds are brighter than sky. M31 easily visible. Limiting magnitude about 5.6 to 5.9. [-ad]
	5.20 to 9.00	20.02 to 19.50	5	
	9.00 to 15.59	19.50 to 18.95	6	19.5: M.W. is marginally visible, and only near the zenith. Sky is bright and discoloured near the horizon in the direction of cities. The sky looks dull grey. [- <a href="#">Richard Berry</a> ] Milkyway at best very faint at zenith. M31 difficult and indistinct. Sky is grey up to 35 degrees. Limiting magnitude 5.0 to 5.5. [-ad]
	15.59 to 27.00	18.95 to 18.38	7	
	27.0 to 46.77	18.38 to 17.80	8	Entire sky is grayish or brighter. Familiar constellations are missing stars. Fairer constellations are absent. Less than 20 stars visible over 30 degrees elevation in brighter areas. Limiting magnitude from 3 to 4. CCD imaging is still possible. But telescopic visual observation is usually limited to the moon, planets, double stars and variable stars. [-ad]
	>46.77	>17.80	9	18.5: Stars are weak and washed out, and reduced to a few hundred. The sky is bright and discoloured everywhere. [- <a href="#">Richard Berry</a> ] Most people don't look up. [-ad]

[Bon Accord Observatory Clear Sky Chart](#) | [Clear Sky Chart Home](#) | [The night sky in the World](#) home page | [International Dark Sky Association](#)

# SQM (Sky Quality Meter) Readings

Reference pages six and seven of this document to identify the meter reading site for the readings listed here on page 11.



UT date/time	Type	Brightness	Zenith	Conditions	Latitude	Longitude	Site Description	User
2015-01-17 4:00	SQM-L	19.69	Up	clear, no moon	58.836502	-113.404905	Bon Accord, AB	Julia
2015-01-18 5:00	SQM-L	19.60	Up	clear, no moon	58.836502	-113.404905	Bon Accord, AB	Julia
2015-01-19 4:45	SQM-L	18.25	Up	full cloud cover	58.836502	-113.404905	Bon Accord, AB	Julia
2015-01-21 4:00	SQM-L	19.83	Up	crystal clear	58.836502	-113.404905	Bon Accord, AB	Julia
2015-01-22 4:30	SQM-L	19.33	Up	clear, no moon	58.836502	-113.404905	Bon Accord, AB	Julia
2015-01-23 4:15	SQM-L	19.83	Up	slightly cloudy	58.836502	-113.404905	Bon Accord, AB	Julia
2015-01-29 4:00	SQM-L	18.42	Up	clear, 1st quarter moon	58.836502	-113.404905	Bon Accord, AB	Julia
2015-02-24 5:00	SQM-L	18.24	Up	slightly cloudy	58.836502	-113.404905	Bon Accord, AB	Julia
2015-02-26 5:00	SQM-L	19.02	Up	clear, 1st quarter moon	58.836502	-113.404905	Bon Accord, AB	Julia
2015-03-09 4:45	SQM-L	20.01	Up	partial cloud	58.836502	-113.404905	Bon Accord, AB	Julia
2015-03-09 4:30	SQM-L	20.51	Up	partial cloud	58.835768	-113.404905	Field in Bon Accord, AB	Julia
2015-03-10 4:15	SQM-L	20.27	Up	clear, no moon	58.836502	-113.404905	Bon Accord, AB	Julia
2015-03-12 4:00	SQM-L	19.66	Up	clear, no moon	58.836502	-113.404905	Bon Accord, AB	Julia
2015-03-17 4:00	SQM-L	20.50	Up	clear, no moon	58.836502	-113.404905	Bon Accord, AB	Julia
2015-03-26 5:00	SQM-L	18.17	Up	cloudy	58.836502	-113.404905	Bon Accord, AB	Julia
2015-03-27 4:45	SQM-L	18.44	Up	cloudy	58.836502	-113.404905	Bon Accord, AB	Julia
2015-03-28 4:45	SQM-L	19.24	Up	clear, half moon	58.836502	-113.404905	Bon Accord, AB	Julia
2015-03-29 4:30	SQM-L	19.43	Up	clear, moon	58.836363	-113.404138	Bon Accord, AB	Julia
2015-03-29 4:45	SQM-L	19.88	Up	clear, moon	58.836502	-113.404905	Field in Bon Accord, AB	Julia
2015-03-31 5:00	SQM-L	19.17	Up	partial cloud, moon	58.836502	-113.404905	Bon Accord, AB	Julia
2015-04-04 5:30	SQM-L	18.02	Up	clear, full moon	58.836502	-113.404905	Bon Accord, AB	Julia
2015-04-22 5:00	SQM-L	19.60	Up	partial cloud	58.836502	-113.404905	Bon Accord, AB	Julia
2015-04-26 5:15	SQM-L	19.94	Up	clear, 1st quarter moon	58.836502	-113.404905	Bon Accord, AB	Julia
2015-05-13 5:45	SQM-L	17.40	Up	clear, moon	58.836502	-113.404905	Bon Accord, AB	Julia
2015-05-13 8:00	SQM-L	18.51	Up	clear, northern lights	58.836502	-113.404905	Bon Accord, AB	Julia
2015-01-14 6:00	SQM-L	19.91	Up	clear, no moon	58.836502	-113.404905	Bon Accord, AB	Julia

## CLEAR SKY CLOCK

<http://cleardarksky.com/c/BnAccrdABkey.html>

# Statistics from the 2011 Canadian Census:

## Education:

- High school diploma (28%)
- University certificate, below Bachelor (1%)
- College (23%)
- University degree (6%)
- Apprenticeship (21%)
- No certificate (21%)

## Major field of study:

- No post-secondary certificate; diploma or degree (50%)
- Health; parks; recreation and fitness (5%)
- Architecture; engineering; and related technologies (25%)
- Business; management; and public administration (7%)
- Other (13%)

## Occupation and industry:

- Labour force activity in Bon Accord
  - Employed (73%)
  - Unemployed (5%)
  - Not in the labour force (22%)

## Labour participation rate for Bon Accord: 78.3%

- Occupations:
  - Trades; transport and equipment operators and related occupations (30%)
  - Natural and applied sciences and related occupations (6%)
  - Sales and service occupations (27%)
  - Social sciences; education; government service and religion (6%)
  - Business; finance and administration occupations (16%)
  - Other (14%)
- Industry:
  - Educational services (5%)
  - Construction (17%)
  - Agriculture and other resource-based industries (6%)
  - Business services (13%)
  - Health care and social services (6%)
  - Manufacturing (9%)
  - Retail trade (7%)
  - Other (36%)

Median family income: \$95,502

## Now and Future

By applying for the Dark Sky Community Designation, Bon Accord is able to formalise its belief that the vision of the International Dark Sky Association overlaps the values shared by the Town. Council's vision of Bon Accord's future is encompassed by its adoption of the new brand statement 'Building for Tomorrow.' This statement is embodied by three pillars, which have always been a symbolic part of Bon Accord's crest. These three pillars now represent Culture, Education, and Environment, the last of which includes the dark sky vision. Achievement of this designation is an important part of the Town's future and direction.

Bon Accord relies on an innovative, respectful, dedicated approach to the environment, with the education and culture pillars playing an important role. Water quality, drainage, light management policy, building standards, and buying decisions are examples of Bon Accord responsibly and sustainably Building for Tomorrow. The long term sustainability of Bon Accord relies on strategic planning through to implementation; strong support and commitment to these goals through policy is necessary. Bon Accord's Light Efficient Community Policy is an ideal example of policy aligning with broader international goals.

Bon Accord is located in Sturgeon County on Highway 28, a major route to destinations in northeast Alberta, including the Province's oil sands. Bon Accord is just 20 minutes from three major urban centres; Edmonton, the provincial capital with a population of approximately one million people, Fort Saskatchewan, a city of about 22,000 people and home to most of the industrial production in the Capital region, and St. Albert, which was originally settled at a Métis community, with a population of over 63,000. In addition to these large urban centres, Bon Accord is located in the centre of Sturgeon County and surrounded by many other towns, including Gibbons, Morinville, Namao, Redwater and Legal, which is one of the oldest francophone communities west of Manitoba.

### **Municipal Development Plan**

The future of Bon Accord is outlined in the Municipal Development Plan (MDP), which is currently going through a revision and update process by Town administration and Council. The MDP forms the basis for further development and growth in the community by defining land use for a combination of future residential and commercial development. The current MDP does not define areas for light industrial growth (medium to large commercial). This type of infrastructure and growth is a critical component of any healthy community to ensure both a balanced tax base and continued employment opportunities for the community.

### **Strategic Plan**

Bon Accord's close proximity to three large urban centres, Edmonton, St. Albert, and Ft. Saskatchewan, means that it requires a unique concept to attract development, tourism and new residents to compete with other Capital Region communities. Other small communities have placed their business attraction efforts on industrial development, mature character neighbourhood main streets and large concentrated commercial centres (big box retail).



Town administration identified these common trends and chose to set off in a different and unique direction to increase development and attract businesses who share this philosophy. Applying the culture, education and environmental pillars to the new development strategy, the Town is exploring the logistics of building and operating a public observatory to the community as a centrepiece of development. A business plan has been developed by administration laying out the business case for this new development identifying tourism market trends including cultural tourists. This observatory would complement the Telus World of Science in Edmonton and the Margaret Zeidler planetarium, as well as dark sky events held at Elk Island National Park. In addition to the Telus World of Science, the University of Alberta operates an observatory, however the one located in Bon Accord would be the only one designed for use as a functioning public observatory. This facility would implement and supplement educational programming in local schools as well as schools in the Edmonton Capital Region and allow integration into the global observatory network.

## Supporting the Strategic Plan through Policy

As Bon Accord's strategic plan has evolved from creation through to implementation, strong support and commitment is necessary. Bon Accord's Light Efficient Community Policy adopted in February 2012 and its successor document included in this application is guiding Council and Administration in the use of efficient and environmentally responsible lighting. The lighting policy helps minimize energy waste, reduces energy costs, and helps preserve the natural environment. It is also critical in establishing standards for the Town's infrastructure in order to maintain the night sky. It is the belief of Town Administration and Council that this current policy adopted February 17, 2015 surpasses the minimum requirements of the Municipal Lighting Ordinance (MLO).

Creating awareness of the strategic plan and associated policies occurs at several existing events in the Town, such as the Summer Skies Equinox Festival. Events are designed to build partnerships with groups who play a role in the implementation of the strategic plan and policies. More importantly the events allow the Town and the community to unite and jointly enjoy the incredible potential of science and art activities in the Town of Bon Accord.



3D aerial fly around rendering



promotional video for investment attraction

To view Bon Accord's You Tube Channel go to <https://www.youtube.com/user/BonAccordAB>

34th annual  
**SUMMER SKIES**  
**Equinox**  
Sept 20  
10am-10pm

Pancake Breakfast  
10am-Noon

Geocaching  
10am-2pm

Kids Activities  
Noon-4pm

Art Marathon  
3pm-9:30pm

Street Performers  
3pm-6pm

Long Table Dinner  
5:30pm-7pm

Evening Street Performers  
6pm-9:30pm

Sidewalk Astronomy  
6pm-9:30pm

Twilight Tea  
7pm-8pm

Light Parade  
9:30pm-9:45pm

Fireworks  
9:45-10pm

Come  
celebrate  
the skies  
with us in  
Bon Accord!

**Cosmic Carnival**

[www.summer-skies-equinox.com](http://www.summer-skies-equinox.com)

Bon Accord, AB

Bon Accord & District  
Agricultural Society

sturgeon county  
**bounty**

**Williams**

**Agrium**

**FORTIS ALBERTA**

*Allypad Lane*

Scheller Andrew Ltd  
Planners & Designers

EDMONTON INTERNATIONAL  
STREET PERFORMERS  
FESTIVAL

In partnership with  
**Travel Alberta**  
Canada

## Tourism & Recreation

The Bon Accord Observatory Park is an exciting part of the future of tourism in the Capital Region. Council has directed Town Administration to embark on refining the business plan document and developing fundraising packages. As new funding sources are confirmed, the project development will continue to progress, followed by securing a site. Once all capital funding for the project is secured, detailed design of the facility will commence followed by construction and eventual ongoing operations. Town Administration has been in close consultation with the Associate Dean of Business at the University of Alberta to ensure a comprehensive and successful business plan is created and executed. This business plan is designed to spark further commercial and retail activity within Bon Accord, in addition to the significant business and tourism activity the facility itself will attract.

Current tourism activity in the Bon Accord area is well established, with several large attractions already operating in the area. Bon Accord's close proximity to the Edmonton Capital Region allows for easy access and day trips to the area. The area is served by many educational and outdoors activities for families and couples. However nearly all of these existing activities have a daytime focus, which would allow the Observatory to capitalise on a pre-existing tourist base while complementing those attractions instead of reducing their attractiveness. As part of the business case for the Observatory, several studies were commissioned to research the business case.





Other annual events which draw tourists to Bon Accord include Harvest Days, Summer Skies Equinox festival, and Winter Wonderland. The Equinox Festival strongly supports Bon Accord's cultural, educational, and environmental pillars and is one of Bon Accord's feature initiatives. It is designed to unite the community and showcase the Town's pride and appreciation of the global environment, while providing the opportunity to connect science and artistic components of society. The first year of the Summer Skies Equinox, presented the community with its first opportunity to learn about and appreciate the history, culture, and society of the ancients based on the sky. Now with the Equinox coming into its fourth year industry partners, sponsors and community groups continue to enhance the dark sky festival each and every year. Partners for the festival are expanding throughout the province and the Town has been instrumental in reaching out to other dark sky festivals to co-market all of them in a festival series in September and October. Additionally, Bon Accord is home to art and craft shows and open houses hosted by local artisans, community groups and businesses.

Within the Town, local artisans and businesses include talented and industrious craftspeople, creating local pottery, stained glass, painters, jewellers, and woodcrafts. R&R Delights is a working stained glass studio offering personal and unique items. Pottery by Heather is operated by artisan Heather Edwards, whose pottery studio is open year round offering hand-crafted pottery. Edwards' studio is recommended by the Edmonton Regional Tourism Group as one of Edmonton's Countryside experiences.

The country outside of Edmonton and surrounding Bon Accord offers many other unique tourist establishments and destinations. Prairie Gardens and Adventure Farm, Jurassic Forrest, Goose Hummock Golf Resort, and Toula's House of Clay make up the preeminent attractions outside of Bon Accord. Prairie Gardens and Adventure Farm showcases the area's agricultural heritage and hosts several family events throughout the year. By offering a unique family atmosphere, Prairie Gardens allows visitors an opportunity to sample local food and unique shopping opportunities to over 50,000 visitors. Jurassic Forest and Learning Centre features over 50 life sized and realistic animatronic exhibits nestled in a 40-acre natural forest and wetland environment. They are located just minutes from Bon Accord, but millions of years from the present. A first-class golfing experience is just northeast from Bon Accord. "The Goose" was designed by Bill Robinson from Oregon and is an 18 hole public championship course. It is a combination of Scottish and everglades architecture that twists and turns for 6700 yards through interlocking ponds. Toula's House of Clay is a studio that specialises in replicating architecture and promotes other artist's work. McLeod Creek Farm provides rural excursions with hayrides, horseback riding and farm tours, while the Alberta Pioneer Railway

Come and  
experience  
sky stories  
of the  
centuries!

Music, artists, telescopes  
food and fun for the  
whole family under  
the night skies  
of Bon Accord!

4th annual

# equinox

Bon Accord

[www.bonaccord.ca/equinox](http://www.bonaccord.ca/equinox)

5pm-11pm

September 19, 2015

Bon Accord, Alberta

Museum is open weekends and  
holidays May through September.

Bon Accord's facilities include an  
ice hockey arena, a sports field, and  
a number of recreational parks for  
community and area residents.  
Sporting activities such as softball,  
hockey, soccer, cross country skiing,  
an adult outdoor fitness park and  
volleyball are the most prominent  
activities in Bon Accord.

Additional recreational amenities  
in Sturgeon County include easy  
access to Cardiff Park, which  
offers walking trails, picnic areas,  
and several sports fields. Cardiff  
Lake, in Sturgeon County, also  
offers opportunities for local trout  
fishing, while Oak Hill Junction is a  
beautiful rest area offering families  
a quiet picnic area. In addition to  
Goose Hummock Golf Course,  
Spring Creek Golf Course is a family  
owned, eighteen hole, executive  
par three family golf course.

## Education

One of the biggest beneficiaries of the recognition of Bon Accord, and its efforts to become Dark Sky friendly will be education, not just in Bon Accord but in Sturgeon County and beyond. Currently if teachers wish to take their students to a planetarium or observatory they must take an entire day to transport the students to downtown Edmonton and the Telus World of Science of the University of Alberta Observatory.

By providing the impetus further development of the Bon Accord Observatory, the Town will be providing an invaluable resource in its own back yard. Literally. Not only that, but due to their locations in the heart of Edmonton, the Telus World of Science and the University of Alberta Observatory suffer from a degradation of the night sky caused by light pollution in Edmonton.

By passing a bylaw and creating a working policy, Council and Town Administration have ensured that even as Bon Accord pursues responsible growth, the integrity of the night sky will remain constant, preserving the natural beauty of the night sky for generations to come.

Highlights have been included from the Alberta science curriculum, specifically the grades which include study of the night sky as a showcase for how Albertans value the ability to see the wonder of the stars. At the end of the curriculum overview, the Town was able to get the perspective of students and a faculty member explaining why they think continued dark skies are important to the community.

Additionally, Town Administration has committed to giving one presentation per year to grade 6 students at Lillian Schick as long as the Town holds an International Dark-Sky Community designation.

# Alberta Education Elementary Science Program Overview

## Rationale

Children have a natural curiosity about their surroundings—a desire to explore and investigate, see inside things, find out how things work and find answers to their questions. Learning about science provides a framework for students to understand and interpret the world around them. An elementary science program engages students in a process of inquiry and problem solving in which they develop both knowledge and skills. The purpose of the program is to encourage and stimulate children’s learning by nurturing their sense of wonderment, by developing skill and confidence in investigating their surroundings and by building a foundation of experience and understanding upon which later learning can be based.

Elementary and secondary science programs help prepare students for life in a rapidly changing world – a world of expanding knowledge and technology in which new challenges and opportunities continually arise. Tomorrow’s citizens will live in a changing environment in which increasingly complex questions and issues will need to be addressed. The decisions and actions of future citizens need to be based on an awareness and understanding of their world and on the ability to ask relevant questions, seek answers, define problems and find solutions.

**Philosophy: The science program of studies is built on the following principles.**

- **Children’s curiosity provides a natural starting point for learning.**

Young children are natural inquirers and problem solvers. They have a keen interest in the materials around them and move naturally into activities that involve manipulation of materials, exploration and discovery. Science in the elementary school years should nurture and extend this curiosity, so that students continue to question, explore and investigate, with increasing levels of insight and skill.

- **Children’s learning builds on what they currently know and can do.**

Children’s initial concepts of the world influence what they observe and how they interpret the events they experience. They enter school having learned a great deal about their world through play and exploration. They show extensive practical knowledge about materials in their environment, as well as the ability to observe, question, test, construct and create. Science experiences in the elementary years are designed to build on the knowledge that students already have and to extend and sharpen their investigative skills.

As children progress in learning, they add to their knowledge and modify their ideas and ways of viewing the world. Where, in the early years, children view their experiences as personal and immediate; in later years, they become aware of order and continuity in the world extending beyond their personal experience. As they grow in this awareness, they discover new patterns in things—patterns of structure, patterns in the order of events and patterns in the way that materials interact. The science program is designed to assist students in discovering and interpreting these patterns and to help them connect new ideas with their existing knowledge.

- **Communication is essential for science learning.**

Language provides a means for students to develop and explore their ideas and to express what they have learned. By communicating their questions, observations, discoveries, predictions and conclusions, they can refine and consolidate their learning and identify new

connections and avenues to explore. As children relate their experiences and ideas to one another, they naturally make new connections that are not fully realized until they are put into words.

Language also plays a role in developing the skills of inquiry and problem solving. The actions of identifying problems, asking questions and proposing ideas requires the use of a particular kind of language. The ability to define problems and ask clear questions is a keystone to growth in this area.

- **Students learn best when they are challenged and actively involved.**

Students learn best when they become personally involved in their learning—not just when they mechanically follow a set of steps or read and hear about things learned and done by others. Active inquiry and problem solving can be stimulated by providing an initial focus and challenge for learning, by engaging students in developing or adapting a plan of action and by involving students in evaluating results. By participating in activities and reflecting on the meaning of what they do, students develop the skills of learning how to learn and achieve depth in their understanding.

- **Confidence and self-reliance are important outcomes of learning.**

Children develop confidence when their ideas and contributions are valued and when there is a supportive climate for learning. By providing opportunities for students to explore ideas and materials, engage in open-ended activities and evaluate their own progress, they can be encouraged to take initiative in learning. When questions and problems are referred back to students and their ideas and decisions are supported, they learn to become more self-reliant. Confidence is achieved as students recognize that the knowledge and skills they have gained enable a measure of independent action.

The personal skills that students develop in school—the ability to make decisions, to plan and to evaluate their own progress—are skills that apply throughout life.

### **Program Emphasis**

Children learn to inquire and solve problems in a variety of contexts. Each subject area within the elementary program provides a rich source of topics for developing questions, problems and issues that provide starting points for inquiry and problem solving. By engaging in the search for answers, solutions and decisions, students have a purpose for learning and an opportunity to develop concepts and skills within a meaningful context.

The learner expectations for the elementary science program are linked to two main areas of skill emphasis: science inquiry and problem solving through technology. The skills developed in these two areas are related, but have a somewhat different focus. In science inquiry, the focus is on asking questions and finding answers based on evidence. The outcome of inquiry is knowledge. In problem solving through technology, the focus is on practical tasks – finding ways of making and doing things to meet a given need, using available materials. The outcome of problem solving is a product or process that a person can use.

### **Science Inquiry**

Inquiry is the process of finding answers to questions. The skills of science inquiry include asking questions, proposing ideas, observing, experimenting, and interpreting the evidence that is gathered. Observation and evidence are key elements.

An inquiry may be initiated in a variety of ways. It may be based on a question brought to the classroom by a teacher or student; or it may arise out of an activity, an interesting observation, an unexplained event or a pattern that appears worth pursuing. Engagement in inquiry is not a linear process; it can have a variety of starting points, and the steps followed may vary from one inquiry activity to another. When an unexpected observation is made or a procedure does not work, there is opportunity for new ideas to emerge and a new set of procedures to be followed.

### **Problem Solving through Technology**

Problem solving refers to a variety of processes used to obtain a desired result. The skills of problem solving include identifying what is needed, proposing ways of solving the problem, trying out ideas and evaluating how things work. In problem solving, as in inquiry, the process is usually not a linear one. Often, processes that will be needed to solve a problem are not foreseen in advance; and there may be repeated cycles of reflection, developing new ideas and trying new approaches, all within the larger pattern of the activity.

Challenging problems require persistence. An idea may not work at first; but with careful observation, adjustment, reflection and refinement, a solution that is close to the original idea may be found. Student success in inquiry and problem solving is enhanced when students have the opportunity to explore materials in an unstructured way, before starting formal investigations. Progress frequently involves trial and error, in which initial ideas are discarded and new ideas and processes are developed. A supportive climate for trying new ideas can be critically important to the development of student confidence and competence in their investigative skills.

# Grade 6 Science Subjects

## Topic C: Sky Science

### Overview

Students learn about objects in the day and night sky. Through direct observation and research, students learn about the motions and characteristics of stars, moons and planets. Using simple materials, such as balls and beads, students create models and diagrams which they use to explore the relative position and motion of objects in space. As a result of these studies, students move from a simple view of land and sky, to one that recognizes Earth as a sphere in motion within a larger universe. With new understanding, students revisit the topics of seasonal cycles, phases of the Moon and the apparent motion of stars.

### General Learner Expectations

#### Students will:

6–7 Observe describe and interpret the movement of objects in the sky; and identify pattern and order in these movements.

### Specific Learner Expectations

#### Students will:

1. Recognize that the Sun and stars emit the light by which they are seen and that most other bodies in space, including Earth's Moon, planets and their moons, comets, and asteroids, are seen by reflected light.
2. Describe the location and movement of individual stars and groups of stars (constellations) as they move through the night sky.
3. Recognize that the apparent movement of objects in the night sky is regular and predictable, and explain how this apparent movement is related to Earth's rotation.
4. Understand that the Sun should never be viewed directly, nor by use of simple telescopes or filters, and that safe viewing requires appropriate methods and safety precautions.
5. Construct and use a device for plotting the apparent movement of the Sun over the course of a day; e.g., construct and use a sundial or shadow stick.
6. Describe seasonal changes in the length of the day and night and in the angle of the Sun above the horizon.
7. Recognize that the Moon's phases are regular and predictable, and describe the cycle of its phases.
8. Illustrate the phases of the Moon in drawings and by using improvised models.

- An improvised model might involve such things as a table lamp and a sponge ball.
9. Recognize that the other eight known planets, which revolve around the Sun, have characteristics and surface conditions that are different from Earth; and identify examples of those differences.
  10. Recognize that not only Earth, but other planets, have moons; and identify examples of similarities and differences in the characteristics of those moons.
  11. Identify technologies and procedures by which knowledge, about planets and other objects in the night sky, has been gathered.
  12. Understand that Earth, the Sun and the Moon are part of a solar system that occupies only a tiny part of the known universe.

## Alberta Education Science Grades 7-8-9 Program of Studies Grade 9 Science Subjects

### Unit E: Space Exploration

#### Overview

Technologies have played an essential role in the study of space and in the emerging use of space environments. Our modern understanding of space has developed in conjunction with advances in techniques for viewing distant objects, for transmitting images and data through space, and for manned and unmanned space exploration. A study of space exploration provides an opportunity for students to examine how science and technology interact and to learn how one process augments the other. Students become aware that technologies developed to meet the challenges of space are applied to new purposes.

#### This unit builds on:

- Grade 6 Science, Topic C: Sky Science

#### This unit provides a background for:

- Science 30, Unit C: Electromagnetic Energy

**Focusing Questions:** How have humans attained a presence in space? What technologies have been developed and on what scientific ideas are they based? How has the development of these technologies contributed to the exploration, use and understanding of space and to benefits on Earth?

#### Key Concepts

The following concepts are developed in this unit and may also be addressed in other units at other grade levels. The intended level and scope of treatment is defined by the outcomes below.

- Technologies for space exploration and observation
- Reference frames for describing position and motion in space
- Satellites and orbits
- Distribution of matter through space
- Composition and characteristics of bodies in space
- Life-support technologies
- Communication technologies

## **Outcomes for Science, Technology and Society (STS) and Knowledge**

### **Students will:**

1. Investigate and describe ways that human understanding of Earth and space has depended on technological development.
  - Identify different ideas about the nature of Earth and space, based on culture and science (e.g., compare geocentric and heliocentric models [Note: knowledge of epicycles is not required]; describe Aboriginal views of space and those of other cultures; describe the role of observation in guiding scientific understanding of space).
  - Investigate and illustrate the contributions of technological advances—including optical telescopes, spectral analysis and space travel—to a scientific understanding of space .
  - Describe, in general terms, the distribution of matter in star systems, galaxies, nebulae and the universe as a whole.
  - Identify evidence for, and describe characteristics of, bodies that make up the solar system; and compare their composition and characteristics with those of Earth.
  - Describe and apply techniques for determining the position and motion of objects in space, including:
    - Constructing and interpreting drawings and physical models that illustrate the motion of objects in space.
    - Describing in general terms how parallax and the Doppler effect are used to estimate distances of objects in space and to determine their motion.
    - Describing the position of objects in space, using angular coordinates (e.g., describe the location of a spot on a wall, by identifying its angle of elevation and its bearing or azimuth; describe the location of the Sun and other stars using altitude-azimuth coordinates, also referred to as horizon coordinates or local coordinates) [Note: A description of star positions based on right ascension and declination is not required.]
  - Investigate predictions about the motion, alignment and collision of bodies in space (e.g., investigate predictions about eclipses; identify uncertainties in predicting and tracking meteor showers).
2. Identify problems in developing technologies for space exploration, describe technologies developed for life in space, and explain the scientific principles involved.
  - Analyze space environments, and identify challenges that must be met in developing life-supporting systems (e.g., analyze implications of variations in gravity, temperature, availability of water, atmospheric pressure and atmospheric composition)
  - Describe technologies for life-support systems, and interpret the scientific

principles on which they are based (e.g., investigate systems that involve the recycling of water and air).

- Describe technologies for space transport, and interpret the scientific principles involved (e.g., describe the development of multistage rockets, shuttles and space stations; build a model vehicle to explore a planet or moon).
  - Identify materials and processes developed to meet needs in space, and identify related applications (e.g., medicines, remote sensing, microelectronics, polymers, medical imaging, wireless communication technologies, synthesis of fuels).
  - Describe the development of artificial satellites, and explain the major purposes for which they are used (e.g., communication, GPS—global positioning system, weather observation).
3. Describe and interpret the science of optical and radio telescopes, space probes and remote sensing technologies.
- Explain, in general terms, the operation of optical telescopes, including telescopes that are positioned in space environments.
  - Explain the role of radio and optical telescopes in determining characteristics of stars and star systems.
  - Describe and interpret, in general terms, the technologies used in global positioning systems and in remote sensing (e.g., use triangulation to determine the position of an object, given information on the distance from three different points) [Note: This example involves the use of geometric approaches rather than mathematical calculations.]
4. Identify issues and opportunities arising from the application of space technology, identify alternatives involved, and analyze implications.
- Recognize risks and dangers associated with space exploration (e.g., space junk, fuel expenditure, satellites burning up in the atmosphere, solar radiation).
  - Describe Canadian contributions to space research and development and the astronaut program (e.g., Canadarm).
  - Identify and analyze factors that are important to decisions regarding space exploration and development (e.g., identify examples of costs and potential benefits that may be considered; investigate and describe political, environmental and ethical issues related to the ownership and use of resources in space).

## **Outcomes for Skills (focus on problem solving)**

### **Initiating and Planning**

#### **Students will:**

Ask questions about the relationships between and among observable variables, and plan investigations to address those questions

- Identify practical problems (e.g., identify problems that must be addressed in developing a life-supporting space environment)
- Propose alternative solutions to a given practical problem, select one, and develop a plan (e.g., design and describe a model of a technology to be used in a space station)
- State a prediction and a hypothesis based on background information or an observed pattern of events (e.g., predict the next appearance of a comet, based on past observations; develop a hypothesis about the geologic history of a planet or its moon, based on recent data).

## **Performing and Recording**

### **Students will:**

Conduct investigations into the relationships between and among observations, and gather and record qualitative and quantitative data

- Research information relevant to a given problem
- Select and integrate information from various print and electronic sources or from several parts of the same source (e.g., compile and compare information about two exploratory missions).
- Organize data, using a format that is appropriate to the task or experiment (e.g., maintain a log of observed changes in the night sky; prepare a data table to compare various planets).

## **Analyzing and Interpreting**

### **Students will:**

Analyze qualitative and quantitative data, and develop and assess possible explanations

- Test the design of a constructed device or system (e.g., create and test a model device for remote manipulation of materials).
- Identify and correct practical problems in the way a prototype or constructed device functions (e.g., identify and correct problems in the functioning of a model “remote transportation device” that they have designed and built).
- Identify the strengths and weaknesses of different methods of collecting and displaying data (e.g., compare Earth-based observations with those made from spacecraft).
- Identify new questions and problems that arise from what was learned (e.g., identify questions to guide further investigation, such as: “What limits the travelling distance and duration of space exploration?”, “How old are the planets, and how did they form?”).

## **Communication and Teamwork**

### **Students will:**

- Work collaboratively on problems; and use appropriate language and formats to communicate ideas, procedures and results.
- Receive, understand and act on the ideas of others (e.g., take into account advice provided by other students in designing a model space suit or space vehicle).
- Work cooperatively with team members to develop and carry out a plan, and troubleshoot problems as they arise (e.g., write and act out a skit to demonstrate tasks carried out by astronauts on a mission).
- Defend a given position on an issue or problem, based on their findings (e.g., conduct research to justify their position on the economic costs or benefits of space exploration).

Equinox interpretive ride  
from Summer Skies Equinox 2012

(Horse and wagon tour to  
ancient cultural sites in  
Bon Accord for  
constellation sky stories)



## Teacher and Student Input about importance of Dark Skies

To Whom It May Concern,

Bon Accord is currently under consideration to receive Dark Sky designation. If the town were to get it, the community schools could benefit in a variety of ways. First of all, there are direct curriculum links in grade 6 and 9 science, which would create opportunities for discussion and cross-curricular activities that would promote dark skies. Secondly, the community awareness of the night sky would create a growing interest in the town, and as a result, will promote real-life connections in student learning. Promoting dark skies will garner an appreciation for nature, science and technology and build community and school spirit.

Shauna Sudyk  
Elementary teacher  
Lillian Schick School

“I think it would be awesome for Bon Accord to become a Dark Sky Preserve because sooo [sic] many places have so much light pollution that you can’t even see any stars some nights. It would be amazing for Bon Accord to become a safe haven for Astronomers and hobbyists alike. The stars and constellations amaze me and I want to be able to see them.”

Mark Inkster  
Grade 6 student, Lillian Schick School

"It would be awesome if Bon Accord was a dark sky sanctuary because Bon Accord is in the middle of the country and has lots of clear open land. Great for sky gazing because you have nothing to block your vision. And Bon Accord is at least a few miles away from any major city. (Gibbons is only a few miles away and is much bigger than Bon Accord and it may interfere with Bon Accord being a dark night sanctuary because of light pollution) but besides that I think that Bon Accord can become a great dark night sanctuary."

Levi Hostyn  
Grade 6 student, Lillian Schick School

"It would be awesome if Bon Accord became a dark sky preserve [sic] because people from the surrounding area may come to see as there are not many towns that are dark sky preserves[sic]. For example, there is lots of light pollution in Edmonton so they wouldn't get to see half the stars we might get to see. A dark sky preserve [sic] may also increase population and tourism in Bon Accord as people may like astronomy. It might of [sic] helped with Jaspers's population because Jasper has plenty of tourism. It may help the population to grow a lot for the future. This would help people that want to use telescopes get the opportunity to use them and clearer image of the stars and planets. I would enjoy this change to Bon Accord very much and would use the opportunity if changes were done."

Rachel Seibel  
Grade 6 student, Lillian Schick School



## Letters of Support

The recognition of Bon Accord's attempt to niche itself as a International Dark Sky Community and crosses the gamut of government, education, community and business. The Town's marketing of dark sky considerations for health, environment ,and cultural importance have been resonating well since the branding of Bon Accord in 2012.

P.O. Box 779, 5025 – 50 Avenue  
Bon Accord AB T0A 0K0



Phone: 780 921 3550  
Fax: 780 921 3585

April 15, 2015

International Dark-Sky Association  
3223 N. First Avenue  
Tucson AZ 8571  
USA

Attention: Board of Directors

Dear IDA Board of Directors:

**RE: International Dark Sky Community Designation for Town of Bon Accord**

As the custodian of the Town's IDA membership, and as the Chief Administrative Officer for the Town, I am honored to support the nomination of Bon Accord for the International Dark Sky Community designation. If this application is successful, Bon Accord would be the first community in Canada to receive this prestigious designation.

In 2012, the Town began transforming into a Light Efficient Community. To date, the Town building, park and Town frontage lighting has been retrofitted with the appropriate luminaires to set an example and endorse this initiative. By Fall of 2015, all street lights shall be retrofitted to comply with Bon Accord's new Light Efficient Community Policy, which meets or exceeds the conditions specified by the IDA. The Light Efficient Community Policy is expected to be complete by March, 2015. This is a powerful example of the commitment of the Town to dark skies. Additionally, since 2012, Bon Accord has an annual Equinox celebration and is a partner with Travel Alberta to create dark sky experiences.

Residents throughout Bon Accord value their ability to view the night sky and acknowledge its importance to our community. The overall brand message of the community has incorporated an education and environmental message of Bon Accord being a dark sky community and reasons why. In all outward marketing throughout the province and the region, it is a primary message relating to tourism experiences. The Town is hopeful that it will be recognized for its efforts to preserve one of its most valued natural assets and be awarded the International Dark Sky Community designation.

Yours truly,



Vicki Zinyk  
Chief Administrative Officer  
International Dark Sky Association Member  
/lc

[www.bonaccord.ca](http://www.bonaccord.ca)

**BON ACCORD....building for tomorrow**



Box 300, Bon Accord, Alberta T0A 0K0  
Ph: (780) 921-3559 Fax: (780) 921-2539  
Email: baccord@sturgeon.ab.ca



International Dark-Sky Association  
c/o Town of Bon Accord  
3223 N First Avenue  
Tuscon, Arizona 85719  
USA

To whom it may concern;

I am writing this letter in support of the Town of Bon Accord as it seeks your designation as a Dark Skies Community.

I have had the privilege of working in Bon Accord for over 7 years now as a school teacher and administrator. I believe that Bon Accord is committed to the reduction of light pollution and enhancing their economic future by promoting the town as a great place to visit if people want to view a clear night sky.

I see this initiative as a value to my students. In fact, some students have talked to me about passed dark skies events held by the town. In some cases, such events have sparked curiosity in astronomy that may last a lifetime.

Please consider Bon Accord for your Darks Skies Community Designation.

Yours truly

Grant Jensen  
Acting Principal  
Bon Accord Community School



[www.leaderinme.org](http://www.leaderinme.org)



Bon Accord Public Library  
Box 749  
Bon Accord, Alberta

International Dark-Sky Association  
Dark Sky Places Committee  
3223 N First Avenue  
Tucson, Arizona  
85719USA  
January 20, 2015

Dear Sir or Madame

I am the manager of a lovely public library in small town northern Alberta. The home of the Northern Lights and Boreal Forests. In the past watching the Aurora Borealis dance across the sky on a winters night was a regular pass time. The brilliant colors of red and green would fascinate everyone young and old.

Now with the increase in our population and our towns and cities growing at an alarming rate it is sad that we are unable to see the lights any longer. Bon Accords new initiative of Dark-Sky gives me hope that some day we will once again be able to enjoy our natural beauty in our sky.

The town and the library have been working together to educate and encourage our residents and visitors to come and celebrate our efforts. We have a huge celebration for Equinox in September with hundreds of people from as far away as Edmonton and Sherwood Park attending. There are entertainers, artists, presentations and prizes galore. We have telescopes set up to share the sky with everyone. The library holds space and astronomy related contests and crafts for our young people and we have talks on space and astronomy for the adults. We have added books, Imax movies, puzzles and more to our collection so our young people can learn the importance of a Dark-Sky.

I believe our town would benefit from your Dark-Sky designation because not only would it allow our residents to once more enjoy it but it would draw people from the surrounding areas and large towns and cities here to study and discover the amazing Dark-Sky world.

Thank you

Peggy C. Teneycke  
Manager Bon Accord Public Library  
librarian@bonaccordlibrary.ab.ca

P.O. Box 779, 5025 – 50 Avenue  
Bon Accord AB T0A 0K0



Phone: 780 921 3550  
Fax: 780 921 3585

January 20, 2015

**Re: International Dark Sky Community Designation for Town of Bon Accord, AB**

To whom it may concern:

In 2012, the Town of Bon Accord embarked on a strategy to promote development while maintaining a high quality of life as an asset of a rural municipality. Through development of a brand, based on seeking a niche market to build a message to stakeholders, whether it was a new business or residence, the Town looked at its existing assets as a community. One of those assets is an excellent night sky 20 minutes away from a city of approximately one million people.

With a new economic development focus with an emphasis on tourism, the Town saw an opportunity to promote the night sky as a tourism asset to the Alberta Capital Region and beyond. Since 2012, Bon Accord has been promoting itself as a dark sky community and Council passed a first generation policy as a Light Efficient Community.

Since that time, the brand and marketing strategy has matured with an economic development direction that incorporates a concept of a multi-use facility. This facility houses a public observatory surrounded by commercial and residential development, with a plan to attract business, new residents and tourists.

With an internationally recognized designation and the first in Canada to have achieved this designation, Bon Accord Town Council fully supports this application, which will be highly valued when successfully attained.

Mayor, Randolph Boyd

Deputy Mayor, Greg Mosychuk

Councillor, Alex MacKenzie

Councillor, Lorna Pocock

Councillor David Hutton

[www.bonaccord.ca](http://www.bonaccord.ca)

**BON ACCORD....building for tomorrow**



Dora L'Heureux  
Stakeholder Relations Manager  
Customer Service

**FortisAlberta Inc.**  
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St. Albert, Alberta T8N 7L3  
Tel: 780-675-8262  
Fax: 866-352-5962  
Cell: 780-288-1588  
dora.lheureux@fortisalberta.com  
www.fortisalberta.com

November 25, 2014

International Dark Sky Association

**RE: International Dark Sky Community Designation for the Town of Bon Accord**

On behalf of FortisAlberta, I endorse the efforts of the Town of Bon Accord relating to lighting efficiency and the Town's efforts in public education through events and other outreach relating to dark sky and light efficiency awareness.

FortisAlberta is a proud sponsor of the Towns Summer Skies Equinox and has been since inception. We recognize this event as a proactive, yet non-evasive way to educate and engage the public on the cultural and unique experiences of the night sky.

We are presently working with the Town to retrofit all street light heads throughout the community to ensure the appropriate Backlight, Uplight and Glare (BUG) rating qualifies as dark sky friendly based on the BUG rating determined by the Illumination Engineering Society of North America.

FortisAlberta comprehends the importance of this designation for their economic and tourism development strategy. We look forward to a continued partnership with the Town of Bon Accord and wish them success in reaching their goal in the development of their public observatory.

Respectfully,

*D L'Heureux*

Dora L'Heureux  
Stakeholder Relations Manager



P<sup>1</sup> 780.921.2444

P<sup>2</sup> 780.421.7222

info@goosehummock.com

PO BOX 1260

Gibbons, AB T0A 1N0

WWW.GOOSEHUMMOCK.COM

January 15, 2015

International Dark Sky Association  
c/o Town Of Bon Accord, AB  
3223 N First Avenue  
Tucson, Arizona USA  
85719

To Whom It May Concern,

Please accept this letter as an indication of our support of the application being submitted by the Town of Bon Accord to gain the valued designation as a Dark Sky Community.

As a vested business and sporting / lifestyle partner with the Town of Bon Accord on numerous ventures designed to enhance and support the ever-growing rural lifestyle, this new Dark Sky / Starry Sky initiative is a welcomed addition to this overall objective.

As a golf course we take great pride in blending a sporting facility with our localized flora and fauna elements. Further to this, we believe the benefits of a healthy and natural environment and the preservation of a starry sky as a valued natural resource is very appropriate for us, our community and the guests that frequent our establishment.

We wholeheartedly support the Town of Bon Accord and their endeavours to enhance the lives of the people that have the pleasure of calling Bon Accord their home.

Sincerely

Greg Sues  
General Manager



LEGISLATIVE ASSEMBLY  
ALBERTA

**Honourable Jeff Johnson**  
**MLA, Athabasca-Sturgeon-Redwater**  
**Minister of Seniors**

January 13, 2015

International Dark-Sky Association  
3223 N First Avenue  
Tucson, Arizona 85719  
USA

Dear Dark Sky Places Committee,

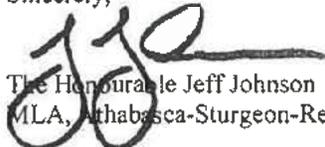
I am writing this letter in support of the Town of Bon Accord's application to become an International Dark Sky Community. Bon Accord would be the first community in Canada to receive this prestigious designation, and the second location in Canada to receive recognition from the IDA for its efforts to ensure the night skies stay starry for generations to come.

Bon Accord is located in the southern part of the Athabasca-Sturgeon-Redwater constituency, and I have represented the area since 2008. While travelling this vast, primarily rural riding I have gained a great appreciation for the truly dark skies unmarred by artificial light. In 2012, Bon Accord began seriously tackling the issue of light pollution and sky glow. The first Summer Skies Equinox event was first held in September of that year. The themes of this event are culture, education and the environment, which form the cornerstone of the Town's brand and strategic plan. This annual event, now in its third year, embraces learning about and experiencing part of the world we often take for granted, the sky above.

Part of the *Alberta Advantage* has always been the beauty of the land. From the vast Rocky Mountains in the west to the rolling prairies in the east, Alberta is known for its picturesque beauty. Tourism opportunities in Alberta range from the traditional to the unique, and by embracing the night sky Bon Accord has tapped into one of the oldest activities in history, stargazing. By embracing this ancient pastime Bon Accord has set themselves apart from other communities in the area and is providing complementary events to several existing tourism destinations in the area.

As the MLA representing Bon Accord, and on behalf of the Government of Alberta, I urge the International Dark-Sky Association to recognize the efforts of Bon Accord in limiting and reducing light pollution in order to improve the quality of the night sky. This recognition is a benefit to Alberta, and will add to conservation and tourist efforts undertaken by Bon Accord to ensure enjoyment of the vast prairie skies for generations to come.

Sincerely,



The Honourable Jeff Johnson  
MLA, Athabasca-Sturgeon-Redwater

*Legislature Office*  
424 Legislature Building  
10800 - 97 Street  
Edmonton, AB. T5K 2B6  
Phone: (780) 415-9550  
Fax: (780) 415-9411

*Constituency Office*  
4807 - 50 Street  
Athabasca, AB. T9S 1C8  
Phone: (780) 675-3232  
Fax: (780) 675-2396



***Lilian Schick School***  
*P.O. Box 689 4509 – 54 Avenue*  
*Bon Accord, Alberta T0A 0K0*  
*Phone: (780)921-2200 Fax: (780)921-3113*



To: International Dark-Sky Association,

January 6, 2015

It is with great pleasure that I write this letter of support to you in regards to the Town of Bon Accord's application for Designation as a Dark-Sky Community. Bon Accord is a beautiful community. As Principal of the Grades 5-9 School, this designation is important to our values in the community. Our sky is a wonderful natural resource which provides students and families the opportunity to enjoy and discover stars, planets, comets, the moon, and other wonderful natural experiences such as meteor showers and eclipses. Many of these are studied in school, particularly in Grade 6 in the Sky Science Unit, or in Grade 9 in Space Exploration. I've often seen students creating scale diagrams of planets, discussing our solar system, or learning about satellites. Many students are very interested in this topic, and will research independently or take books from our library on the topic on space exploration, astronauts, or technology in space. I believe that supporting the Dark-Sky Designation will show students that we value this resource we have, and will take steps to protect it.

As well, we often hear of efforts to protect our Oceans, fresh water supply, or earth's natural resources, but rarely hear about efforts to protect our natural dark sky. Raising awareness of this natural resource and celebrating a designation in this area would show students and our community that we value sustainable development, as well as our earth's wonder. Each year, we participate in Earth Day as a school, and support turning off our devices and connecting with nature and with people. This would be another way to show support of our natural resources.

For these reasons I would first applaud you for valuing and working hard to protect our dark-skies, and would ask that you help us support along with you by supporting our application for becoming a Dark-Sky Community. Please feel free to call if you have any questions or concerns.

Sincerely,

A handwritten signature in black ink, appearing to read "Steven Langer".

Steven Langer, Principal  
Lilian Schick School  
Sturgeon School Division  
780-921-2200



T 780 470 2446  
E [info@jurassicforest.com](mailto:info@jurassicforest.com)  
Edmonton, AB  
Canada  
JURASSICFOREST.COM

January 15, 2015

International Dark Sky Association  
c/o Town Of Bon Accord, AB  
3223 N First Avenue  
Tucson, Arizona USA  
85719

To Whom It May Concern,

Please accept this letter as an indication of our support of the application being submitted by the Town of Bon Accord to gain the valued designation as a Dark Sky Community.

As a vested business and cultural partner with the Town of Bon Accord on numerous ventures designed to enhance and support the ever-growing rural lifestyle, this new initiative is a welcomed addition to this overall objective.

As an entertainment and educational facility that educates our guests on the benefits of a healthy and natural environment including all local flora and fauna, the preservation of a starry sky as a valued natural resource is very topical and appropriate for us and our community.

We wholeheartedly support the Town of Bon Accord and their endeavours to enhance the lives of the people that have the pleasure of calling Bon Accord their home.

Sincerely

Greg Suess  
General Manager



February 2, 2015

International Dark-Sky Association  
c/o Town of Bon Accord  
3223 N First Avenue  
Tuscon, Arizona 85719  
USA

Dear Dark Sky Places Committee:

As Mayor of the Town of Morinville, I am pleased to submit a letter of support as part of Bon Accord's application process to become an International Dark Sky Community.

Through initiatives such as the Summer Skies Equinox, it is evident that Bon Accord recognizes the importance of the night sky as a natural resource. Having attended past events, I can say that residents of the town and neighboring communities come together to unite by way of culture, education and environment.

We acknowledge and would like to thank Bon Accord for the work they do in their town and surrounding region to enhance the quality of life for residents. I urge the International Dark-Sky Association to recognize and reward the efforts of Bon Accord in improving the night sky by reducing light pollution and sky glow.

Sincerely,

Lisa Holmes  
Mayor

*An Alberta Capital Region Community*

10125 - 100th Avenue, Morinville, Alberta, T8R 1L6 Tel (780) 939-4361 Fax (780) 939-5633

Email: [mayor@morinville.ca](mailto:mayor@morinville.ca) Web: [www.morinville.ca](http://www.morinville.ca)



March 4, 2015

International Dark-Sky Association  
Dark Sky Places Committee  
3223 N First Avenue  
Tucson, Arizona 85719

**RE: Town of Bon Accord Dark Skies Designation**

Dear Dark Sky Places Committee:

I am writing on behalf of Municipal Planning Services (2009) Ltd. to express our organization's full and sincere support for the Town of Bon Accord's efforts to achieve designation as a Dark Sky community.

The Town of Bon Accord is taking great strides to improve the quality of life of its residents by limiting light pollution. Through thoughtful policies that support light efficiency and sensitive development, the Town is working hard to protect the night skies for its residents, neighbours and visitors. Bon Accord's leaders recognize the importance of reducing light pollution, and continue to work toward the dual goals of conservation and education.

As a professional community planning firm, we work with many communities across our region to create vibrant and resilient places for current and future residents to grow, thrive and enjoy a high quality of life. The Town of Bon Accord's efforts to reduce light pollution are a key feature of its development plans for future growth centred around dark sky protection, the enjoyment of our night skies and lifelong education. This concerted effort by the Town is exemplary in our region, and sets the Town of Bon Accord apart as a regional leader in sustainable development and light efficiency. I anticipate that the benefits of this effort will be seen for years to come, in higher quality of life for residents, increased local and regional understanding of the importance of reduced light pollution, and the general understanding that our night sky is a natural resource worthy of protection.

We at MPS commend the Town for their continued efforts to protect the night skies for education and enjoyment of current and future generations, and encourage the Committee to grant the Town of Bon Accord designation as a Dark Sky community.

Yours truly,

A handwritten signature in black ink, appearing to read 'J. Haney', written over a horizontal line.

James Haney, BA | MPlan | RPP | MCIP  
Community Planner  
Municipal Planning Services (2009) Ltd.

February 17, 2015

International Dark-Sky Association  
c/o Town of Bon Accord  
3223 N First Avenue  
Tucson, Arizona 85719  
USA

To whom it may concern:

As a faculty member in the Physical Sciences Department at MacEwan University and as past president of the Royal Astronomical Society of Canada (RASC) Edmonton Centre, I am writing to express my support of the town of Bon Accord in its bid to the International Dark-Sky Association to become an International Dark Sky Community.

It is well established by scientific research that reduced light trespass within a community improves the quality of life for all living inhabitants therein, and such a move by Bon Accord will surely foster the inherent curiosity of its children, as well as provide educational opportunities with events that support dark skies, provide star gazing opportunities and conservation efforts. Bon Accord is located a short 40 km north of downtown Edmonton, and the city of Edmonton, which has its own dark sky initiatives, is sure to take notice of Bon Accord's move to become an International Dark Sky Community and support its dark sky endeavours. Moreover, the RASC Edmonton Centre has itself actively pursued the preservation of dark skies by helping to create and celebrate the Beaver Hills Dark Sky Preserve and Jasper Dark Sky Preserve, as well as by forging a partnership with like-minded community groups which successfully lobbied the City of Edmonton to adopt a Light Efficient Community Policy. The RASC fully supports Bon Accord's initiative to attain formal recognition and protection of dark skies and the nocturnal environment.

MacEwan University is one of the primary post-secondary destinations for graduating high school students from Bon Accord. Arriving at MacEwan with a sense of curiosity of the night sky, and the environment in general, will be of substantial benefit to these students and to the University. As part of its core commitment and mandate, the University is committed to creative approaches to sustainability in education and campus operations, with a view to activating solutions for positive environmental, social, and economic impact. Moreover, the University's namesake, Dr. Grant MacEwan, was ahead of his time in terms of his interest and passion for sustainability, and this runs through the University's Departments, connecting Departments such as Physical Sciences to issues of global responsibility and environmental stewardship. Preserving the night for generations to come has the strong support of the Department of Physical Sciences, just as it would undoubtedly have had the support of Dr. Grant MacEwan.

I enthusiastically support the efforts of the town of Bon Accord as the community seeks to become a Dark Sky Community. Any programs that can help our children make better custodians of our environment will have benefits that ripple through their own and neighbouring communities.



Orla Aaquist

Dr. Orla Aaquist  
Physical Sciences Department  
Grant MacEwan University  
Edmonton, AB, Canada. T5J 4S2  
Phone: (780) 497-5788  
email: [aaquisto@macewan.ca](mailto:aaquisto@macewan.ca)

Pottery by Heather  
Box 214  
Bon Accord, AB

[info@potterybyheather.com](mailto:info@potterybyheather.com)  
[www.PotteryByHeather.com](http://www.PotteryByHeather.com)

January 31, 2015

International Dark Sky Association  
3223 N First Avenue  
Tucson, Arizona USA  
85719

To Whom it May Concern:

I am the owner/operator of a tourism based business in the Town of Bon Accord. I am in full support of the Town of Bon Accords application to become an International Dark Sky Community.

Our pottery studio draws tourists and customer base from the greater Edmonton region. This initiative will add another dimension bringing tourism focused on the natural history of the area. We know that any educational opportunities unlocked by community events supporting dark skies will benefit our business with increased tourism traffic. We have in the past and will continue to partner with the Town of Bon Accord in their night sky events.

As well as being business owners in the Town of Bon Accord, we are also residents who are amateur astronomers and naturalists. We understand the issues behind light pollution and sky glow and strongly back any initiatives that will help retain a quality environment for the local wildlife, and on a self serving level... a dark sky for star viewing. The night sky is a natural resource that should not be taken lightly.

We want to thank you for your consideration of this application.

Yours truly,



Heather Edwards  
Owner  
Pottery by Heather



Tam Andersen  
Director of Fun  
56311 Lily Lake Road,  
Sturgeon County  
P.O. Box 119  
Bon Accord, AB T0A 0K0  
P: 780.921.2272  
F: 780.921.2398  
E: [info@prairiegardens.org](mailto:info@prairiegardens.org)  
[www.PrairieGardensAdventureFarm.com](http://www.PrairieGardensAdventureFarm.com)

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March 9, 2015

International Dark Sky Association  
c/o Town Of Bon Accord, AB  
3223 N First Avenue  
Tucson, Arizona USA 85719

To Whom It May Concern,

Please accept this letter as an indication of our support of the application being submitted by the Town of Bon Accord to gain the valued designation as a Dark Sky Community.

We are a local agri-tourism business located just one km from Bon Accord. We offer many youth and adult educational programs, in partnership with the Town of Bon Accord, designed to connect youth and adults with nature, healthy living, and rural lifestyles.

The Bon Accord Dark Sky and Starry Sky initiative is a welcomed addition to this overall objective.

As a local farm we take great pride in bridging the urban-rural disconnect by inviting families to visit our farm. Each year, over 50,000 guests travel from the metro area of Edmonton to Bon Accord to explore the countryside.

We offer night-time adventures in the Corn Maze, where experiencing the stars is a thrill for visitors. We believe the benefits of a healthy and natural environment and the preservation of a starry sky as a valued natural resource is very appropriate for us, our community and the guests that visit our farm.

We wholeheartedly support the Town of Bon Accord and their endeavours to enhance the lives of the people that have the pleasure of calling Bon Accord their home.

Yours truly,

Tam Andersen  
Owner  
Prairie Gardens & Adventure Farm



**Travel Alberta**  
Suite 1900, 8215 112 Street  
Edmonton, Alberta  
Canada T6G 2C8

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🌐 [industry.travelalberta.com](http://industry.travelalberta.com)

January 19, 2015

Patrick Earl  
Economic Development Manager  
Town of Bon Accord  
5025 50 Avenue  
Bon Accord, AB  
T0A 0K0

Dear Patrick:

Please accept this letter as an indication of Travel Alberta's support for Bon Accord's initiative to seek recognition as an International Dark Sky destination. One of the major challenges faced by the tourism industry in Alberta is the development of new product that would be of interest to Albertans and visitors to Alberta from worldwide destinations. The International Dark Sky Designation would be a significant step forward to encourage related product development.

Bon Accord is an amazing community with a strong vision and a committed council and administration; Travel Alberta is proud to offer our support as you seek International Dark Sky Designation.

If have any questions or concerns please do not hesitate to contact me.

Sincerely,

Wynn McLean  
Vice President, Community Relations  
Travel Alberta  
780.679.6770

International Dark –Sky Association  
c/o Town of Bon Accord  
3223 N First Avenue  
Tuscon, Arizona 85719  
USA

February 25, 2015

Dear International Dark Sky Associates,

It is my pleasure to write a letter in support of the Town Bon Accord's commitment to dark skies and becoming a recognized International Dark Sky Community.

The University Of Alberta School Of Business, Executive Education, is a proud supporter in sustaining our environment and understands that light pollution is becoming an increasing issue as our communities continue to expand and our economical demands for light increase. We wish to ensure that the beauty of Alberta's dark skies is conserved to enhance quality of life and raise awareness for conservation efforts through education. Becoming a Dark Sky community will help foster curiosity and create educational opportunities for children of the future. I do not believe there is any other community in Alberta that appreciates and celebrates the beauty of our sky at night as the Town of Bon Accord. They have taken the initiative for the rest of Alberta in embracing this often underappreciated phenomenon with an annual Summer Skies Equinox event that celebrates culture, the environment, and education.

The University values the importance of this initiative for Bon Accord and will continue to support their efforts in receiving an International Dark Sky designation and their efforts for the future.

Sincerely,



Heather Christensen

## Bon Accord & District Agricultural Society

Box 57 Bon Accord, AB T0A 0K0

Corporate Access #5914284749

January 13, 2015

**Re: International Dark Sky Community Designation for Town of Bon Accord, AB**

To whom it may concern:

The Bon Accord & District Agricultural Society fully endorses The Town of Bon Accord and its application with the International Dark Sky Association on becoming the first International Dark Sky Community in Canada. The Town has made tremendous attempts in awareness, lighting retrofits and policy through governance, events, educational outreach, budgeting, municipal infrastructure and as a responsible business attraction strategy towards this designation.

As an Agricultural Society here in the Province of Alberta, we understand the importance of limiting the environmental impact of light pollution, and recognize the appreciation of a pristine rural night sky as a major benefit of a farming lifestyle.

Yours truly,



Hugh Allen, President  
Bon Accord & District Agricultural Society

## Public and Media Relations

Since Bon Accord embarked on this niche brand 3 years ago, media has been interested in the strategy and development of the tourism and community development of the Town.

Public awareness on the campaign to educate on light pollution abatement and promote dark sky tourism experiences has continued to grow year over year. Whether it is interest in the observatory park, bylaw and policy development or the Equinox festival, media exposure has crossed all forms of traditional and new media across the province.

As well, Town Administration have engaged in ongoing outreach to elementary school classes to discuss dark skies in the context of Alberta curriculum regarding sky science. Presentations have been made in each of the last three years by the Edmonton Centre chapter of the Royal Astronomical Society of Canada and Town Administration covering planets, comets and movement of stars and their relation to night sky. Administration has committed to ongoing presentations with no foreseeable end date.

A brochure for residents about dark-sky friendly lighting is being planned and will be available to residents and businesses at the Town Office and real estate offices.

View our mobile site (<http://m.stalbertgazette.com>)

# St. Albert Gazette

## Bon Accord changes brand

By: Scott Hayes

| Posted: Wednesday, Sep 26, 2012 08:00 am

Bon Accord put on a party last weekend with a marathon 30-hour cultural event held to coincide with the autumnal equinox. At the same time it made a major civic announcement that shed much light on the town's rebranding strategy, a strategy that has utter darkness as its end goal.

The town of 1,500 has recently embarked on a campaign to boost tourist numbers, and it has set its sights on the stars to guide all the visitors in.

"The Summer Skies Equinox festival is actually an event that helped to promote our new focus, and our new brand ... education, environment and culture," explained Vicki Zinyk, Bon Accord's chief administrative officer. "We tried to format an event that actually helped to promote that message."

The festival started at 6 p.m. on Friday and featured five different cultural storytelling tours of the night sky. There was a pig roast and fireworks too, but the main act was centre stage above everyone's heads in Alberta's famous big skies.

Recently, the town approved a policy to establish it as a community that incorporates responsible lighting throughout its streets, facilities and parks. This policy essentially branded the town as a Light Efficient Community as guided by the International Dark Sky Association, among other engineering and energy use associations. This association is the same group that governs what areas can be called Dark Sky areas or not.

"Bon Accord has been in existence for over 100 years and we essentially went away from our brand or cultural roots which is Scottish in nature. We have existed 'faceless' but now we want to try and resurrect some sort of commitment and interest in our town, and help promote growth."

That growth, she elaborated, is in new residents and in commerce, not in industry. The town wants to prove that its growth strategy is prudent, responsible, intelligent and inclusive for people of all cultures.

The town is currently in the process of applying to become a Dark Sky Community. So far, it has spent almost \$800,000 to replace some old lighting with dark sky friendly lighting, and to undertake some cosmetic changes to signage as well. The new lights feature full cutoff, meaning they are shielded above and none of the lights project upward into the sky beyond.

"That's what we want anyway. All of our existing lights will be retrofitted over a five-to-seven-year time frame. If we have more funds available sooner, then we will expedite that. New developments will all have the requirement to put in dark sky friendly lighting and use environmental initiatives whenever possible."

Bon Accord is located 34 km northeast of St. Albert on Highway 28.

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Vol. 17 No. 04T Morinville-Gibbons, Alberta December 3, 2013

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## Multi-family units propel home starts beyond 2012 rate

Single Family Housing starts in Morinville are down from 2012, however the total housing starts has far surpassed the total of a year ago based on the strength of the multi-family projects.

"Based on the population forecasts in the MDP (Municipal Development Plan), the desired growth rate for 2013 is documented to be 73 housing starts (single family and multi-family starts combined). The 3rd quarter report for 2013 indicates that Morinville has surpassed the desirable and healthy growth rate due to the construction of a 37 unit apartment building," administration advised Morinville Town Council on Nov. 26.

total of 95 housing starts, compared to 73 in 2012. This includes 35 single-family housing starts (compared to 57 in 2012) with a construction value of approximately \$9.0 million and 60 multi-family housing starts (compared to 16 in 2012) with a construction value of approximately \$8.2 million.

There were eight non-residential construction projects valued at approximately \$1,885,000 started. That's approximately \$719,000 less than in 2012, administration stated.

In the first three quarters of the year 195 development permits were issued, compared to 228 in 2012.



Members of Bon Accord Town Council stand beside a model of Observatory Park that was unveiled on the evening of Nov. 26 during an open house in the Town Office. (L-R): Councillor David Hutton, Deputy Mayor Alex MacKenzie, Councillor Lorna Pocock, Councillor Greg Mosyehuk and Mayor Randy Boyd. Story page A3. -photo by Grant Cree

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Emma Crevier and Natasha Brown grade four get some help to load the box of food collected at Morinville Public Elementary School from Town of Morinville employee Melodie Steele on Nov. 28 at 9:45 a.m. The annual Fill-A-Bus campaign to stock the Morinville Food Bank received some much needed donations from schools and businesses throughout town. Steele is the organizer of the annual event. -photo by Dolly Bolen

Box 3005, 10126 - 100 Ave. Morinville, AB T8R 1R9  
Ph: 780-939-3309  
Fax: 780-939-3093

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**ADVERTISING DEADLINES**  
Monday 2 p.m. for Friday edition  
Thursday 2 p.m. for Tuesday edition

## Stellar idea aims to boost Bon Accord's profile Town proposes observatory/library/business incubator

BY DAN BARNES, EDMONTON JOURNAL DECEMBER 13, 2013



Supplied

The tiny town of Bon Accord is reaching for the stars with a proposed observatory/library/business incubator project intended to drive residential and commercial development around its outer edges.

It's the brainchild of the town's economic development manager Patrick Earl, who is an amateur astronomer. If the walkable, town-square concept captures the imagination of developers, Bon Accord could build up its profile, population, commercial tax base and tourism potential.

On the other hand, the fanciful plan and the \$30,000 that the town has budgeted in 2014 for initial engineering could disappear, as if swallowed by a black hole, if it does not attract private investment.

"We want to be a unique destination," said Mayor Randolph Boyd. "We wanted to make sure we are not the same as our neighbours."

Bon Accord is about 35 kilometres north of Edmonton, located near Gibbons.

## Business in Bon Accord Gearing Towards Tourism

**BON ACCORD, AB (December 13, 2013)** – Retailers in the Town of Bon Accord recently received a boost in their marketing and customer service skills thanks to a pilot program launched by the Edmonton Regional Tourism Group (ERTG). The Recommended Retailer Program explores new marketing opportunities, networking, cost effective promotion strategies, and the highly valuable practice of teaming with other local businesses to provide ‘experience packages’ for customers.

Twenty-five per cent of store front businesses, a home-based business and Town staff took part in the Recommended Retailer Program, a spin off from another very successful course for tourism operators offered by the ERTG throughout the Capital Region since 2008. Connecting local business operators and honing their skills ultimately helps ensure a positive memorable experience for customers.

Local business owners who completed the program, like Kathy Hutton from Petals n’ Possibilities, has already achieved success from applying the learning and strategies. Similarly, Lilypad Lane owner Gayle Boyd valued the interaction with other business owners and felt “energized and very excited about the changes I could make in my business.”

“Every point of contact for a visitor factors in to that visitor’s overall experience when they visit Bon Accord,” explains Patrick Earl, Economic Development Manager for Bon Accord. “The pilot program inspires businesses to see that they are part of the big picture in strengthening the Town’s positive reputation and building tourism in Bon Accord, which is a major economic development focus for the Town.”

Bon Accord has been rapidly moving towards a tourism focus over the past two years to attract growth to the Town. Currently working on an international dark sky designation and development of a multi-use observatory park, the Town is hoping to enhance the tourism sector in a unique way and encourages local businesses to leverage the resulting opportunities.

“We’ve been building upon a number of successes in the tourism sector recently, including our highway frontage and community enhancement strategies,” says Vicki Zinyk, CAO for the Town of Bon Accord. “We are really emerging as a destination for day trips with events like our award-winning Summer Skies Equinox, which showcases where we are headed as a municipality. It is a very exciting time for our community.”

The ERTG will be rolling out the full retail program to other municipalities in the Capital Region in 2014. For more information, contact Alexis Nelson with the ERTG at [anelson@edmontonscountryside.com](mailto:anelson@edmontonscountryside.com).

For more information about Bon Accord and its economic development and tourism initiatives, contact Patrick Earl, Economic Development Manager, Town of Bon Accord at 780-921-3550 or [pkearl@bonaccord.ca](mailto:pkearl@bonaccord.ca).

## Bon Accord Advances World Class Observatory Park Concept

**BON ACCORD, AB (December 17, 2013)** – Bon Accord’s economic development strategy leapt forward recently with the unveiling of the Town’s Observatory Park Concept. The initial design concept includes a five acre public park space with a world class observatory housed in a multi-use facility. Town Council and Administration believe Observatory Park will create a tourism niche for Bon Accord and foster much needed commercial and residential development in the community.

“Bon Accord has made significant progress on our economic development strategy throughout the past year, including growth of events like our award winning annual Summer Skies Equinox. Town Council is very excited about the Observatory Park concept and the realm of unique development opportunities that it could bring,” explained Mayor Randolph Boyd. “Support from the community at the public unveiling of the concept was phenomenal and shows that Bon Accord’s residents and businesses want to be engaged as the project advances.”

The Observatory Park Concept is currently in design stage. A replica model depicts the layout of the five acre park which includes storefront commercial with upper floor residential units, parking around the outer perimeter of the Park area to promote a walkable community, and designated recreational vehicle parking to support tourism. The multi-use facility itself is slated to house a relocation of the existing library and develop a business incubator to help stimulate small business growth in the community. Office space and resources would be shared among small business start-ups to assist them until profitable and able to move to an independent retail location, potentially within the commercial space designated in Observatory Park.

Perhaps the most unique feature of the concept is the fully automated 17 inch high powered telescope. It will be a valuable tool for education, public events, and research. Observatory Park and its telescope builds upon Bon Accord’s Light Efficient Community Policy and Dark Sky Designation endeavors. The Town is seeking to be the first in Canada to achieve an International Dark Sky Community Designation, and the Park’s design would help showcase that residential and commercial development can exist within a dark sky area.

“The timeline for the project is dependent on several items, including community feedback as well as solidifying partnerships with various levels of government, Telus World of Science, and research institutions like the University of Alberta,” commented Vicki Zinyk, CAO for the Town of Bon Accord. “Assuming these items progress smoothly, we are aiming for completion within three to five years.”

Bon Accord Town Council has approved proceeding with an engineering study for the Park concept in 2014. The Economic Development Department is currently seeking developers to become involved in the project. Highlights of Observatory Park can be found at [www.bonaccord.ca](http://www.bonaccord.ca).

For more information about Bon Accord and its economic development and tourism initiatives, contact Patrick Earl, Economic Development Manager, Town of Bon Accord at 780-921-3550 or [pkearl@bonaccord.ca](mailto:pkearl@bonaccord.ca).

## Recent online publicity links:

**March 6, 2015:**

### **First reading of Light Efficient Community Standards Bylaw receives regional recognition**

The Morinville Free Press serves a vibrant mix of suburban, town, agriculture, and industrial sectors. Its circulation area covers Morinville, Gibbons, Legal, Bon Accord, and the hamlets and subdivisions which make up Sturgeon County. The Free Press picked up the press release issued by Administration after the Light Efficient Community Standards bylaw received first reading, allowing those throughout Sturgeon County to appreciate the efforts undertaken by Bon Accord.

<http://morinvillemews.com/2015/03/06/bon-accord-bylaw-seeks-to-reduce-light-pollution/>

**March 8, 2015:**

### **First reading of Light Efficient Community Standards bylaw gets Province wide publicity**

Edmonton's most listened to radio station is the local news/talk/sports radio hailing over the broadcast airwaves on AM 630 was one of the first to reach out to the Town after the Light Efficient Community Standards bylaw passed first reading. This article interviews Acting CAO and Economic Development Manager Patrick Earl regarding the efforts of Administration and what the Town hopes to achieve. A similar interview was also done with AM630 sister station in Calgary, QR77, the day prior.

<http://www.630ched.com/?s=bon+accord&x=0&y=0>

**March 10, 2015:**

### **Article by Global News regarding Bon Accord's Dark Sky initiatives**

Global News is one of the major networks in Canada and was interested in covering and adding to the increased buzz around Edmonton about the small community that could. As with previous articles, this one features an interview with Acting CAO Patrick Earl as well as research done by the reporter regarding the International Dark-Sky Association and the designation offered. The reporter notes that Bon Accord would be the first community in Canada to receive this designation, something that has driven our process, the desire to be a leader.

<http://globalnews.ca/news/1873796/turn-out-the-lights-bon-accord-seeking-dark-sky-designation/>

**March 12, 2015:**

### **Interview of Acting Chief Administrative Officer Patrick Earl on CTV Primetime**

In this television interview with CTV2 Primetime host Shawna Randolph, Acting CAO Patrick Earl explains to viewers the efforts the Town is taking to meet the requirements of the International Dark-Sky Association for the designation. This publicity raises the Town's profile in addition to informing viewers about some actions they can take to reduce light pollution in their own community.

<http://alberta.ctvnews.ca/video?clipId=569463>

# The Projects

Ten projects have been identified by the Town and are either already complete or are underway.

## Light Efficiency Community Standards Bylaw

Every community has its share of policies and bylaws which form the backbone of the vision Administration and Council have. Over time those priorities shift as society changes and moves forward. In 2012, Administration drafted and Council unanimously passed Bon Accord's first Light Efficient Community (LEC 2012) Policy. The LEC 2012 Policy expressed the statement "that the Town of Bon Accord will be a Light Efficient Community through application of design, technology and practices used for lighting public and private spaces as guided by the International Dark-Sky Association (IDA), the Illuminating Engineering Society of North America (IESNA), and the transportation Association of Canada (TAC), regarding the design, installation, and operation of light sources." This statement, while encompassing the vision of the Town is short of steps for implementation. Nevertheless, some projects were completed under this LEC 2012 and set the Town on the path to look at lighting critically when retrofits or repairs were required.

As the Town embarked on initial projects under the LEC 2012 it became apparent that while the LEC 2012 was a good starting place, it lacked the detail and guidance required for more complex uses. To address these concerns the Town developed an updated and revised Light Efficient Community Policy (LEC 2015) as well as a Light Efficient Community Standards Bylaw (LECS 2015) in order to enable enforcement of the Town's vision towards dark skies. The LEC 2015 and LECS 2015 incorporate the goals restrictions outlined in the Model Lighting Ordinance published by the IDA, and reflect the realization of the Town that in order to ensure dark skies for generations to come a more complex and detailed approach had to be taken. Council enthusiastically endorses the vision of these documents and is confident they will ensure the Town maintains its unique rural opportunities and the sky remains starry over Bon Accord.

Major aspects of the Bylaw will also reside substantially throughout the Town's Municipal Development Plan (Vision document), Land Use Bylaw (related to commercial signage guidelines and respect of adjacent residential properties) and Tourism Strategy.

## Water Fill Station

One of the most ubiquitous buildings in rural Canada may be water filling stations. Residents from the community and surrounding areas are able to use the fill station to fill cisterns on their property and provide their families with potable water. Using a card lock system means the station is available to residents 24 hours a day. Like other buildings which require 24/7 lighting, uncontrolled and unshielded lighting is a major source of light pollution and light trespass in any community.

Identified as a project which the Town could use to demonstrate a reduction in light pollution, Administration applied for a FortisAlberta “Energy Your Way Earth Hour Challenge Grant,” in 2015.

Upon receipt of funding Bon Accord Public Works will install the Hubbell LNC-5LU luminaires at the fill station as are installed on the Town Office. Public Works, in consultation with Administration, that Administration has made the decision that regardless of if the grant application is successful or not, the retrofit will move forward and a major source of uncontrolled light will be eliminated through efforts of the Town.

## Town Office Lighting

As a rule, Town Offices in rural communities serve as more than a mere administration building. Bon Accord is no different. The Town Office houses the Fire Hall, Library, Preschool, and home to Bon Accord’s summer programming, as well as Council Chambers and Administration offices. As anyone who has driven through a small town, or even a large town knows, one of the most irritating sources of light pollution are unshielded wall packs. A source of cheap and easily installed lighting widely installed on many public buildings installed with abandon in the 1970s and 1980s, these wall packs give off a glare which is distracting to drivers. They cannot be adjusted directionally and are poor choices for any outdoor lighting use. Initially installed when the Town office was modularly built between the 60s to the 90s, the unshielded wall packs accounted for significant amounts of light pollution and glare have been replaced.

This replacement of the wall packs with Hubbell LNC-5LU luminaires took place in 2014 through a Community Naturalization Grant from FortisAlberta as one of the first initiatives under the original Light Efficient Community Policy. According to the manufacturer, these replacement Hubbell LNC-5LU luminaires emit 980 lumens, and are full cut-off luminaires, which solves a significant light pollution issue, and encourages better efficiency issues in the Town.

## Street Lighting Retrofit

In 2012 Bon Accord began looking at and examining the issue of lighting in Town. As an initiative under the newly drafted Light Efficient Community (LEC 2012) Policy, Council and Administration sought to tackle the biggest source of light pollution, sky glow, and light trespass; street lighting. By working with FortisAlberta, one of Alberta's premier providers of electricity and lighting services, Bon Accord was able to develop a strategy to retrofit all of the existing luminaires providing street lighting in the Town. The retrofitted luminaires transitioned the existing 100 W high pressure sodium lamps emitting 9500 lumens each to 66 W LED full cut off luminaires with a CCT of less than 3300K.

While maintaining public safety and reducing actual lighting levels, the Town did not add any additional poles to the network. Quoting from the Fortis Alberta Street Lighting Catalogue, the luminaire chosen by the Town "is ideal for roadways where cutoff optics is preferred or light trespass is an issue...the cutoff optics of the Flat Glass Cobra Head luminaire reduces the light trespassing onto abutting properties and into the sky...has an electronic photo-control which automatically turns the lamp on and off based on outside lighting levels."

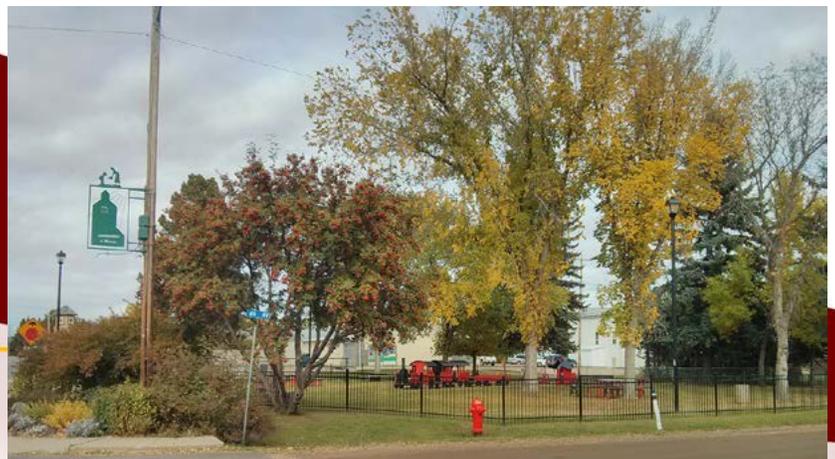
By September 19, 2015, all 220 luminaires will be replaced, offering a significant reduction in ambient nighttime lighting, and sky glow, while also reducing energy usage and saving money on lighting in Town.

Discussions are currently ongoing with FortisAlberta to finalise the details of this retrofit.

## Centennial Park Lighting

Centennial Park, or as it's known by many of the locals, the Train Park, is a small park located near the heart of Bon Accord. Known as the Train Park due to the train themed activities and equipment in the park, this is one of Bon Accord's most utilized parks. A cute little red train is stationed at the park, and the park has played host to great wedding photos, family reunions and host to many community events. Each summer the public works team places picnic tables for families and groups to enjoy Alberta's long sunny days.

Due to a contractor error, the pole heads installed by FortisAlberta were not the correct Dark Sky friendly and FortisAlberta is replacing them at their cost. This replacement is expected to complete by the summer of 2015. This project was completed under the LEC 2012.



# Digital Commercial Sign

Part of the allure of the prairies of Alberta are the endless highways and charming communities. Each community along the highway has its own unique offering to the endless miles of highway which make up the fabric of Alberta. If they're lucky enough, a community has the opportunity to broadcast to those passing by on the road. A 4' by 8' doubled sided LED sign with highway frontage was recently approved by the Alberta Transportation (the body in charge of permitting on all provincial highways) and Planning & Development Coordinator.

This sign projects in colour during the day, while converting to exclusively red and black colours at night. Additionally, the sign will not display any animations, either during the day or night. All advertisements displayed on the sign are designed by the Town to ensure compliance with the Town's Light Efficient Community Policy 2015, Light Efficient Community Standards 2015 bylaw and is a test application for Alberta Transportation permitting.

Without the conditions set by the Town in its policy and bylaw, the permit from Alberta Transportation would not have been approved. Our conditions of the permit are now being considered by other rural communities in the province looking for highway digital signage. We have included scans of the permit from Alberta Transportation on the next few pages..





September 8, 2014

File No.: 368-03

Terry Sonmor  
Assistant D/P Tech  
Operations – Stony Plain  
Transportation  
2<sup>nd</sup> fl Provincial Building  
4709 – 44 Avenue  
Stony Plain, AB T7Z 1N4

RECEIVED  
SEP 12 2014

Dear Mr. Sonmor:

**RE: Town of Bon Accord Electronic Graphic Display Sign – Alberta Transportation File No. 1545-1/28**

The Town of Bon Accord is resubmitting its application for an Electronic Graphic Display Sign (EGDS) as a follow-up to the Town's meeting with Mr. Neal Reynolds on August 14, 2014.

The Electronic Graphic Display Sign will be situated as indicated in the enclosed site plan and will maintain a 7m setback from the edge of the existing highway right-of-way to the closest edge of the EGDS, which equates to 16m from the centreline of Hwy. 28. The 1.22 m x 2.36 m sign will be placed atop a single post bringing the total height of the EGDS to 6.1 m from grade. Placement of the EGDS at this height and on a single pole will minimize any impacts on sightlines and visibility at the 51<sup>st</sup> Street and Hwy. 28 intersection.

The sign is to be solely owned and operated by the Town of Bon Accord, but will be situated on land owned by Alberta Spirits and Suds Ltd. The Town of Bon Accord and Alberta Spirits and Suds Ltd. have entered into a lease arrangement for placement of the EGDS. All advertising to be placed on the EGDS will be completed in house by Town of Bon Accord staff.

The EGDS will be subject to the Town of Bon Accord's Light Efficient Community Policy (see enclosed), with the Town making every reasonable effort to control night time lighting levels by limiting messaging to shades of red at night. During daytime hours regular lighting and colour schemes would apply, with no white backgrounds being used in any of the advertising. It should be noted that all ads displayed on the EGDS will do so for 30 seconds (at minimum) with transitions between ads being partially animated, i.e. card flip animation. There are to be no animations as part of the ads themselves, these are to be static in nature.

Should you have any questions regarding the details of our resubmission of the application for sign installation near a provincial highway, please feel free to contact me at the phone number or email address noted below.

Yours truly,

**Scheffer Andrew Ltd.**

Luis Esteves, BA  
Senior Planner

Direct: 780.732.7794, Cell: 780.886.8619  
Email: l.esteves@schefferandrew.com

Encl:

cc: Vicki Zinyk, CAO – Town of Bon Accord



# APPLICATION FOR SIGN INSTALLATION NEAR A PROVINCIAL HIGHWAY

Alberta Transportation Permit # \_\_\_\_\_

Applicant's Name Town of Bon Accord C/O Scheffer Andrew Ltd.

Mailing Address 12204 - 145 Street

City/Town/Village Edmonton Province Alberta Postal Code T5L 4V7

Phone # 780-732-7794 Fax # 780-732-7878 e-mail l.esteves@schefferandrew.com

Landowner's Name (if different from above) Alberta Spirits and Suds Ltd.

Mailing Address Box 94

City/Town/Village Thorhild Province Alberta Postal Code TOA 3J0

Phone # 780-921-3139 Fax # 780-921-3163 e-mail \_\_\_\_\_

APPLICATION IS HEREBY MADE TO INSTALL OR CHANGE A SIGN IN:

**Property Information**

(NE, NW, SE, SW) A	¼ Section	Township	Range	West of Meridian
		5251 BA	0.73 ha	
Lot	Block	Plan Number	Parcel size (acres or hectares)	
28	7 m		Various Businesses	
Highway No.	Distance of the proposed sign to the highway boundary	Location of business shown on sign		
Town of Bon Accord	Commercial - Highway	\$74,999		
Name of Municipality	Existing / Proposed Land Use	Estimated cost of proposed sign		
Dimensions of sign "face":	Length <u>7'9"</u>	Height <u>4'</u>		
Sign Type (select one):	One Sided _____	Double Sided <u>Electronic</u>		
Purpose of Sign:	Business Identification <u>Yes</u>	Directional _____	Construction _____	
	Other (explain) <u>The electronic sign, will act to identify local businesses as well as highlight local Town Initiatives.</u>			

Note: Please attach a plan showing the proposed sign in detail including the wording, etc. and the location of the proposed sign and existing as well as proposed development relative to the ¼ line and highway. Location of items such as existing or proposed shelterbelts, signs, etc. must also be shown.

It is understood that all works will be constructed, altered, maintained or operated at the sole expense of the undersigned, and that any work must not begin before a permit has been issued by Alberta Transportation. The issuance of a permit by Alberta Transportation does not relieve the holder of the responsibility of complying with relevant municipal bylaws and this permit once issued does not excuse violation of any regulation, bylaw or act which may affect this project.

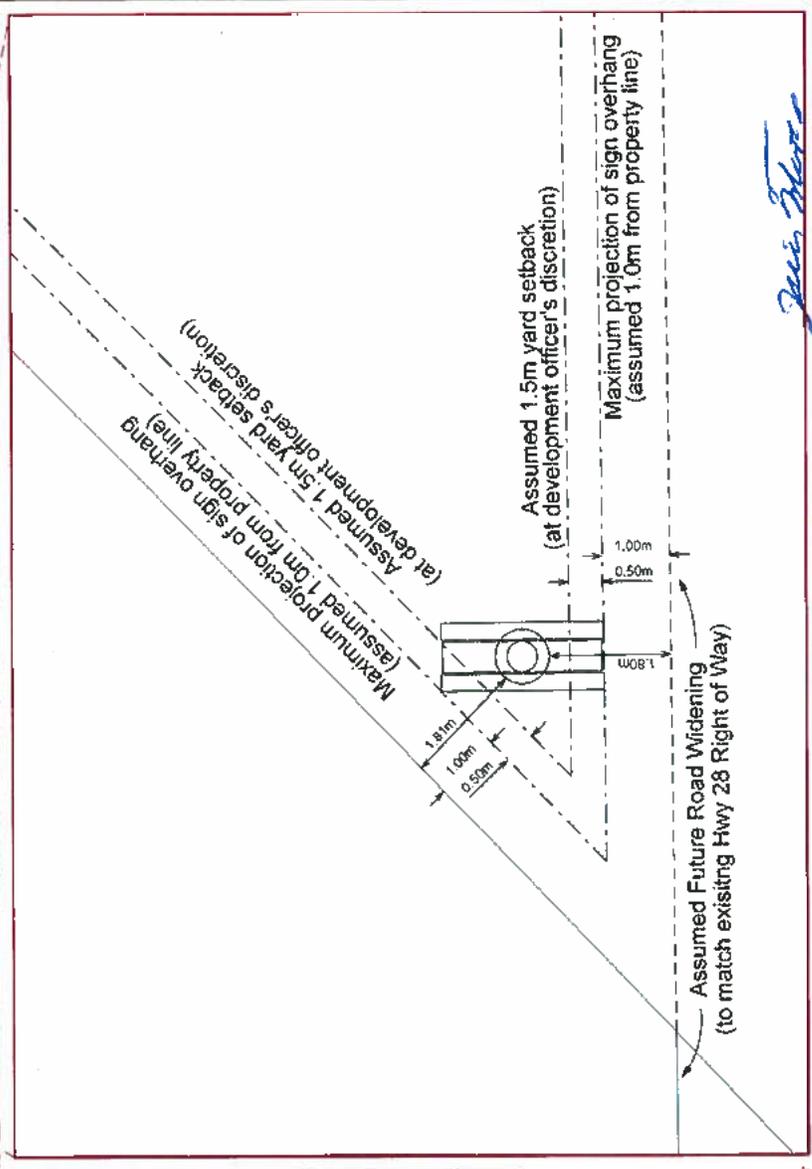
In consideration of any permit issued in respect to this application, the Applicant shall indemnify and hold harmless Alberta Transportation, its employees and agents from any and all claims, demands, actions and costs whatsoever that may arise, directly or indirectly from anything done or omitted to be done in the construction, maintenance, alteration or operation of the works authorized. The Applicant also consents to a person designated by Alberta Transportation to enter upon land for the purpose of inspection during the processing of this application.

I \_\_\_\_\_ hereby certify that  I am the registered owner \_\_\_\_\_  
(print full name) Signature

I Luis Esteves hereby certify that  I am authorized to act on the owner's behalf \_\_\_\_\_  
(print full name) Signature

and that the information given on this form is full and complete and is, to the best of my knowledge, a true statement of facts relating to this application for sign installation.

(Date) September 8, 2014



**FIGURE 1  
SIGN PLACEMENT**



*Juan M...*

## Arena Lighting

The prairies have their own unique idiosyncrasies, from oddly numbered streets to our fascination with being home to any object deemed to be the world's largest. One thing that does not stop at the prairies, but transcends the length and width of Canada is our love of hockey and the quintessential hockey rink in nearly every community across Canada. Bon Accord is no different, home to our regional hockey powerhouse, the CNN Spurs. Since arenas are a common sight in Canada, they obviously play a significant role in over lighting in Canada. Much like baseball diamonds or football fields in the United States, every community takes pride in their rink.

Administration has identified the arena, and the lighting around it, as a source of light pollution in the Town, with two 'farm' type lights, having open baffles and generally not succeeding in controlling light pollution. By moving the existing poles and adding full cut off Cobra head luminaires, Public Works is continuing its efforts to reduce light pollution and over lighting around one of the most public spaces in Town. In addition to replacing the overhead lights, Public Works is replacing the existing wall packs on the arena with similar Hubbell LNC-5LU luminaires used in other applications around the community. This retrofit is expected to be complete by the end of 2016, if not sooner. This project will be completed under the LEC 2015.

## Rose Garden Lighting

The Bon Accord Rose Garden is a quaint public garden maintained by the Communities in Bloom community group with funding support from the Town. The Bon Accord Rose Garden has never before been intentionally lit, and the Town is looking to change that to allow for the community and visitors to enjoy the park space during the twilight hours of the day and at night. Incorporating a walkway lighting strategy allows access and enjoyment of the park grounds at any time of the day or night, while not adding to existing light pollution and sky glow.

Design will ensure of any lighting installed is full cut off and does not contribute to over lighting in the Community. Ensuring installed luminaires gently light the pathways of the garden, while not contributing to sky glow is a primary concern to the Town. By limiting lighting generally, the Town ensures that this new lighting will contribute to the enjoyment of the Rose Garden, while not adversely affecting the indigenous fauna of the garden. Design will include plants and foliage which have been demonstrated to prevent up lighting in the area. Public works will be in consultation with Administration throughout the process of design and installation of lighting to ensure the requirements of the LECS 2015 are met.

## Communities in Bloom Sign

Communities in Bloom is a Canadian non-profit organization committed to fostering civic pride, environmental responsibility and beautification through community involvement and the challenge of a national program, with a focus on enhancing green spaces in communities. The Communities in Bloom organization has supported Bon Accord's efforts to become an International Dark-Sky Community and has provided a letter of support included earlier in this document.

A smaller sign than the Digital Commercial Sign, and is the Communities in Bloom sign just off the highway frontage. This 2' by 8' LED sign is designed to display only red and black colours. Located at the main entrance to Town, this sign dims to 30% of its original brightness with a photo-electric sensor which adjusts the brightness of the sign based on seasonal variation. The sign was installed to specifically inform the public about efforts to create a more green community, inform residents about events and other public information which may be important to the residents.

# Walking the Talk through Municipal Governance

Beyond the message of becoming a International Dark Sky Community, Bon Accord has either completed or planned to complete projects to retrofit existing lighting, develop policies and bylaws, and worked with the community and businesses to get their support and commitment to get to the goal of becoming a truly dark sky community.

The Town has one of the most comprehensive policies and bylaws (ordinances) in Canada. Bon Accord always strives to lead and support other communities who look to attain the same goals and build awareness of night sky preservation for energy conservation, health of residents and their local ecosystems, and an overall enhancement of quality of life.

The original Light Efficient Community Policy passed in 2012 was revised in 2015. Along with this came the Light Efficient Community Standards Bylaw which will now provide guidelines and enforcement options as the bylaw comes into full effect in 2023.

Both the policy and the bylaw are available on the Town's website ([bonaccord.ca](http://bonaccord.ca)) should they need to be reviewed on their own outside of this document.

## The Policy (LEC 2012)

Pg 64-67

## The Policy (LEC 2015)

Pg 68-76

## The Bylaw (LECS 2015)

Pg 77-110

These policies and bylaw have assisted the Town engaging and educating residents and other stakeholders. Additionally getting projects created and getting them into the municipal budget in the short and long term. The new Bylaw and Policy are included as an integral part of this document.

## Highlights of Policy and Bylaw addressing designation requirements for International Dark Sky Association

**The provisions of the updated Bon Accord Light Efficient Community Policy (2015) and Light Efficient Community Standards Bylaw (2015-07) which meet the requirement of the IDSC Guidelines can be found in the following locations...**

**“Fully-shielded or FCO for all fixtures over 3000 lumens initial lamp output”**

Can be found on page 6 of the LEC 2015 (page 73 of this document)

**“Restrictions on total amount of unshielded lighting, such as lumens per acre or total site lumens in unshielded fixtures (or equivalent wattages)”**

Can be found in Section 4 of the LECS Bylaw 2015 (page 84 and 85 of this document)

**“A policy to address over-lighting, such as energy density caps, lumens/acre caps, or maximum illuminance specifications”**

Can be found in Section 4 of the LECS Bylaw 2015 (page 85 of this document)

**“A provision that clearly indicates where, when, and under what circumstances new public outdoor lighting is warranted and will be permitted”**

Can be found in Section 3 and Section 4 of the LECS Bylaw 2015 (pages 83-85 of this document)

**“A provision that clearly requires that adaptive controls and curfews be employed in all future installations of public outdoor lighting”**

Can be found in Section 7 of the LECS Bylaw 2015 (pages 87 and 88 of this document)

## TOWN OF BON ACCORD POLICY STATEMENT

**SECTION:** *Planning & Development*

**POLICY NO.:** 12.29

**SUBJECT:** LIGHT EFFICIENT COMMUNITY

**RESPONSIBLE AUTHORITY:** Administration – Planning & Development

**REVIEWED & APPROVED BY COUNCIL:**

February 7, 2012 - Council Meeting-Resolution 12.29  
Repealed March 17, 2014

**PURPOSE AND INTENT:** To provide direction and commitment for the use of efficient and environmentally responsible lighting.

**POLICY STATEMENT:** The Town of Bon Accord will be a Light Efficient Community (LEC) through application of design, technology, and practices used for lighting public and private open spaces as guided by the International Dark-Sky Association (IDA), the Illuminating Engineering Society of North America (IESNA) and the Transportation Association of Canada (TAC) regarding design, installation and operation of light sources.

**DEFINITIONS:**

**“Light Efficient Community (LEC)”** means a community that uses lighting responsibly. It uses the most effective, efficient, artificial lighting available to minimize energy waste, glare, light trespass and light pollution and employs designs, measures, legislation and good lighting practices to reduce its energy costs and carbon footprint while preserving the natural environment, and ensuring health, safety and a high quality of life for all.

**“Light trespass”** means the shining of light produced by a luminary beyond the boundaries of the property on which it is located.

**PROCEDURE:**

All new and retrofitted public and private lighting infrastructures within the Town boundaries must reflect the needs and suitability of the proposed design in accordance with the International Dark Sky Association IDA, the Illuminating Engineering Society of North America

(IESNA) Guidelines and the Transportation Association of Canada (TAC) Guide for the Design of Roadway Lighting.

All luminaries lawfully in place prior to the adoption of this policy shall be grandfathered. In the case that grandfathered luminaries are to be moved, repaired, or replaced for any reason, the luminary shall then be required to meet the provisions set out in this policy.

This policy will be integrated into Town policies, standards, and regulations, which will address the specific needs of various stakeholders and will be coupled with educational programs on this topic for Town staff, residents, and businesses. These policies, standards, and regulations will respect the following principles:

- Lighting will be used where it is needed, when it is needed, and at levels suited to the task. In some cases, such as natural areas, this may mean that a total absence of lighting is encouraged.
- Lighting technology will be selected to address visibility needs in the most energy-efficient form that is practical.
- Luminaries will confine light to the area needing illumination.
- Light trespass onto adjoining properties will be minimized.
- Lighting that creates unsafe conditions or harmful glare will not be permitted.
- Adequate lighting must be provided on roadways and other similar public spaces in order to ensure public safety. The definition of adequate lighting will be guided by accepted engineering standards and principles of Crime Prevention Through Environmental Design (CPTED).
- Voluntary light curfews will be encouraged for all residential, commercial, recreation, and institutional users of exterior night time illumination.
- All types of outdoor lighting are subject to this policy, including but not limited to light for streets, trails, signs, walls and landscaping.

Special Note: Other policies, standards and regulations that may be affected by the LEC policy are the Engineering Servicing Standards and Land Use Bylaw.

### **ROLES AND RESPONSIBILITIES:**

The role of **Administration** is to:

1. Ensure alignment with the Strategic Plan and Integrated Community Sustainability Plan (ICSP).

The role of **Planning and Development** is to:

1. Update the Municipal Development Plan and Land Use Bylaw to reflect the principles of this policy;

2. Review all outdoor lighting plans in development projects;
3. Provide for certain intermittent activities, such as construction and holiday lighting, to be exempted from this policy and/or associated regulations;
4. Develop and implement plans to retrofit existing outdoor street lighting
5. Adopt new efficient light standards within the Engineering Servicing Standards applicable to all zones and land uses;

The role of **Operations** is to:

1. Update the lifecycle program to reflect the principles of this policy as it relates to outdoor facility lighting;
2. Replace non-conforming luminaries with conforming luminaries when upgrading outdoor facility lights; or any time major repair or replacement is required and
3. Introduce time-of-day controls for existing facility lighting so that lights are only lit when facilities are in use.
4. Develop and implement plans to replace non-conforming luminaries with conforming luminaries when upgrading street lights

The role of **Arena, Parks and Recreation** is to;

1. Update the Open Space and Recreation Facilities Strategy to reflect the principles of this policy and
2. Replace non-conforming luminaries with conforming luminaries when upgrading outdoor lights in public parks or trails, or any time major repair or replacement is required.

The role of Economic Development and Tourism is to:

1. Incorporate the principles of this policy into the Economic Development Strategy
2. Develop a communications plan to create awareness for the business community.

The role of Communications is to:

1. Develop a Communication Plan and education strategy to create awareness in the community that may include:
  - A Light Efficient Community public education program for Town staff and the community

- A website resource for responsible lighting information and links
- Community events to encourage public participation in becoming a Light Efficient Community
- Materials regarding responsible lighting practices and distribute to the entire community

**PROCEDURES:**

Further development of implementation plans of the above listed roles and responsibilities are required including, scheduling, budgeting, staff and resource allocation.

Repealed 17Mar15

# TOWN OF BON ACCORD POLICY STATEMENT

**SECTION:** Administration

**POLICY NO.:** 15.51

**SUBJECT:** LIGHT EFFICIENT COMMUNITY POLICY

**RESPONSIBLE AUTHORITY:** Administration Department

**REVIEWED & APPROVED BY COUNCIL:** February 17, 2015

**PURPOSE AND INTENT:**

To provide a framework for Council and a set of minimum standards for the adoption of a light use policy promoting efficient and environmentally responsible lighting in accordance with the Model Lighting Ordinance (MLO).

**POLICY STATEMENT:**

The Town of Bon Accord will adopt a lighting ordinance which achieves the minimum requirements of the Model Lighting Ordinance created by the International Dark-Sky Association (IDA), the Illuminating Engineering Society of North America (IES), and the Transportation Association of Canada (TAC). The Town is updating their Light Efficient Community Policy to facilitate an application to the International Dark-Sky Association for the designation of an IDA Dark Sky Community, the first such designation to be awarded in Canada.

**DEFINITIONS:**

1. **“Absolute photometry”** is a photometric measurement (usually of a solid-state luminaire) that directly measures the footprint of the luminaire. Reference Standard IES LM-79.
2. **“Astronomic Time Switch”** is an automatic lighting control device that switches outdoor lighting relative to time of solar day with time of year correction.
3. **“Backlight”** is a reference to an exterior luminaire, lumens emitted in the quarter sphere below horizontal and in the opposite direction of the intended orientation of the luminaire. For luminaires with symmetric distribution, backlight will be the same as front light.
4. **“BUG”** is luminaire classification system that classifies backlight (B), uplight (U) and glare (G).

5. **“Canopy”** is a covered, unconditioned structure with at least one side open for pedestrian and/or vehicular access. (An unconditioned structure is one that may be open to the elements and has no heat or air conditioning.)
6. **“Common Outdoor Areas”** One or more of the following: a parking lot; a parking structure or covered vehicular entrance; a common entrance or public space shared by all occupants of the domiciles.
7. **“Correlated Colour Temperature”** or CCT is a measure of light source color appearance defined by the proximity of the light source's chromaticity coordinates to the blackbody locus, as a single number rather than the two required to specify a chromaticity.
8. **“Development Officer”** is an official of Bon Accord appointed, according to the procedures authorized by Town Council, to act as a development authority according to the *Municipal Government Act*.
9. **“Emergency Conditions”** is lighting that is only energized during an emergency; lighting fed from a backup power source; or lighting for illuminating the path of egress solely during a fire or other emergency situation; or, lighting for security purposes used solely during an alarm.
10. **“Footcandle”** The unit of measure expressing the quantity of light received on a surface. One footcandle is the illuminance produced by a candle on a surface one foot square from a distance of one foot. One footcandle is equal to one lumen per square foot or approximately 10.76391 lux.
11. **“Forward Light”** For an exterior luminaire, lumens emitted in the quarter sphere below horizontal and in the direction of the intended orientation of the luminaire.
12. **“Fully Shielded Luminaire”** is a luminaire constructed and installed in such a manner that all light emitted by the luminaire, either directly from the lamp or a diffusing element, or indirectly by reflection or refraction from any part of the luminaire, is projected below the horizontal plane through the luminaire's lowest light-emitting part.
13. **“Glare”** is lighting entering the eye directly from luminaires or indirectly from reflective surfaces that causes visual discomfort or reduced visibility.
14. **“Hardscape”** is permanent landscape improvements to a site including parking lots, drives, entrances, curbs, ramps, stairs, steps, medians, walkways and non-vegetated landscaping that is three (3) metres or less in width. Materials may include concrete, asphalt, stone, gravel, etc.
15. **“Hardscape Area”** is the area measured in square metres of all hardscape. It is used to calculate the Total Site Lumen Limit in both the Prescriptive Method and Performance Methods. Refer to Hardscape definition.
16. **“Hardscape Perimeter”** is the perimeter measured in linear metres and is used to calculate the Total Site Lumen Limit in the Performance Method. Refer to Hardscape definition.

17. **“IDA”** is the International Dark-Sky Association.
18. **“IESNA”** is the Illuminating Engineering Society of North America.
19. **“Illuminance”** is the total luminous flux incident on a surface, per unit area. It is a measure of how much the incident light illuminates the surface, correlated with brightness perception.
20. **“Initial Lumens”** is the amount of light output from a lamp when it is new. For a metal halide lamp, these ratings are averages based on photometry at rated lamp watts after 100 hours of operation.
21. **Lamp** is a generic term for a source of optical radiation (i.e. “light”), often called a “bulb” or “tube”. Examples include incandescent, fluorescent, high-intensity discharge (HID) lamps, and low pressure sodium (LPS) lamps, as well as light-emitting diode (LED) modules and arrays.
22. **“Landscape Lighting”** is lighting of trees, shrubs, or other plant material as well as ponds and other landscape features.
23. **“Light Efficient Community”** is a community that uses lighting responsibly. It uses the most effective and efficient artificial lighting available to minimize energy waste, glare, light trespass and pollution by employing designs, measures, legislation and good lighting practices. By doing so the community is able to reduce energy costs and its carbon footprint while preserving the natural environment and ensuring health, safety, and a high quality of life for all.<sup>1</sup>
24. **“Lighting Equipment”** is equipment specifically intended to provide gas or electric illumination, including, but not limited to, lamp(s), luminaire(s), ballast(s), poles, posts, or lens(es), and related structures, electrical wiring, and other necessary or auxiliary components.
25. **“Light Pollution”** is excessive, misdirected, or obtrusive artificial light which competes with starlight in the night sky for urban residents. This light has adverse health effects on urban residents by interrupting the circadian rhythm as well as surrounding ecosystems.
26. **“Light Trespass”** means the shining of light produced by a luminaire beyond the boundaries of the desired application or property on which it is located.
27. **“Lighting Zone”** is an overlay zoning system establishing legal limits for lighting of particular parcels, areas, or districts in a community.
28. **“Low Voltage Lighting”** is lighting powered at less than 15 volts and limited to luminaires having an initial rated luminaire lumen output of 525 lumens or less.
29. **“Lumen”** is the photometric unit of light output and the unit of measure used to quantify the amount of light produced by a lamp or emitted from a luminaire (as distinct from ‘watt,’ a measure of power consumption).

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<sup>1</sup>This definition was adopted by Council on 07 February 2012 in Council Meeting-Resolution 12.29.

30. **“Luminaire”** is a complete lighting unit or fixture, consisting of a lamp (bulb), or lamps and ballast(s) (when applicable), together with the parts designed to distribute the light (reflector, lens, diffuser), to position and protect the lamps, and to connect the lamps to a power supply.
31. **“Luminaire Efficiency”** is a ratio of the light emitted by a luminaire to the light emitted by the lamps inside the luminaire.
32. **“Luminaire Lumens”** is a calculated sum of the initial lamp lumens for all lamps within an individual luminaire, multiplied by luminaire efficiency. If the efficiency is not known for a residential luminaire, it shall be assumed to be 70%. For luminaires with absolute photometry per IES LM-79, it is the total luminaire lumens. The lumen rating of a luminaire assumes the lamp or luminaire is new and has not depreciated in light output.
33. **“Lux”** is the International System of Units (SI) unit of illuminance. One lux is one lumen per metre squared. 1 Lux is a unit of incident illuminance approximately equal 1/10 footcandle.
34. **“Model Lighting Ordinance (MLO)”** is a sample ordinance created by the International Dark-Sky Association (IDA) and the Illuminating Engineering Society (IES) which establishes ‘best practices’ in the use and applications of outdoor lighting. This ordinance suggests regulating the use of outdoor light to minimum recommended levels for night-time safety, utility, security, productivity, enjoyment and commerce. By achieving this safe minimum level of lighting the goals of reducing adverse offsite lighting such as light trespass, obtrusive light, light pollution, and sky glow are achieved.
35. **“Mounting height”** is the height of the photometric centre of a luminaire above grade level. The horizontal spacing of luminaires is often measured in units of mounting height. For example, the luminaires can be spaced at 4 mounting heights apart.
36. **“New lighting”** is lighting for areas not previously illuminated; newly installed lighting of any type except for replacement lighting or lighting repairs.
37. **“Outdoor Lighting”** is lighting equipment installed within the property line and outside the building envelopes, whether attached to poles, building structures, the earth, or any other location; and any associated lighting control equipment.
38. **“Partially shielded luminaire”** is a luminaire with an opaque top, translucent or perforated sides that is designed to emit most light downward.
39. **“Pedestrian Hardscape”** is stone, brick, concrete, asphalt or other similar finished surfaces intended primarily for walking, such as sidewalks and pathways.
40. **“Photometry”** is the science of the measurement of light, in terms of its perceived brightness to the human eye. In modern photometry, the radiant power at each wavelength is weighted by a luminosity function that models human brightness sensitivity.
41. **“Photoelectric Switch”** is a control device employing a photocell or photodiode to detect daylight and automatically switch lights off when sufficient daylight is available.

42. **"Property line"** is the edges of the legally defined extent of privately owned property.
43. **"Relative Photometry"** is photometric measurements made of the lamp plus luminaire, and adjusted to allow for light loss due to reflection or absorption within the luminaire. Reference Standard IES LM-63.
44. **"Repair"** is reconstruction or renewal of any part of an existing luminaire for the purpose of its ongoing operation, other than re-lamping or replacement of components including capacitor, ballast or photocell. Note that retrofitting a luminaire with new lamp and/or ballast technology is not considered a repair and for the purposes of this ordinance the luminaire shall be treated as if new. "Repair" does **not** include normal re-lamping or replacement of components including capacitor, ballast or photocell.
45. **"Replacement Lighting"** is lighting installed specifically to replace existing lighting that is sufficiently broken to be beyond repair.
46. **"Shielded Directional Luminaire"** is a luminaire that includes an adjustable mounting device allowing aiming in any direction and contains a shield, louver, or baffle to reduce direct view of the lamp.
47. **"Sign"** is advertising, directional or other outdoor promotional display of art, words and/or pictures.
48. **"Sky Glow"** is the brightening of the nighttime sky that results from scattering and reflection of artificial light by moisture and dust particles in the atmosphere. Sky glow is caused by light directed or reflected upwards or sideways and reduces one's ability to view the night sky.
49. **"Temporary lighting"** is lighting installed and operated for periods not to exceed 60 days, completely removed and not operated again for at least 30 days.
50. **"Time Switch"** is an automatic lighting control device that switches lights according to time of day.
51. **"Unshielded Luminaire"** is a luminaire capable of emitting light in any direction including downwards.
52. **"Uplight"** is a reference to an exterior luminaire, lumens emitted or radiated in the hemisphere at or above the horizontal plane.
53. **"Vertical Illuminance"** is illuminance measured or calculated in a plane perpendicular to the site boundary or property line.
54. **"Watt"** is a derived unit of power. The unit, "W" is defined as joule per second and can be used to express the rate of energy conversion to light with respect to time.

## **PROCEDURES:**

1. All new or retrofitted luminaires on public or private land within the legal and corporate limits of the Town of Bon Accord shall comply with the minimum requirements of the MLO, namely:
  - a. All lighting fixtures or luminaires over 1000 lumens initial lamp output shall be fully shielded, AND;
  - b. Restrictions on total amount of unshielded lighting, such as a limit on lumens per acre or total site lumens in unshielded fixtures, AND;
  - c. A policy to address over-lighting, such as energy density caps, lumens/acre caps, or maximum illuminance specifications, AND;
  - d. Any outdoor lighting owned by the Town of Bon Accord installed after the adoption of this *Policy* shall have a Correlated Colour Temperature (CCT) of 3,300° K or less. It is recommended that all lighting installed follow this CCT limitation.
  - e. A draft ordinance shall be attached in the Light Efficient Community Bylaw.
  
2. This Policy shall apply to all luminaires lawfully installed and operational since the adoption of Resolution 12.29, passed unanimously by Council on 07 February 2012. This previous Policy created an exception to allow for the “grandfathering” of existing luminaires. All grandfathered luminaires must comply with the Light Efficient Community Bylaw. Upon adoption of this Policy, the exemptions shall be as follows:
  - a. Permanent Exemptions:
    - i. Previously Existing Fixtures;
    - ii. Fossil Fuel Light;
    - iii. Federal and Provincial Facilities;
    - iv. Emergency Conditions;
    - v. Holiday or Seasonal Lighting; OR
    - vi. Event Lighting.
  
  - b. Special Requirements:
    - i. Regional or County Airports;
    - ii. Correctional Institutions.
  
  - c. Any exemptions not covered by the above shall be dealt with by the Chief Administrative Officer of the Town of Bon Accord or their designated officials or assignees.
  
  - d. A full description of the above exemptions is found in the Light Efficient Community Bylaw.
  
3. Upon adoption of this Policy by council, this Policy will be integrated into all related Town policies, standards and regulations, including, but not limited to the Engineering Servicing Standards, the Municipal Development Plan, and the Land Use Bylaw. These policies will address the specific needs of stakeholders in the Town and be created in tandem with educational programs for Town staff, residents and businesses. These policies will respect the following principles:

- a. The Town of Bon Accord will adopt policies and regulations to prevent the installation of any lighting on Town-controlled/owned/operated property that is not dark sky compliant. Further it agrees to continue to implement reasonable lighting curfews on Town-controlled properties and facilities. Further, the Town agrees to install adaptive controls where appropriate and feasible.
- b. Lighting will be used where it is needed, when it is needed, and at levels suited to the required task(s). In some cases, such as natural areas, this may mean a total absence of artificial light. Council or administration will create appropriate lighting zones as defined in the Light Efficient Community Bylaw.
- c. All new or retrofitted luminaires shall employ adaptive controls and reasonable curfews such as but not limited to motion detection sensors, timers, wireless remote monitoring and turn on/off capabilities, photo sensitive light controls, etc. Reasonable curfews shall be determined for all non-essential lights.
- d. Lighting technology will be selected to address visibility needs in the most energy efficient form that is practical.
- e. Luminaires will confine light to the area(s) needing illumination.
- f. Light trespass will be minimized.
- g. Lighting that creates unsafe conditions or harmful glare will not be permitted.
- h. New outdoor lighting fixtures shall be allowed when new Town owned buildings and infrastructure are constructed and when existing buildings and infrastructures are modified with physical alterations or by a change of use and the need for outdoor lighting to provide nighttime safety and utility is deemed necessary by the Town. New lighting fixtures may also be installed on existing buildings and infrastructure in the case where the Town determines that a hazardous nighttime situation exists.
- i. Nothing in this Policy shall be interpreted in such a way that prevents adequate lighting on roadways or other similar public spaces in order to ensure public safety. The definition of adequate lighting will be guided by accepted engineering standards and principles of Crime Prevention through Environmental Design.
- j. Voluntary light curfews will be encouraged for all residential, commercial, recreational and institutional use of exterior night time illumination.
- k. All types of outdoor lighting are subject to this Policy, including, but not limited to light for streets, trails, signs, walls, and landscaping.

### **ROLES AND RESPONSIBILITIES**

The role of **Administration** is to:

1. Ensure alignment of this *Policy* with the Strategic Plan and Integrated Community Sustainability Plan.
2. In collaboration with Planning and Development, oversee creation of appropriate lighting zones and ensure they remain up to date in accordance with the Light Efficient Community Bylaw.
3. Draft a new class of business license which incorporates membership into the IDA and adoption of the dark sky principles by the applicants.

The role of **Planning and Development** is to:

1. Update the Municipal Development Plan and Land Use Bylaw to reflect the principles and goals of this *Policy*.
2. Review all outdoor lighting plans of projects in development and applying for construction permits.
3. Establish lighting zones for existing development and ensure all future development follows the goals and aims of this *Policy*.
4. Provide exceptions for certain intermittent activities such as construction and holiday lighting, while ensuring the goals and principles of this *Policy* remain intact.
5. Develop and implement plans to retrofit existing outdoor lighting owned by the Town to ensure its compliance with this *Policy*.
6. Work with private entities to retrofit lighting on land not owned by the Town to achieve the overall goal of a reduction in light pollution and light trespass in town.
7. Adopt new light efficient standards within the Engineering Services Standards applicable to all zones and land uses.

The role of **Operations** is to:

1. Update lifecycle programs to reflect the principles of this *Policy* and related Schedules as it relates to outdoor lighting.
2. Replace non-conforming luminaires with conforming luminaires anytime repair or replacement to outdoor facility lights is required.
3. Introduce automatic time switches to new and existing facility lights so that luminaires are only lit when facilities are in use.
4. Develop and implement plans to replace non-conforming luminaires with conforming luminaires when upgrading any Town infrastructure.

The role of **Arena, Parks, and Recreation** is to:

1. Update the Open Space and Recreation Facilities Strategy to reflect the principles of this *Policy*.
2. Replace non-conforming luminaires with conforming luminaires when upgrading outdoor lights in public parks and trails, or any time major repair or replacement is required.

The role of **Economic Development and Tourism** is to:

1. Incorporate the principles of this *Policy* into the Economic Development Strategy.
2. Develop a communications plan to create awareness of this *Policy* and ensure compliance with this *Policy* by the business community.

The role of **Communications** is to:

1. Develop a Communications Plan and education strategy to create awareness of this *Policy* in the community. This may include:
  - a. A Light Efficient Community education program for Town staff.
  - b. A website for public education highlighting responsible lighting, the benefits of the *Policy*, and links to further responsible lighting information.

- c. Planning of community events to encourage public participation in adopting the mindset of becoming a Light Efficient Community.
- d. Materials regarding responsible lighting practices and methods to distribute within the community.

## The Bylaw

The bylaw was the project to work on that really put Bon Accord onto a whole new level of commitment to the niche being defined.

It has had both positive and negative resident feedback from residents but it really has identified that as a strategy the Town is committed to moving forward towards the goal of becoming a niche community.

**TOWN OF BON ACCORD  
BYLAW 2015-07  
LIGHT EFFICIENT COMMUNITY STANDARDS BYLAW**

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**A BYLAW OF THE TOWN OF BON ACCORD, IN THE PROVINCE OF ALBERTA TO ESTABLISH TERMS FOR REDUCING LIGHT POLLUTION AND GLARE; ENHANCING THE WELL-BEING OF THE COMMUNITY THROUGH ENVIRONMENTAL ACTION**

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WHEREAS, pursuant to section 7 of the *Municipal Government Act*, R.S.A. 2000, c. M-26, a council may pass bylaws for municipal purposes respecting, inter alia, the following matters:

- a) the safety, health and welfare of people and the protection of people and property;
- b) nuisances, including unsightly property;
- c) businesses, business activities and persons engaged in business;
- d) the enforcement of bylaws made under this or any other enactment; and

WHEREAS, pursuant to section 8 of the *Municipal Government Act*, R.S.A. 2000, c. M-26, a council may, in a bylaw, inter alia:

- a) regulate or prohibit;
- b) provide for a system of licenses, permits or approvals; and

WHEREAS, pursuant to section 640 (4) of the *Municipal Government Act*, R.S.A. 2000, c. M-26, a Council may prohibit or regulate and control the use and development of land and buildings, inter alia:

- a) the design, character and appearance of buildings;
- b) the lighting of land, buildings or other things; and

WHEREAS, the safety and welfare of motorists, pedestrians, and cyclists depend upon the reduction of glare and the establishment of consistent and well-defined levels of lighting; and

WHEREAS, proper direction and use of light will minimize energy wasted on unnecessary and indiscriminate illumination; and

WHEREAS, the Town of Bon Accord recognizes the need to preserve the rural character, aesthetic value, and the unique quality of life of Bon Accord residents by preserving and enhancing the ability to view the night sky; and

WHEREAS, establishing a predetermined standard for outdoor illumination will provide residents, business owners, and developers with a clear set of guidelines by which to follow; and

WHEREAS, a clear set of guidelines for outdoor lighting will eliminate the need for commercial establishments to compete for visual attention by escalating outdoor lighting levels; and

WHEREAS, excessive illumination is harmful.

NOW THEREFORE, THE COUNCIL OF THE TOWN OF BON ACCORD, IN THE PROVINCE OF ALBERTA, DULY ASSEMBLED, ENACTS AS FOLLOWS:

**TOWN OF BON ACCORD  
BYLAW 2015-07  
LIGHT EFFICIENT COMMUNITY STANDARDS BYLAW**

**SECTION 1 – SHORT TITLE**

1.1. This Bylaw may be referred to as "The Light Efficient Community Standards Bylaw".

**SECTION 2 - DEFINITIONS**

- 2.1. **"Absolute photometry"** is a photometric measurement (usually of a solid-state luminaire) that directly measures the footprint of the luminaire. Reference Standard IES LM-79.
- 2.2. **"Astronomic Time Switch"** is an automatic lighting control device that switches outdoor lighting relative to time of solar day with time of year correction.
- 2.3. **"Backlight"** is a reference to an exterior luminaire, lumens emitted in the quarter sphere below horizontal and in the opposite direction of the intended orientation of the luminaire. For luminaires with symmetric distribution, backlight will be the same as front light.
- 2.4. **"BUG"** is luminaire classification system that classifies backlight (B), uplight (U) and glare (G).
- 2.5. **"Canopy"** is a covered, unconditioned structure with at least one side open for pedestrian and/or vehicular access. (An unconditioned structure is one that may be open to the elements and has no heat or air conditioning.)
- 2.6. **"Common Outdoor Areas"** One or more of the following: a parking lot; a parking structure or covered vehicular entrance; a common entrance or public space shared by all occupants of the domiciles.
- 2.7. **"Correlated Colour Temperature"** or CCT is a measure of light source color appearance defined by the proximity of the light source's chromaticity coordinates to the blackbody locus, as a single number rather than the two required to specify a chromaticity.
- 2.8. **"Development Officer"** is an official of Bon Accord appointed, according to the procedures authorized by Town Council, to act as a development authority according to the *Municipal Government Act*.
- 2.9. **"Emergency Conditions"** is lighting that is only energized during an emergency; lighting fed from a backup power source; or lighting for illuminating the path of egress solely during a fire or other emergency situation; or, lighting for security purposes used solely during an alarm.
- 2.10. **"Footcandle"** The unit of measure expressing the quantity of light received on a surface. One footcandle is the illuminance produced by a candle on a surface one foot square from a distance of one foot. One footcandle is equal to one lumen per square foot or approximately 10.76391 lux.
- 2.11. **"Forward Light"** For an exterior luminaire, lumens emitted in the quarter sphere below horizontal and in the direction of the intended orientation of the luminaire.

**TOWN OF BON ACCORD  
BYLAW 2015-07  
LIGHT EFFICIENT COMMUNITY STANDARDS BYLAW**

- 2.12. "Fully Shielded Luminaire"** is a luminaire constructed and installed in such a manner that all light emitted by the luminaire, either directly from the lamp or a diffusing element, or indirectly by reflection or refraction from any part of the luminaire, is projected below the horizontal plane through the luminaire's lowest light-emitting part.
- 2.13. "Glare"** is lighting entering the eye directly from luminaires or indirectly from reflective surfaces that causes visual discomfort or reduced visibility.
- 2.14. "Hardscape"** is permanent landscape improvements to a site including parking lots, drives, entrances, curbs, ramps, stairs, steps, medians, walkways and non-vegetated landscaping that is three (3) metres or less in width. Materials may include concrete, asphalt, stone, gravel, etc.
- 2.15. "Hardscape Area"** is the area measured in square metres of all hardscape. It is used to calculate the Total Site Lumen Limit in both the Prescriptive Method and Performance Methods. Refer to Hardscape definition.
- 2.16. "Hardscape Perimeter"** is the perimeter measured in linear metres and is used to calculate the Total Site Lumen Limit in the Performance Method. Refer to Hardscape definition.
- 2.17. "IDA"** is the International Dark-Sky Association.
- 2.18. "IESNA"** is the Illuminating Engineering Society of North America.
- 2.19. "Illuminance"** is the total luminous flux incident on a surface, per unit area. It is a measure of how much the incident light illuminates the surface, correlated with brightness perception.
- 2.20. "Initial Lumens"** is the amount of light output from a lamp when it is new. For a metal halide lamp, these ratings are averages based on photometry at rated lamp watts after 100 hours of operation.
- 2.21. "Lamp"** is a generic term for a source of optical radiation (i.e. "light"), often called a "bulb" or "tube". Examples include incandescent, fluorescent, high-intensity discharge (HID) lamps, and low pressure sodium (LPS) lamps, as well as light-emitting diode (LED) modules and arrays.
- 2.22. "Landscape Lighting"** is lighting of trees, shrubs, or other plant material as well as ponds and other landscape features.
- 2.23. "Light Efficient Community"** is a community that uses lighting responsibly. It uses the most effective and efficient artificial lighting available to minimize energy waste, glare, light trespass and pollution by employing designs, measures, legislation and good lighting practices. By doing so the community is able to reduce energy costs and its carbon footprint while preserving the natural environment and ensuring health, safety, and a high quality of life for all.<sup>1</sup>

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<sup>1</sup>This definition was adopted by Council on 07 February 2012 in Council Meeting-Resolution 12.29.

**TOWN OF BON ACCORD  
BYLAW 2015-07  
LIGHT EFFICIENT COMMUNITY STANDARDS BYLAW**

- 2.24. “Lighting Equipment”** is equipment specifically intended to provide gas or electric illumination, including, but not limited to, lamp(s), luminaire(s), ballast(s), poles, posts, or lens(es), and related structures, electrical wiring, and other necessary or auxiliary components.
- 2.25. “Light Pollution”** is excessive, misdirected, or obtrusive artificial light which competes with starlight in the night sky for urban residents. This light has adverse health effects on urban residents by interrupting the circadian rhythm as well as surrounding ecosystems.
- 2.26. “Light Trespass”** means the shining of light produced by a luminaire beyond the boundaries of the desired application or property on which it is located.
- 2.27. “Lighting Zone”** is an overlay zoning system establishing legal limits for lighting of particular parcels, areas, or districts in a community.
- 2.28. “Low Voltage Lighting”** is lighting powered at less than 15 volts and limited to luminaires having an initial rated luminaire lumen output of 525 lumens or less.
- 2.29. “Lumen”** is the photometric unit of light output and the unit of measure used to quantify the amount of light produced by a lamp or emitted from a luminaire (as distinct from ‘watt,’ a measure of power consumption).
- 2.30. “Luminaire”** is a complete lighting unit or fixture, consisting of a lamp (bulb), or lamps and ballast(s) (when applicable), together with the parts designed to distribute the light (reflector, lens, diffuser), to position and protect the lamps, and to connect the lamps to a power supply.
- 2.31. “Luminaire Efficiency”** is a ratio of the light emitted by a luminaire to the light emitted by the lamps inside the luminaire.
- 2.32. “Luminaire Lumens”** is a calculated sum of the initial lamp lumens for all lamps within an individual luminaire, multiplied by luminaire efficiency. If the efficiency is not known for a residential luminaire, it shall be assumed to be 70%. For luminaires with absolute photometry per IES LM-79, it is the total luminaire lumens. The lumen rating of a luminaire assumes the lamp or luminaire is new and has not depreciated in light output.
- 2.33. “Lux”** is the International System of Units (SI) unit of illuminance. One lux is one lumen per metre squared. 1 Lux is a unit of incident illuminance approximately equal 1/10 footcandle.
- 2.34. “Model Lighting Ordinance (MLO)”** is a sample ordinance created by the International Dark-Sky Association (IDA) and the Illuminating Engineering Society (IES) which establishes ‘best practices’ in the use and applications of outdoor lighting. This ordinance suggests regulating the use of outdoor light to minimum recommended levels for night-time safety, utility, security, productivity, enjoyment and commerce. By achieving this safe minimum level of lighting the goals of reducing adverse offsite lighting such as light trespass, obtrusive light, light pollution, and sky glow are achieved.

**TOWN OF BON ACCORD  
BYLAW 2015-07  
LIGHT EFFICIENT COMMUNITY STANDARDS BYLAW**

- 2.35. "Mounting height"** is the height of the photometric centre of a luminaire above grade level. The horizontal spacing of luminaires is often measured in units of mounting height. For example, the luminaires can be spaced at 4 mounting heights apart.
- 2.36. "New lighting"** is lighting for areas not previously illuminated; newly installed lighting of any type except for replacement lighting or lighting repairs.
- 2.37. "Outdoor Lighting"** is lighting equipment installed within the property line and outside the building envelopes, whether attached to poles, building structures, the earth, or any other location; and any associated lighting control equipment.
- 2.38. "Partially shielded luminaire"** is a luminaire with an opaque top, translucent or perforated sides that is designed to emit most light downward.
- 2.39. "Pedestrian Hardscape"** is stone, brick, concrete, asphalt or other similar finished surfaces intended primarily for walking, such as sidewalks and pathways.
- 2.40. "Photometry"** is the science of the measurement of light, in terms of its perceived brightness to the human eye. In modern photometry, the radiant power at each wavelength is weighted by a luminosity function that models human brightness sensitivity.
- 2.41. "Photoelectric Switch"** is a control device employing a photocell or photodiode to detect daylight and automatically switch lights off when sufficient daylight is available.
- 2.42. "Premise"** is a house or building, together with its land and outbuildings, as legally described in a real property report as signed by a land surveyor in the Province of Alberta.
- 2.43. "Property line"** is the edges of the legally defined extent of privately owned property.
- 2.44. "Relative Photometry"** is photometric measurements made of the lamp plus luminaire, and adjusted to allow for light loss due to reflection or absorption within the luminaire. Reference Standard IES LM-63.
- 2.45. "Repair"** is reconstruction or renewal of any part of an existing luminaire for the purpose of its ongoing operation, other than re-lamping or replacement of components including capacitor, ballast or photocell. Note that retrofitting a luminaire with new lamp and/or ballast technology is not considered a repair and for the purposes of this *Bylaw* the luminaire shall be treated as if new. "Repair" does **not** include normal re-lamping or replacement of components including capacitor, ballast or photocell.
- 2.46. "Replacement Lighting"** is lighting installed specifically to replace existing lighting that is sufficiently broken to be beyond repair.
- 2.47. "Shielded Directional Luminaire"** is a luminaire that includes an adjustable mounting device allowing aiming in any direction and contains a shield, louver, or baffle to reduce direct view of the lamp.

**TOWN OF BON ACCORD  
BYLAW 2015-07  
LIGHT EFFICIENT COMMUNITY STANDARDS BYLAW**

- 2.48. **“Sign”** is advertising, directional or other outdoor promotional display of art, words and/or pictures.
- 2.49. **“Sky Glow”** is the brightening of the nighttime sky that results from scattering and reflection of artificial light by moisture and dust particles in the atmosphere. Sky glow is caused by light directed or reflected upwards or sideways and reduces one's ability to view the night sky.
- 2.50. **“Temporary lighting”** is lighting installed and operated for periods not to exceed 60 days, completely removed and not operated again for at least 30 days.
- 2.51. **“Time Switch”** is an automatic lighting control device that switches lights according to time of day.
- 2.52. **“Unshielded Luminaire”** is a luminaire capable of emitting light in any direction including downwards.
- 2.53. **“Uplight”** is a reference to an exterior luminaire, lumens emitted or radiated in the hemisphere at or above the horizontal plane.
- 2.54. **“Vertical Illuminance”** is illuminance measured or calculated in a plane perpendicular to the site boundary or property line.
- 2.55. **“Watt”** is a derived unit of power. The unit, “W” is defined as joule per second and can be used to express the rate of energy conversion to light with respect to time.

**SECTION 3 - PREAMBLE**

The problems of light pollution first became an issue in the 1970s when astronomers identified the degradation of the night sky due to the increase in lighting associated with development and growth. As more impacts to the environment by lighting are being identified, an international “dark sky” movement is advocating for the precautionary approach to outdoor lighting design. Many communities have passed anti-light pollution laws and ordinances. However, there is little or no agreement among these laws, and they vary considerably in language, technical quality, and stringency. This leads to ambiguity for designers, engineers, and code officials looking to meet these regulations. The lack of a common basis prevents the development of standards, educational programs, and other means of achieving the goal of effective lighting control. The purpose of this *Bylaw* is to provide regulations for outdoor lighting in the Town of Bon Accord in accordance with an international standard. This lighting includes, but is not limited to all lighting that is provided by the Town of Bon Accord for purposes of public safety and public information, as well as lighting on private property that encompasses commercial development, single family dwellings, and property which has more than one residence on it. As a result of adopting this *Bylaw*, goals aligning with Bon Accord’s “*Building for Tomorrow*” strategy will be achieved, reducing adverse environmental impacts of outdoor lighting in two categories: carbon footprint (energy used in the life of a lighting product) and obtrusive light. This bylaw is based on and adopted from the Model Lighting Ordinance created by the Illuminating Engineering Society and the International Dark-Sky Association. These regulations will:

**TOWN OF BON ACCORD  
BYLAW 2015-07  
LIGHT EFFICIENT COMMUNITY STANDARDS BYLAW**

- 3.1 Permit the use of outdoor lighting that is consistent with the minimum levels specified in Illuminating Engineering Society of North America (IES) recommended practices for nighttime safety, utility, security, productivity, enjoyment, and commerce (Lighting Zones).
- 3.2 Minimize adverse offsite impacts of lighting such as light trespass, and obtrusive light.
- 3.3 Curtail light pollution, reduce skyglow, and improve the nighttime environment for astronomy.
- 3.4 Help protect the natural environment from the adverse effects of night lighting from gas or electric sources, while conserving energy and resources to the greatest extent possible.

**SECTION 4 – LIGHTING ZONES**

Lighting zones reflect the base (or ambient) light levels desired in Bon Accord. Lower lighting zone(s) be given preference when establishing zoning criteria. Using lighting zones allows a great deal of flexibility and customization without the burden of excessive regulation. Selection of lighting zone or zones should be based not on existing conditions but rather on the type of lighting environments the Town seeks to achieve. For instance, new development on previously rural or undeveloped land may be zoned as LZ-1. Additionally, the Town may choose to establish vertical lighting zones with the lighting zone at street level at a higher zone than the residential housing on upper levels. The Lighting Zone shall determine the limitations for lighting as specified by this *Bylaw*. Lighting Zones shall be defined as follows:

**LZ0: No ambient lighting**

Areas where the natural environment will be seriously and adversely affected by lighting. Impacts include disturbing the biological cycles of flora and fauna and/or detracting from human enjoyment and appreciation of the natural environment. Human activity is subordinate in importance to nature. The vision of human residents and users is adapted to the darkness, and they expect to see little or no lighting. When not needed, lighting should be extinguished. This zone typically includes undeveloped areas of open space, wilderness parks and preserves, areas near astronomical observatories, or any other area where the protection of a dark environment is critical. This is the recommended default zone for wilderness areas, parks and preserves, and undeveloped rural areas.

**LZ1: Low ambient lighting**

Areas where lighting might adversely affect flora and fauna or disturb the character of the area. The vision of human residents and users is adapted to low light levels. Lighting may be used for safety and convenience but it is not necessarily uniform or continuous. After curfew, most lighting should be extinguished or reduced as activity levels decline. These typically include single and two family residential communities, rural town centers, business parks, and other commercial or industrial/storage areas typically with limited nighttime activity and may also include the developed areas in parks and other natural settings. This is the recommended default zone for rural and low density residential areas.

**LZ2: Moderate ambient lighting**

Areas of human activity where the vision of human residents and users is adapted to moderate light levels. Lighting may typically be used for safety and convenience but it is not

**TOWN OF BON ACCORD  
BYLAW 2015-07  
LIGHT EFFICIENT COMMUNITY STANDARDS BYLAW**

reference from page 63 of this document

reference from page 63 of this document

reference from page 63 of this document

necessarily uniform or continuous. After curfew, lighting may be extinguished or reduced as activity levels decline. This zone pertains to areas with moderate ambient lighting levels. These typically include multifamily residential uses, institutional residential uses, schools, churches, hospitals, hotels/motels, commercial and/or businesses areas with evening activities embedded in predominately residential areas, neighborhood recreational and playing fields and/or mixed use development with a predominance of residential uses. Can be used to accommodate a district of outdoor sales or industry in an area otherwise zoned LZ-1. This is the recommended default zone for light commercial business districts and high density mixed-use residential districts.

**LZ3: Moderately high ambient lighting**

Areas of human activity where the vision of human residents and users is adapted to moderately high light levels. Lighting is generally desired for safety, security and/or convenience and it is often uniform and/or continuous. After curfew, lighting may be extinguished or reduced in most areas as activity levels decline. These typically include commercial corridors, high intensity suburban commercial areas, town centers, mixed use areas, industrial uses and shipping and rail yards with high night time activity, high use recreational and playing fields, regional shopping malls, car dealerships, gas stations, and other nighttime active exterior retail areas. Recommended default zone for large cities' business districts. It is recommended this zone is not used in Bon Accord.

Tables providing maximum allowable lumens per Lighting Zone are included in this document.

**SECTION 5 - CONFORMANCE WITH PROVINCIAL AND FEDERAL CODES**

All outdoor lighting shall be installed in conformance with the provisions of this *Bylaw*, applicable Electrical and Energy Codes, and applicable sections of the Building Code.

**SECTION 6 - APPLICABILITY**

Except as below, all outdoor lighting installed after the date of adoption of this *Bylaw* shall comply with these requirements. This includes, but is not limited to, new lighting, replacement lighting, or any other lighting whether attached to structures, poles, the earth, or any other location, including lighting installed by any third party.

**6.1. Permanent Exemptions**

6.1.1. Previously Existing Fixtures: All outdoor luminaires existing and lawfully in place prior to the adoption of this *Bylaw* are exempt from the requirements of *this Bylaw*, except that:

6.1.1.1. When existing luminaires become inoperable, replacement in compliance with this *Bylaw* is required.

**TOWN OF BON ACCORD  
BYLAW 2015-07  
LIGHT EFFICIENT COMMUNITY STANDARDS BYLAW**

6.1.1.2. This exemption shall cease to apply when the parcel is subject to a change in use or ownership.

6.1.1.3. Upon renewal of business license, the required fees can, at the discretion of the appropriate officials be reduced by a percentage of costs incurred to achieve compliance with this *Bylaw*.

6.1.1.4. Lighting exempted under Section 6.1.1 shall comply with Section 11 of this *Bylaw*.

6.1.2. Fossil Fuel Light: All outdoor light fixtures producing light **directly** by the consumption of fossil fuels (such as gas lamps, kerosene lanterns, etc.) are exempt from this *Bylaw*.

6.1.3. Federal and Provincial Facilities: Outdoor light fixtures on, in, or in connection with facilities and land owned by the Crown in right of Canada or the Crown in right of Alberta are exempt from this *Bylaw*. Voluntary compliance with the intent of this *Bylaw* is encouraged.

6.1.3.1. Regional or County Airports: Outdoor lighting not regulated by Provincial or Federal agencies or statute, such as lighting for parking lots and pedestrian access shall comply with the *Bylaw*.

6.1.3.2. Correctional Institutions: Outdoor lighting not regulated by Provincial or Federal agencies or statute, such as lighting for parking lots shall be fully shielded.

6.1.4. Emergency Conditions: Under any emergency, real or perceived, by local, provincial or federal authorities, any and all restrictions created by this *Bylaw* shall be, for the duration of the emergency, suspended in order that emergency responders and citizens may carry out their duties to the best of their abilities.

6.2. Special Requirements and Other Exemptions.

The following are not regulated by this *Bylaw*:

6.2.1. Lighting within the public right-of-way or easement for the principal purpose of illuminating roads and highways required by Provincial or Federal legislation. This exemption **shall not** apply to any street lighting installed under the jurisdiction and authority of Bon Accord, or to any lighting within the public right of way or easement when the purpose of the luminaire is to illuminate areas outside of the public right of way or easement.

6.2.2. Lighting used for public monuments and statuary.

6.2.3. Lighting solely for signs (lighting for signs is regulated by **Section 8, Outdoor Signs and Illumination** section of this *Bylaw*.).

6.2.4. Repairs to existing luminaires not exceeding 25% of total installed luminaires.

**TOWN OF BON ACCORD  
BYLAW 2015-07  
LIGHT EFFICIENT COMMUNITY STANDARDS BYLAW**

- 6.2.5. Temporary lighting for theatrical, television, sports areas, and performance areas, only with permit from the authority and recognizing that steps need to be taken to minimize glare and light trespass, and will utilize sensible curfews, as determined by appropriate Town authorities.
- 6.2.6. Intermittent and seasonal lighting required under Alberta Occupational Health and Safety (OH&S) codes for lighting required on construction sites. While not superseding or supplanting the Provincial OH&S code, all lighting shall be restricted to hours during which work is actively taking place and such lighting must be shrouded or shielded to prevent glare and light trespass outside of the property lines of the construction site.
- 6.2.7. Underwater lighting in swimming pools and other water features.
- 6.2.8. Temporary lighting and seasonal lighting provided that individual lamps are less than ten (10) watts and seventy (70) lumens, for the duration of the holiday season. The holiday season shall be defined as lasting from the first day of December to the end of the second week of January.
- 6.2.9. Lighting specified or identified in a specific use permit, which shall not grant permanent exception to this *Bylaw*.
- 6.2.10. Any other exceptions not covered by the above shall be dealt with by designated Town of Bon Accord officials or their assignees. All exceptions must comply with this *Bylaw*, Section 6.2.9.

**SECTION 7 - LIGHTING CONTROL REQUIREMENTS**

Nothing in this section shall be interpreted to provide exemptions to the goals of this *Bylaw*. This section is intended to provide lighting controls which prohibit operation of outdoor lighting when sufficient outdoor lighting is available or such lighting is unnecessary. Additionally, this section will ensure that all outdoor lighting has the capability, either through circuiting, dimming, or alternating sources to guarantee the ability to reduce lighting without necessarily turning all lights off.

7.1. Automatic Switching Requirements. Controls shall be provided that automatically extinguish all outdoor lighting when sufficient daylight is available using a control device or system such as a photoelectric switch, astronomic timer switch or equivalent functions from a programmable lighting controller, building automation system or lighting energy management system, all with batteries or similar backup power or device. If motion sensors are used to comply with this section, the range of the sensor shall not exceed the property line.

7.2. Automatic Lighting Reduction Requirements. The Council or Administration shall establish curfew time(s) for each lighting zone, after which total outdoor lighting lumens shall be reduced by at least 30% or extinguished. The following items are exceptions for which no reduction is required:

reference from page 63 of this document

**TOWN OF BON ACCORD  
BYLAW 2015-07  
LIGHT EFFICIENT COMMUNITY STANDARDS BYLAW**

reference from page 63 of this document

- 7.2.1. Lighting for residential properties including multiple residential properties not having common areas. This exemption shall not apply to landscape lighting, and all such lighting shall comply with all applicable BUG ratings.
- 7.2.2. When the outdoor lighting consists of only one luminaire. This does not circumvent the requirement that such luminaires will be shielded according to applicable BUG ratings.
- 7.2.3. Code required lighting for steps, stairs, walkways, and building entrances. All such luminaires installed under this provision shall be in compliance with this *Bylaw* and “Dark-Sky Friendly” and comply with all applicable BUG ratings.
- 7.2.4. When in the opinion of the Town, lighting levels must be maintained.
- 7.2.5. Motion activated lighting, where the light is extinguished no more than 5 (five) minutes after illumination.
- 7.2.6. Lighting governed by a special use permit in which times of operation are specifically identified.
- 7.2.7. Businesses that operate on a 24-hour basis.

**SECTION 8 - OUTDOOR SIGNS AND ILLUMINATION**

This section deals with signs located in the Town, on public or private property. This section will ensure that the number, appearance, and location of signs balances the need for signs and expression, with safety and aesthetics while providing an adequate and flexible means of identification for commercial and industrial enterprises. This will improve the quality of sign design and upkeep, and minimize the adverse effect of signs on nearby property. It is the responsibility of the owner and the occupier of the lands that are subject to this *Bylaw* to ensure that signs conform to this bylaw.

- 8. All signs shall be maintained in good structural condition at all times so as to ensure that pedestrian and vehicular traffic are not compromised.
- 8.1. All sign copy shall be fastened securely to the sign structure. Where a portion of a copy area has been removed, it shall be replaced within a reasonable timeframe, either with new copy or filled in with material consistent with the sign, as determined by the Development Officer.
- 8.2. All burned out bulbs or damaged panels on a sign shall be replaced within a reasonable timeframe, not exceeding 60 days, or as determined by the Development Officer.
- 8.3. Where a panel is damaged or removed, it shall be replaced with a blank panel until such time as a new panel is installed.
- 8.4. The area within five (5) metres of a Freestanding Sign on private property shall allow access for maintenance. This standard does not exempt any landscaping requirements within this *Bylaw*; however, the landscaping shall allow access for maintenance.

**TOWN OF BON ACCORD  
BYLAW 2015-07  
LIGHT EFFICIENT COMMUNITY STANDARDS BYLAW**

- 8.5. It shall be the responsibility of the landowner to ensure maintenance of a sign is in compliance with the provisions of this *Bylaw*.
- 8.6. A sign with illumination or a sign with an electronic message feature shall not be allowed in agricultural or residential districts.
- 8.7. Any sign located within thirty (30) metres of a residence or a residential district shall not be illuminated between 10:00 p.m. and 6:00 a.m. unless dimmed to no more than 30% of its daytime operation.
- 8.8. Notwithstanding Section 8.8 of this *Bylaw*, a Development Officer may restrict the illumination of any sign, or place conditions on a development permit for a sign that would effectively mitigate any adverse effect as a result of the illumination of the sign on a residential development where, in the opinion of the Development Officer, the sign could cause an adverse effect on a residential development.
- 8.9. Signs that are illuminated shall not:
  - 8.9.1. shine or reflect light directly onto neighboring properties or, in the direction of oncoming traffic;
  - 8.9.2. create hazards for pedestrians or motorists;
  - 8.9.3. be of an intensity or brightness that would interfere with the space, comfort, convenience, and general welfare of residents or occupants of adjacent properties or, with vehicular traffic, in the opinion of the Development Officer.
- 8.10. To prevent “luminance creep,” and in accordance with Section 8.10.3, no sign shall be illuminated with an intensity or brightness greater than 200 lux.
- 8.11. Signs with an electronic message feature shall have automatic timers. These signs shall comply with Section 8.8 of this *Bylaw* and be subject to the same lighting curfew outlined in Section 8.8.
- 8.12. All illuminated signs shall have the capability to be dimmed to the satisfaction of the Development Officer.
- 8.13. Externally illuminated signs shall:
  - 8.13.1. use full cut-off or, shielded and screened external light sources; and
  - 8.13.2. be positioned in a manner that directs the light directly onto the sign; and
  - 8.13.3. minimize any glare off-site.
- 8.14. Internal illuminated signs, where permitted, shall have the light source completely shielded from direct view.
- 8.15. Sign lighting shall be designed to prevent light spill into the sky.

**TOWN OF BON ACCORD  
BYLAW 2015-07  
LIGHT EFFICIENT COMMUNITY STANDARDS BYLAW**

- 8.16. Coloured lights shall not be used at a location or in a manner so as to be confused with, or construed as traffic control devices.
- 8.17. Where a sign is allowed with a changeable display feature for frequently changing messages, the message shall not change more than once every six (6) seconds with a one (1) second transition (hold time) between messages; and the messages on the changeable display feature shall relate to:
  - 8.17.1. special event; or
  - 8.17.2. a use, business or occupant of the site where the sign is located.
  - 8.17.3. All signs regulated by this section of the *Bylaw* shall have a CCT which does not exceed 2,200° K, as determined by the manufacturer.

**SECTION 9 -NON-RESIDENTIAL LIGHTING**

This section addresses commercial and non-residential lighting, including multiple-family residences having common spaces, such as outdoor lobbies; internal roadways, walkways, or parking. Its intent is to:

- 9. Limit the amount of light that can be used;
  - 9.1. Minimize glare by controlling the amount of light that tends to create glare;
  - 9.2. Minimize sky glow by controlling the amount of uplight; and
  - 9.3. Minimize the amount of off-site impacts or light trespass.

This section, and accompanying tables in this document provide two methods for determining compliance. The *prescriptive method* contains precise and easily verifiable requirements for luminaire light output and fixture design that limit glare, uplight, light trespass, and the amount of light that can be used. The *performance method* allows greater flexibility and creativity in meeting the intent of the *Bylaw*. Note that both the prescriptive and the performance method limit the *amount* of light that can be used, but do not control *how* the lighting is to be used. Most outdoor lighting projects that do not involve a lighting professional will use the prescriptive method, because it is simple and does not require engineering expertise. **Only one of the two outlined methods may be used.**

**9.4. *Prescriptive Method***

- 9.4.1. Total Site Lumen Limit. The total installed initial luminaire lumens of all outdoor lighting shall not exceed the total site lumen limit. The total site lumen shall be determined using *either* the Parking Space Method (Table A) or the Hardscape Area Method (Table B). Only one method shall be used per permit application, and for sites with existing lighting, all existing lighting shall be included in the calculation of total installed lumens.

The total installed initial luminaire lumens is calculated as the sum of the initial luminaire lumens for all luminaires.

- 9.4.2. Limits to Offsite Impacts. All luminaires shall be rated and installed according to Table C.

**TOWN OF BON ACCORD  
BYLAW 2015-07  
LIGHT EFFICIENT COMMUNITY STANDARDS BYLAW**

9.4.3. Light Shielding for Outdoor Illumination. All outdoor luminaires emitting more than 1000 lumens shall have no light emitted above ninety (90) degrees as illustrated in Figure 1.

9.4.4. Exception to this restriction is ornamental lighting permitted by special permit only, and shall meet the requirements of Tables C-1, C-2, and C-3 for Backlight, Uplight, and Glare, respectively, without the need for external, field-added modifications.

9.4.4.1. An example for application of the *Prescriptive* method is included in this *Bylaw*.

**9.5 Performance Method**

Total Site Lumen Limit. The total installed initial luminaire lumens of all lighting systems shall not exceed the allowed total initial site lumen. The allowed total initial site lumens shall be determined using Tables D and E. For sites with existing lighting, all existing lighting shall be included in the calculation of total installed lumens.

9.6 The total installed initial luminaire lumens is calculated as the sum of the initial luminaire lumens for all luminaires.

9.6.1 Limits to Off Site Impacts. All luminaires shall be installed using either Option A or Option B. Only one option may be used per permit application.

**Option A:** All luminaires shall be rated and installed according to Table C.

**Option B:** The entire outdoor lighting design shall be analyzed using industry standard lighting software including inter-reflections in the following manner: Input data shall describe the lighting system including luminaire locations, mounting heights, aiming directions, and employing photometric data tested in accordance with IES guidelines. Buildings or other physical objects on the site within three object heights of the property line must be included in the calculations.

9.6.2 Analysis shall utilize an enclosure comprised of calculation planes with zero reflectance values around the perimeter of the site.

The design complies if:

- i. The total lumens on the inside surfaces of the virtual enclosure are less than fifteen (15%) percent of the total site lumen limit; and
  - ii. The maximum vertical illuminance on any vertical surface is less than the allowed maximum illuminance per Table F.
- a. An example application of the *Performance* method is included in this *Bylaw*.

**TOWN OF BON ACCORD  
BYLAW 2015-07  
LIGHT EFFICIENT COMMUNITY STANDARDS BYLAW**

**SECTION 10 - RESIDENTIAL LIGHTING**

This section applies to single family homes, duplexes, row houses, and low rise multi-family buildings of four (4) dwelling units or less. For residential properties including multiple residential properties not having common areas, all outdoor luminaires shall not exceed the allowed lumen output in Table G, row 2.

The following exceptions shall apply to this section:

- 10.1 One partly shielded or unshielded luminaire at the main entry, which shall not exceed the allowed lumen output in Table G, row 1;
- 10.2 Any other partly shielded or unshielded luminaires not exceeding the allowed lumen output in Table G, row 3;
- 10.3 Low voltage landscape lighting aimed away from adjacent properties and not exceeding the allowed lumen output in Table G, row 4;
- 10.4 Shielded directional flood lighting aimed so that direct glare is not visible from adjacent properties and not exceeding the allowed lumen output in Table G, row 5;
- 10.5 Open flame gas lamps;
- 10.6 Lighting installed with a vacancy sensor, where the sensor extinguishes the lights no more than 5 minutes after the area is vacated;
- 10.7 Lighting controlled by movement or other sensors shall be positioned so the range of their trigger mechanism does not exceed the property line, as determined by the land title of the property;
- 10.8 All Residential Landscape Lighting shall:
  - 10.8.1 Comply with Table G of this *Bylaw*; and
  - 10.8.2 Shall not be aimed into adjacent properties.
- 10.9 Lighting exempt per Section 6 of this *Bylaw*.

An example of the application of this section can be found in this *Bylaw*.

**SECTION 11 - EXISTING LIGHTING**

Amortization allows existing lighting to gradually and gracefully come into compliance. Substantial changes or additions to existing properties are considered the same as new construction, and must comply. Most outdoor lighting can be fully depreciated once it is fully amortized, usually no longer than

**TOWN OF BON ACCORD  
BYLAW 2015-07  
LIGHT EFFICIENT COMMUNITY STANDARDS BYLAW**

10 years, if not sooner, from the date of initial installation. Bon Accord Administration may require compliance sooner for “easy fixes” such as re-aiming or lowering lumen output of lamps. Where lighting is judged to be a safety hazard, immediate compliance shall be required. Lighting installed prior to the effective date of this *Bylaw* shall comply with the following:

11.1 *Amortization* On or before January 1, 2023, all outdoor lighting shall comply with this Code.

11.2 *New Uses or Structures, or Change of Use*

Whenever there is a new use of a property (zoning or variance change) or the use on the property is changed, all outdoor lighting on the property shall be brought into compliance with this *Bylaw* before the new or changed use commences.

11.3 *Additions or Alterations* Major Additions

If a major addition occurs on a property, lighting for the entire property shall comply with the requirements of this Code. For purposes of this section, the following are considered to be major additions:

11.3.2 Additions of 25 percent or more in terms of additional dwelling units, gross floor area, seating capacity, or parking spaces, either with a single addition or with cumulative additions after the effective date of this *Bylaw*.

11.3.3 Single or cumulative additions, modification or replacement of 25 percent or more of installed outdoor lighting luminaires existing as of the effective date of this *Bylaw*.

11.3.4 Minor Modifications, Additions, or New Lighting Fixtures for Non-residential and Multiple Dwellings:

11.3.5 For non-residential and multiple dwellings, all additions, modifications, or replacement of more than 25 percent of outdoor lighting fixtures existing as of the effective date of this *Bylaw* shall require the submission of a complete inventory and site plan detailing all existing and any proposed new outdoor lighting. **Any new lighting shall meet the requirements of this *Bylaw*.**

11.3.6 Resumption of Use after Abandonment

11.3.6.1 If a property with non-conforming lighting is abandoned for a period of 180 days or more, then all outdoor lighting shall be brought into compliance with this *Bylaw* before any further use of the property occurs.

**SECTION 12 - PROCEDURAL REQUIREMENTS AND PLAN SUBMISSION**

For all subdivision, land-development applications, and building permits where outdoor lighting is required or proposed, lighting plans shall be submitted to Town Administration for review and approval. Plan submission for residential renovations is voluntary; however any changes to lighting shall comply

**TOWN OF BON ACCORD  
BYLAW 2015-07  
LIGHT EFFICIENT COMMUNITY STANDARDS BYLAW**

with this *Bylaw*. Field verification can be achieved by asking the applicant and/or owner to verify that the luminaire type, lamp type and wattages specified have been used. The applicant shall provide the photometric data for each luminaire, since the initial luminaire lumens and B-U-G ratings are stated on the photometric report. However, if a jurisdiction requires additional on-site verification, it may also request a point-by-point photometric plan. While this will not be a true measure of compliance with the criteria of this *Bylaw*, comparing the actual measured levels on site to the photometric plan can be an indication whether or not the installed lighting varies from the approved design. The minimum requirements for these plans shall include:

- 12.1 A site plan complete with all structures, parking spaces, building entrances, traffic areas (both vehicular and pedestrian), vegetation or landscape features that may interfere with lighting, and all adjacent uses. The site plan shall show, by location, and identify each existing and proposed luminaire and shall specify its installed height, pole foundation details, and mounting methods;
- 12.2 A summary table identifying the maximum and minimum light levels for all parking entryways, signs, and walkways.
- 12.3 A description of each luminaire identified in the site plan including the manufacturer, model number, a photograph or catalog cut, photometric data verifying compliance requirements specified within this *Bylaw*, light output in initial lumens, shielding or glare reduction devices, lamp type, and on/off control devices.
- 12.3 If a developer or other entity is using the *Performance Method*, as outlined in Section 9, the following shall also be supplied:
  - 12.3.1 Iso-footcandle plots illustrating each typical installation for all luminaire types, or 3m by 3m illuminance-grid plots for multi-fixture lighting installations, which demonstrate compliance with all applicable requirements set forth within this *Bylaw*. The plots shall indicate the location of each existing and proposed luminaire, the installed height of said luminaires, and the overall light levels in **foot-candles** on the entire zoned.

**SECTION 13 - TABLES AND CALCULATIONS**

**Table A  
Allowed Total Initial Luminaire Lumens per Site for Nonresidential Outdoor Lighting, Per Parking Space Method**

May only be applied to properties up to 10 parking spaces (including handicapped accessible spaces).

LZ-0	LZ-1	LZ-2	LZ-3
300 lms/space	450 lms/space	630 lms/space	840 lms/space

**TOWN OF BON ACCORD  
BYLAW 2015-07  
LIGHT EFFICIENT COMMUNITY STANDARDS BYLAW**

**Table B  
Allowed Total Initial Lumens per Site for Nonresidential Outdoor Lighting,  
Hardscape Area Method**

May be used for any project. When lighting intersects off site driveways and public streets or roads, a total of 55 square metres for each intersection may be added to the actual site hardscape area to provide for intersection lighting.

LZ-0	LZ-1	LZ-2	LZ-3
Base Allowance			
5.5 lumens per m <sup>2</sup> of Hardscape	15 lumens per m <sup>2</sup> of Hardscape	26.75 lumens per m <sup>2</sup> of Hardscape	55 lumens per m <sup>2</sup> of Hardscape

**TOWN OF BON ACCORD  
BYLAW 2015-07  
LIGHT EFFICIENT COMMUNITY STANDARDS BYLAW**

**Table B-1  
Allowed Total Initial Lumens per Site for Nonresidential Outdoor Lighting,  
Hardscape Area Method**

Lumen Allowances, in Addition to Base Allowance.

	LZ-0	LZ-1	LZ-2	LZ-3
Additional allowances for sales and service facilities. No more than two additional allowances per site. See accompanying notes.				
Outdoor Sales Lots	0	40 lumens per m <sup>2</sup> .	85 lumens per m <sup>2</sup> .	170 lumens per m <sup>2</sup> .
Outdoor Sales Frontage	0	0	305 per linear metre	450 per linear metre
Drive Up Windows	0	2,000 lumens per drive up window	4,000 lumens per drive up window	8,000 lumens per drive up window
Vehicle Service Station	0	4,000 lumens per pump (based on 5fc horiz)	8,000 lumens per pump (based on 10fc horiz)	16,000 lumens per pump (based on 20fc horiz)

Notes accompanying Table B-1:

**Outdoor Sales Lot** refers to an allowance in lumens per square metre of uncovered sales lots used exclusively for the display of vehicles or other merchandise for sale and may not include driveways, parking or other non-sales areas. To use this allowance, luminaires must be within 2 mounting heights of sales lot area.

**Outdoor Sales Frontage** refers an allowance for linear metres of sales frontage immediately adjacent to the principle viewing location(s) and unobstructed for its viewing length. A corner sales lot may include two adjacent sites provided that a different viewing location exists for each side. In order to use this allowance, luminaires must be located between principle viewing location(s) and the frontage outdoor sales area.

**Drive Up Windows** refers to an allowance which require the luminaires to be within 6 horizontal metres of the centre of the window.

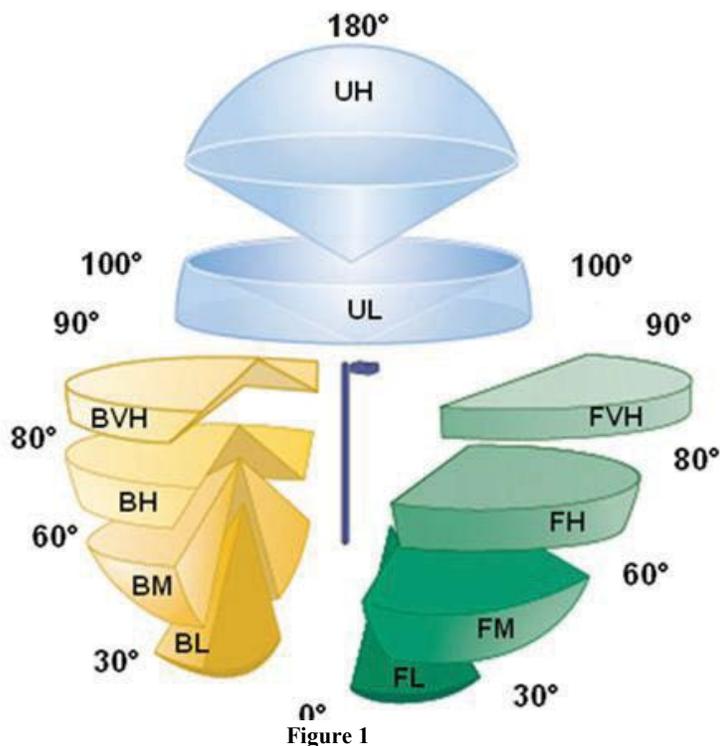
**Vehicle Service Station** refers to an allowance of lumens per installed pump.

**TOWN OF BON ACCORD  
BYLAW 2015-07  
LIGHT EFFICIENT COMMUNITY STANDARDS BYLAW**

**Tables C1-C3**

**Maximum Allowable Backlight, Uplight and Glare (BUG) Ratings**

May be used for any project. A luminaire may be used if it is rated for the lighting zone of the site or lower in number for all ratings B, U and G. Luminaires equipped with adjustable mounting devices permitting alteration of luminaire aiming in the field shall not be permitted. As this is a relatively new and not yet well-known rating system, more explanation of how the rating system works is provided here. For example, more traditional terms such as “full cutoff” are used in this *Bylaw*. It will be very important that all groups recognize that older terms and concepts are inadequate for the complex tasks of controlling light pollution. It is recommended that the new rating system adopted in TM-15, the *Luminaire Classification System for Outdoor Luminaires*, developed in 2005 by the IES and followed herein by the **Table C**, be used intact and exclusively. BUG requires downlight only with low glare (better than full cut off) in lighting zones (LZ) 0, 1 and 2, but allows a minor amount of uplight in lighting zone 3. In lighting zone 3, the amount of allowed uplight is enough to permit the use of very well shielded luminaires that have a decorative drop lens or chimney so that dark sky friendly lighting can be installed in places that traditional-appearing luminaires are required. BUG typically cannot be used for residential luminaires unless they have been photometrically tested. For non-photometrically tested residential luminaires, shielding description is used instead. The lumen limits established for each lighting zone apply to all types of lighting within that zone. Lighting installed under **Section 9 and Section 10** shall comply with all necessary BUG ratings described below. This includes, but is not limited to, specialty lighting, façade lighting, security lighting and the front row lighting for auto dealerships. BUG rating limits are defined for each luminaire and are based on the internal and external design of the luminaire, its aiming, and the initial luminaire lumens of the specified luminaires. The BUG rating limits also take into consideration the distance the luminaire is installed from the property line in multiples of the mounting height (See Table C).



The three components of BUG ratings are based on IES TM-15-07 (revised):

**Backlight**, which creates light trespass onto adjacent sites. The B rating takes into account the amount of light in the BL, BM, BH and BVH zones, which are in the direction of the luminaire OPPOSITE from the area intended to be lighted.

**TOWN OF BON ACCORD  
BYLAW 2015-07  
LIGHT EFFICIENT COMMUNITY STANDARDS BYLAW**

**Uplight**, which causes artificial sky glow. Lower uplight (zone UL) causes the most sky glow and negatively affects both professional and academic astronomy. Upper uplight (UH) not reflected off a surface is mostly energy waste. The U rating defines the amount of light into the upper hemisphere with greater concern for the light at or near the horizontal angles (UL).

**Glare**, which can be annoying or visually disabling. The G rating takes into account the amount of frontlight in the FH and FVH zones as well as BH and BVH zones. BUG ratings apply to the Lighting Zone of the property under consideration.

Figure 1

**Key:**

UH=Uplight High	BVH=Backlight Very High	FVH=Forward Light Very High
UL=Uplight Low	BH=Backlight High	FH=Forward Light High
	BM=Backlight Medium	FM=Forward Light Medium
	BL=Backlight Low	FL=Forward Light Low

In general, a higher BUG rating means more light is allowed in solid angles, and the rating increases with the lighting zone. However, a higher B (backlight) rating simply indicates that the luminaire directs a significant portion of light behind the pole, so B ratings are designated based on the location of the luminaire with respect to the property line. A high B rating luminaire maximizes the spread of light, and is effective and efficient when used far from the property line. When luminaires are located near the property line, a lower B rating will prevent unwanted light from interfering with neighboring properties.

At the 90-180 degree ranges:

1. Lighting Zone 0 allows no light above 90 degrees.
2. Lighting Zone 1 allows only 10 lumens in the UH and UL zones, 20 lumens total in the complete upper hemisphere. (This is roughly equivalent to a 5W incandescent lamp).
3. Lighting Zone 2 allows only 50 lumens in the UH and UL zones, 100 lumens total (less than a 25W incandescent lamp).
4. Lighting Zone 3 allows only 500 lumens in the UH and UL zones, 1000 lumens total (about the output of a 75W incandescent bulb).

**TOWN OF BON ACCORD  
BYLAW 2015-07  
LIGHT EFFICIENT COMMUNITY STANDARDS BYLAW**

**Table C-1  
Maximum Allowable Backlight (BUG) Ratings**

Table C-1	LZ-0	LZ-1	LZ-2	LZ-3
Allowed Backlight Rating*				
Greater than 2 mounting heights from property line	B1	B3	B4	B5
1 to less than 2 mounting heights from property line and ideally oriented.**	B1	B2	B3	B4
0.5 to 1 mounting heights from property line and ideally oriented.**	B0	B1	B2	B3
Less than 0.5 mounting heights to property line and properly oriented.**	B0	B0	B0	B1

\* For property lines that abut public walkways, bikeways, plazas, and parking lots, the property line may be considered to be 1.5 metres beyond the actual property line for purpose of determining compliance with this section. For property lines that abut public roadways and public transit corridors, the property line may be considered to be the centerline of the public roadway or public transit corridor for the purpose of determining compliance with this section.

**NOTE:** This adjustment is relative to Table C-1 and C-3 only and shall not be used to increase the lighting area of the site.

\*\* To be considered 'ideally oriented', the luminaire must be mounted with the backlight portion of the light output oriented perpendicular and towards the property line of concern.

**TOWN OF BON ACCORD  
BYLAW 2015-07  
LIGHT EFFICIENT COMMUNITY STANDARDS BYLAW**

**Table C-2  
Maximum Allowable Uplight (BUG) Ratings - Continued**

Table C-2	LZ-0	LZ-1	LZ-2	LZ-3
Allowed Uplight Rating	U0	U1	U2	U3
Allowed Percentage (%) light emission above 90° for street or area lighting	0%	0%	0%	0%

**Table C-3  
Maximum Allowable Glare (BUG) Ratings - Continued**

Table C-3	LZ-0	LZ-1	LZ-2	LZ-3
Allowed Glare Rating	G0	G1	G2	G3
Any luminaire not ideally oriented*** with 1 to less than 2 mounting heights to any property line of concern	G0	G0	G1	G1
Any luminaire not ideally oriented*** with 0.5 to 1 mounting heights to any property line of concern	G0	G0	G0	G1
Any luminaire not ideally oriented*** with less than 0.5 mounting heights to any property line of concern	G0	G0	G0	G0

\*\*\*Any luminaire that cannot be mounted with its backlight perpendicular to any property line within 2x the mounting height of the luminaire location shall meet the reduced Allowed Glare Rating in Table C-3.

**TOWN OF BON ACCORD  
BYLAW 2015-07  
LIGHT EFFICIENT COMMUNITY STANDARDS BYLAW**

**Table D**

**Performance Method Allowed Total Initial Site Lumens**

May be used for any project.

Lighting Zone	LZ 0	LZ 1	LZ 2	LZ 3
Allowed Lumens per m <sup>2</sup>	5	12	25	50
Allowed Base Lumens per Site	0	3,500	7,000	14,000

**Table E**

**Performance Method Additional Initial Luminaire Lumen Allowances.**

All of the following are “use it or lose it” allowances. All area and distance measurements are in plan view unless otherwise noted.

Lighting Application	LZ 0	LZ 1	LZ 2	LZ 3
Additional Lumens Allowances for All Buildings except service stations and outdoor sales facilities. A <b>MAXIMUM OF THREE (3) ALLOWANCES ARE PERMITTED.</b>				
Building Entrance or Exits	400	1,000	2,000	4,000
Building Facades	0	0	85/m <sup>2</sup>	170/m <sup>2</sup>
Sales or Non-sales Canopies	0	30/m <sup>2</sup>	60/m <sup>2</sup>	130/m <sup>2</sup>
Guard Stations	0	60/m <sup>2</sup>	130/m <sup>2</sup>	255/m <sup>2</sup>
Outdoor Dining	0	10/m <sup>2</sup>	50/m <sup>2</sup>	110/m <sup>2</sup>
Drive Up Windows	0	2,000 lumens per window	4,000 lumens per window	8,000 lumens per window
Additional Lumens Allowances for Service Stations only. Service stations may not use any other additional allowances.				
Vehicle Service Station Hardscape	0	40/m <sup>2</sup>	85/m <sup>2</sup>	170/m <sup>2</sup>
Vehicle Service Station Canopies	0	85/m <sup>2</sup>	170/m <sup>2</sup>	340/m <sup>2</sup>
Additional Lumens Allowances for Outdoor Sales facilities only. Outdoor Sales facilities may not use any other additional allowances. <b>NOTICE:</b> lighting permitted by these allowances shall employ controls extinguishing this lighting after a curfew time to be determined by the Authority.				
Outdoor Sales Lots	0	40/m <sup>2</sup>	85/m <sup>2</sup>	130/m <sup>2</sup>
Outdoor Sales Frontage	0	0	305/linear metre	450/linear metre

Notes accompanying Table E:

**Sales or Non-sales Canopies.** This allowance is lumens per unit area for the total area within the drip line of the canopy. In order to qualify for this allowance, luminaires must be located under the canopy.

**TOWN OF BON ACCORD  
BYLAW 2015-07  
LIGHT EFFICIENT COMMUNITY STANDARDS BYLAW**

**Guard Stations.** This allowance is lumens per unit area of guardhouse plus 185 m<sup>2</sup> per vehicle lane. In order to use this allowance, luminaires must be within 2 mounting heights of a vehicle lane or the guardhouse.

**Outdoor Dining.** This allowance is lumens per unit area for the total illuminated hardscape of outdoor dining. In order to use this allowance, luminaires must be within 2 mounting heights of the hardscape area of outdoor dining.

**Drive Up Windows.** This allowance is lumens per window. In order to use this allowance, luminaires must be within 1.85 m<sup>2</sup> of the center of the window.

**Vehicle Service Station Hardscape.** This allowance is lumens per unit area for the total illuminated hardscape area less area of buildings, area under canopies, area off property, or areas obstructed by signs or structures. In order to use this allowance, luminaires must be illuminating the hardscape area and must not be within a building, below a canopy, beyond property lines, or obstructed by a sign or other structure.

**Vehicle Service Station Canopies.** This allowance is lumens per unit area for the total area within the drip line of the canopy. In order to use this allowance, luminaires must be located under the canopy.

**Outdoor Sales Lots.** This allowance is lumens per square foot of uncovered sales lots used exclusively for the display of vehicles or other merchandise for sale, and may not include driveways, parking or other non-sales areas and shall not exceed 25% of the total hardscape area. To use this allowance, Luminaires must be within 2 mounting heights of the sales lot area.

**Outdoor Sales Frontage.** This allowance is for lineal metres of sales frontage immediately adjacent to the principal viewing location(s) and unobstructed for its viewing length. A corner sales lot may include two adjacent sides provided that a different principal viewing location exists for each side. In order to use this allowance, luminaires must be located between the principal viewing location and the frontage outdoor sales area.

The allowable light levels for the uses defined in Table E may be used to set a prescriptive lighting allowance for these uses in each lighting zone. It should be noted that the lighting allowance defined in Table E is only applicable for the area defined for that use and cannot be transferred to another area of the site. For some uses, such as outdoor sales, the jurisdiction is encourages to define a percentage of the total hardscape area that is eligible for the additional lighting allowance. For example, a set percentage of a car dealership's lot may be considered a display area and receive the additional lighting allowance where the remainder of the lot would be considered storage, visitor parking, etc. and cannot exceed the base light levels defined in Table A.

**TOWN OF BON ACCORD  
BYLAW 2015-07  
LIGHT EFFICIENT COMMUNITY STANDARDS BYLAW**

**Table F  
Maximum Vertical Illuminance at any point in the plane of the property line.**

Lighting Zone 0	Lighting Zone 1	Lighting Zone 2	Lighting Zone 3
0.05 FC or 0.5 LUX	0.1 FC or 1.0 LUX	0.3 FC or 3.0 LUX	0.8 FC or 8.0 LUX

**Table G  
Residential Lighting Limits**

Lighting Application	LZ 0	LZ 1	LZ 2	LZ 3
<b>Row 1</b> Maximum Allowed Luminaire Lumens* for Unshielded Luminaires at one entry only.	Not Allowed	420 lumens	630 lumens	630 lumens
<b>Row 2</b> Maximum Allowed Luminaire Lumens* for each Fully Shielded Luminaire.	630 lumens	1,260 lumens	1,260 lumens	1,260 lumens
<b>Row 3</b> Maximum Allowed Luminaire Lumens* for each Unshielded Luminaire excluding main entry.	Not Allowed	315 lumens	315 lumens	315 lumens
<b>Row 4</b> Maximum Allowed Luminaire Lumens* for each Landscape Lighting.	Not Allowed	Not Allowed	1,050 lumens	2,100 lumens
<b>Row 5</b> Maximum Allowed Luminaire Lumens* for each Shielded Directional Flood Lighting.	Not Allowed	Not Allowed	1,260 lumens	2,100 lumens
<b>Row 6</b> Maximum Allowed Luminaire Lumens* for each Low Voltage Landscape Lighting.	Not Allowed	Not Allowed	525 lumens	525 lumens

\* Luminaire lumens equals Initial Lamp Lumens for a lamp, multiplied by the number of lamps in the luminaire lot, and at the property lines.

**SECTION 14 - EXAMPLE OF THE PRESCRIPTIVE METHOD**

For the prescriptive method, the initial luminaire lumen allowances defined in Table A (Parking Space Method) or B (Hardscape Area Method) will provide basic lighting (parking lot and lighting at doors and/or sensitive security areas) that is consistent with the selected lighting zone. The prescriptive method is intended to provide a safe lighting environment while reducing sky glow and other adverse offsite impacts. The Per Parking Space Method is applicable in small rural towns and is a simple method for small retail “mom and pop” operations without drive lane access and where the parking lot is immediately adjacent to the road. The Town may also allow a prescriptive method for classes of sites, such as car dealerships, gas stations, or other common use areas.

Note that the values are for initial luminaire lumens, not footcandles on the target (parking lot, sidewalk, etc). Variables such as the efficiency of the luminaire, dispersion, and lamp wear can affect the actual amount of light so the lumens per square foot allowance is not equal to footcandles on the site. By specifying initial luminaire lumen values, it is easier for the Development Officer to verify that the requirement is being met. Initial luminaire lumens are available from photometric data. Each initial luminaire lumens calculation should be supplied on the submittal form.

**TOWN OF BON ACCORD  
BYLAW 2015-07  
LIGHT EFFICIENT COMMUNITY STANDARDS BYLAW**

Solid state luminaires, such as LEDs, do not have initial lamp lumens, only initial luminaire lumens (absolute photometry). Other luminaires tested with relative photometry will have initial luminaire lumens which can be calculated by multiplying initial lamp lumens by the luminaire efficiency. In this example, three types of luminaires are used to light a parking area and building entry in a light commercial area. Two of these three luminaires use metal halide lamps: 70 watt wall mounted area lights and 150 watt pole mounted area lights. For these, the Initial Luminaire Lumens is equal to the initial lamp lumens multiplied by the luminaire efficiency. These values are entered into the compliance chart. The lumen value for the building mounted LED luminaires is equal to the lumens exiting the luminaire. Therefore, the value already represents the Initial Luminaire Lumens and no luminaire efficiency is needed. The total Luminaire Lumens for the site is equal to 247,840.

The allowable lumens are based on the lighting zone and the total hardscape area. Referencing Table B, the allowed lumens are 26.75/m<sup>2</sup> for LZ2. Multiplying this by the total hardscape area gives a value of 248,507.5 lumens allowed. Because this value is greater than the value calculated for the site, the project complies.

In this example, three types of luminaires are used to light a parking area and building entry in a light commercial area. Two of these three luminaires use metal halide lamps: 70 watt wall mounted area lights and 150 watt pole mounted area lights. For these, the Initial Luminaire Lumens is equal to the initial lamp lumens multiplied by the luminaire efficiency. These values are entered into the compliance chart. The lumen value for the building mounted LED luminaires is equal to the lumens exiting the luminaire. Therefore, the value already represents the Initial Luminaire Lumens and no luminaire efficiency is needed. The total Luminaire Lumens for the site is equal to 247,840. The allowable lumens are based on the lighting zone and the total hardscape area. Referencing Table B, the allowed lumens are 2.5/SF for LZ2. Multiplying this by the total hardscape square footage gives a value of 248,507.5 lumens allowed. Because this value is greater than the value calculated for the site, the project complies.

Prescriptive Method			
Lamp Descriptions	Qty	Initial Luminaire Lumens	Total
70 W Metal Halide	8	3,920	31,360
150 W Metal Halide	20	9,600	192,000
18 W LED	24	1,020	24,480
Total Site Initial Luminaire Lumens			247,840
Site Allowed Total Luminaire Lumens*			248,507.5
Project Compliance			Yes

\*Listed below is the method of determining the allowed total initial lumens for non-residential outdoor lighting using the hardscape area method (Table B).

Site Allowed Total Initial Lumens	
Site Description	Light Commercial
Lighting Zone	LZ-2
Hardscape Area (m <sup>2</sup> )	9,290
Allowed Lumens per m <sup>2</sup> of Hardscape	26.75

**TOWN OF BON ACCORD  
BYLAW 2015-07  
LIGHT EFFICIENT COMMUNITY STANDARDS BYLAW**

Site Allowed Total Initial Lumens (Lumens per m <sup>2</sup> x hardscape area)	248,507.5
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The prescriptive method of this *Bylaw* restricts uplighting, including upward light emitted by decorative luminaires. The Town of Bon Accord may choose to preserve some types of lighting, including lighting of monuments or historic structures. In this case, the Town shall exempt or otherwise regulate these types of lighting carefully so that it does not inadvertently allow glaring or offensive lighting systems.

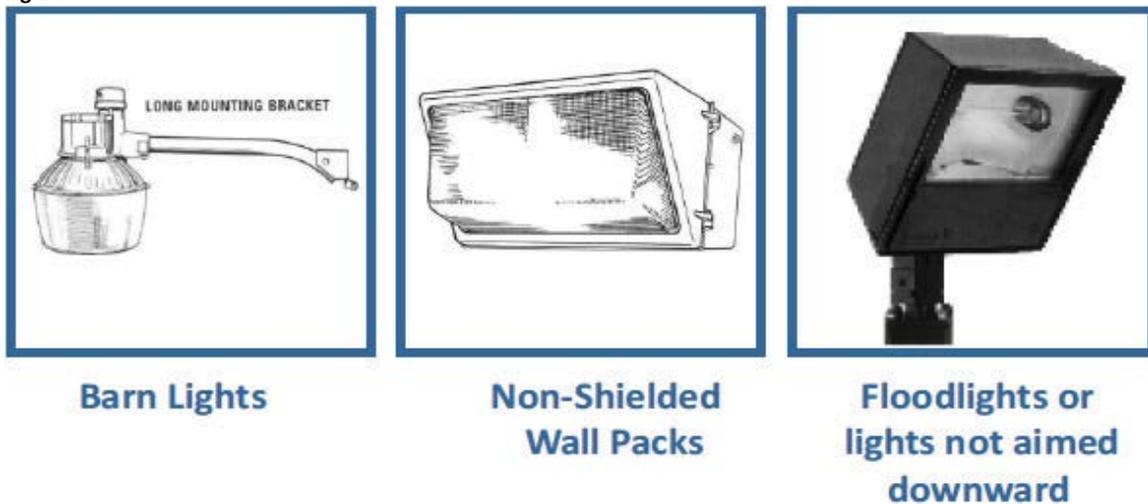
Offsite effects of light pollution include glare, light trespass, sky glow, and impacts on the nocturnal environment. All of these are functions of the fixture or luminaire design and installation. This *Bylaw* replaces the previous luminaire classification terminology of full cut-off, semi cut-off, and cut-off because those classifications were not as effective in controlling offsite impacts as with the IESNA luminaire classification system as described in TM-15-07.

A traditional method of defining light trespass is to identify a maximum light level at or near the property line. However, this method does not address offensive light that is not directed toward the ground, or the intensity of glaring light shining into adjacent windows. The requirements defined in Table C limit the amount of light in all quadrants that is directed toward or above the property line. The Backlight/Uplight/Glare (BUG) rating will help limit both light trespass and glare. (A detailed explanation of the BUG system is provided in this *Bylaw*. Tables C1 - C3 provide further details.) The limits for light distribution established in Table C (for the BUG rating system) prevent or severely limit all direct upward light. A small amount of uplight reflected by snow, light-colored pavement or a luminaire's supporting arms is inevitable and is not limited by the prescriptive method of this *Bylaw*.

A seemingly non-compliant fixture, such as a post-top translucent acorn luminaire, may in certain cases meet the BUG ratings, as long as it has proper interior baffling within the acorn globe. However, the BUG ratings in Table C will limit the use of the following types of luminaires in all lighting zones:

Figure

2



**TOWN OF BON ACCORD  
BYLAW 2015-07  
LIGHT EFFICIENT COMMUNITY STANDARDS BYLAW**

**SECTION 15 - EXAMPLE OF THE PERFORMANCE METHOD**

The performance method is best for projects with complex lighting requirements or when the applicant wants or needs more flexibility in lighting design. The performance method is also used when any lighting designer plans to aim or direct any light fixture upward (above 90 degrees). An engineer or lighting professional generally will be required to design within the performance method. An adopting jurisdiction may also wish to hire an engineer or lighting professional to review and approve projects using this method and/or incorporate review of the performance method into special review procedures. The performance method is also best for projects where higher lighting levels are required compared to typical area lighting. An example might be a car sales lot where more light might be required on the new cars than would be needed for a standard parking lot. Another example is a gas station canopy requiring more light than a building entrance canopy. The first step in the performance method regulates overlighting by establishing the Total Initial Site Lumens (Table D) that are allowed.

Allowances include the total of the following (Table D):

1. Initial lumen allowance per site
2. Per area (m<sup>2</sup>) of hardscape

Table E allows additional lumens for unique site conditions. Examples of allowances include:

1. Per building entrance/exit
2. Per length (linear mere) of Outdoor Sales Frontage Perimeter
3. Per area (m<sup>2</sup>) of Vehicle Service Station Canopy
4. Plus other examples described in Table E.

The Site Total Initial Site Lumens allowed are a combination of allowances from Table D and Table E. The second step in the performance method is to determine if the proposed luminaires are producing off site impacts such as glare, sky glow and light trespass. One may either use Option A which are the Maximum Allowable BUG Ratings in Table C, or Option B through computer lighting calculations show compliance with Maximum Vertical Illuminance at any point in the plane of the property line in Table F. Option B will be required for all non-residential luminaires that:

1. Do not have BUG ratings, or
2. Exceed the BUG ratings,
3. Are not fully shielded, or
4. Have adjustable mountings.

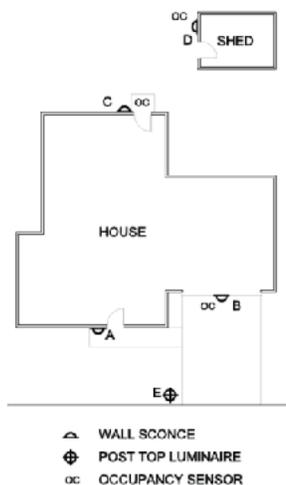
For the performance method, Option B (2) requires photometric calculations for the site perimeter, to a height of no less than 33 feet (10 metres) above the tallest luminaire. Vertical illuminances at eye height (5 feet above grade) will give values that can be used to verify compliance by comparing actual site conditions to the photometric plan submitted during review.

**TOWN OF BON ACCORD  
BYLAW 2015-07  
LIGHT EFFICIENT COMMUNITY STANDARDS BYLAW**

Note that the MLO specifies 'total initial luminaire lumens' as a measurement in addition to footcandles/lux. The footcandle (lux) is equal to one lumen per square metre. Lux is the metric unit and is equal to one lumen per square metre.

**SECTION 16 - EXAMPLE OF THE RESIDENTIAL METHOD**

Most residential lighting has traditionally used incandescent lamps which are identified by their wattage. However, since new technologies provide more light for fewer watts, it is no longer possible to regulate residential lighting solely by providing a maximum wattage. Table G, therefore, lists maximum initial luminaire lumens only. In this example, five different luminaires are used on a residential property. Each luminaire must comply to meet the requirements. The site plan following shows luminaire types followed by a tabulation of each luminaire, whether or not it is fully shielded lamp type, and initial luminaire lumens. If the luminaire lumens are not known, multiply the initial lamp lumens by the luminaire efficiency. If the efficiency is not known, multiply the initial lamp lumens by 0.7 as a reasonable assumption. The maximum allowable lumen values come from Table G, based on the shielding classification and location on the site. In this case, each luminaire complies with the requirements of Table G.



Output (Lumens)	Power (Watts)		
	Incan	CFL	LED
500	40	8 - 10	9
850	60	13 - 18	12 - 15
1,200	75	18 - 22	15
1,700	100	23 - 28	18

Luminaire Type	Location	Luminaire Description	Fully Shielded	Lamp Type	Initial Lumen Lumens *	Maximum Allowed Initial Luminaire Lumens	Controls	Compliant
A	Front Entry	Decorative wall sconce	No	9W CFL	420	420	None	Yes
B	Garage Door	Fully shielded wall pack	Yes	23W CFL	1050	1260	Motion Sensor	Yes

**TOWN OF BON ACCORD  
BYLAW 2015-07  
LIGHT EFFICIENT COMMUNITY STANDARDS BYLAW**

C	Back Entry	Decorative wall sconce	No	7W CFL	280	315	Motion Sensor	Yes
D	Shed Entry	Fully shielded wall pack	Yes	40W INC	343	1260	Motion Sensor	Yes
E	Driveway	Fully shielded post top	Yes	13W CFL	1260	1260	None	Yes

\*Initial Luminaire Lumens are calculated by multiplying the total initial lamp lumens by the luminaire efficiency. If the luminaire efficiency is not known, assume an efficiency of 70%.

**SECTION 17 - CONVERSION OF UNITS**

Where a measurement is provided in both imperial and metric units, and the two measurements do not correspond precisely, the metric measurement shall take precedence for purposes of interpretation of this bylaw.

**SECTION 18 - COMPLIANCE WITH OTHER LEGISLATION**

Compliance with the requirements of this bylaw does not exempt a person, company, or organization from:

1. The requirements of any federal, Provincial, or municipal legislation;
2. Complying with any easement, covenant, agreement, or contract affecting development.

**SECTION 19 – EFFECTIVE DATE**

This Bylaw comes into force on the final passing thereof.

**TOWN OF BON ACCORD  
BYLAW 2015-07  
LIGHT EFFICIENT COMMUNITY STANDARDS BYLAW**

**SCHEDULE A**

**VIOLATIONS AND PENALTIES**

The purpose of this *Bylaw* is educational, not punitive. There are, however, certain practices that will promote compliance with lighting regulations. Education is a key tool in promoting compliance. Proactive enforcement procedures will include providing a copy of the lighting regulations to every contractor at the time they consult the Town of Bon Accord to obtain a building permit. Another effective tool is a requirement that the builder or developer acknowledge in writing that the he or she is familiar with the lighting requirements and shall submit a lighting plan for approval. Submission of the Lighting Plan shall be required as a precondition to approval of any development undertaken in the Town's corporate limits or authority. The submitted Lighting Plan shall include the location and BUG rating for each luminaire, specify whether compliance is by the performance or prescriptive method, and a worksheet to show that the luminaires and their BUG ratings are compliant. The following penalties shall apply to all non-compliant landowners:

1. The first disciplinary action shall be a verbal warning by the Development Officer or any of their assignees, along with suggested methods to bring the offending luminaire(s) into compliance with this *Bylaw*.
2. A written warning outlining the non-compliant luminaire as well as methods to bring the luminaire into compliance.
3. If the land owner does not take measure to bring the offending luminaire(s) into compliance with this *Bylaw* within thirty (30) days after issue of written warning by the Development Officer or their assignees, a fine of two hundred and fifty dollars (\$250) shall be issued to each non-compliant premise under the authority of by-law enforcement of the Town of Bon Accord.
4. If the offending luminaire(s) are not replaced or modified to comply with this *Bylaw* thirty (30) days after the issuance of the monetary fine outlined in Section 3. above, the Town of Bon Accord shall be entitled to deactivate the luminaire(s) or replace them at the cost of the holder of the land deed in addition to the monetary fine issued in Section 3.

**TOWN OF BON ACCORD  
BYLAW 2015-07  
LIGHT EFFICIENT COMMUNITY STANDARDS BYLAW**

READ A FIRST TIME THIS 3<sup>rd</sup> DAY OF MARCH, 2015.

\_\_\_\_\_  
Mayor Randolph Boyd

\_\_\_\_\_  
Acting Chief Administrative Officer Patrick Earl

READ A SECOND TIME THIS 17<sup>th</sup> DAY OF MARCH, 2015.

\_\_\_\_\_  
Mayor Randolph Boyd

\_\_\_\_\_  
Acting Chief Administrative Officer Patrick Earl

READ A THIRD TIME THIS 21<sup>st</sup> DAY OF APRIL, 2015.

\_\_\_\_\_  
Mayor Randolph Boyd

\_\_\_\_\_  
Acting Chief Administrative Officer Patrick Earl



Town of  
**Bon Accord**  
building for tomorrow

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