



## Case Study 8: Stewart Creek Golf and Country Club at Three Sisters Mountain Village ~ Greening the Greens

### The Organization

With an unparalleled mountain setting and a spectacular 7,195 yard tournament design, The Stewart Creek Golf and Country Club (SCGCC) opened to great acclaim in 2000. Early reviews called it “truly memorable,” “one of Canada’s best,” and “an outstanding golf course in Canada’s premier area.” Five years later, it can brag about its consistent 4.5 star rating by Golf Digest and its booming popularity: its 18 holes support between 21,000 and 23,000 rounds of golf from opening day in mid-May to closing day after Thanksgiving.

Marketing the course, maintaining it, and providing first class service is a major undertaking. At the height of the season, the operation requires 68 to 70 staff. Managed under one business plan, responsibilities are spread across five departments: Golf Operations, Finance and Business, Pro Shop, and Maintenance. The key positions are the Vice President Golf Operations, Head Golf Professional, Clubhouse Manager, Executive Chef, and Superintendent.

Aside from being one of the better courses in Canada, Stewart Creek is also part of the biggest land development in the Bow Valley, which means it has also been one of the most closely scrutinized courses in Canada with regard to environmental practices. Where golfers point to Stewart Creek’s beauty and “fair test” design, local environmentalists point to the challenges of building and operating a golf course in a narrow mountain valley that includes a regionally-rare ecosystem, is part of an internationally significant wildlife migration corridor for wilderness emblems like grizzlies, wolves, and cougars; and is experiencing very rapid human growth, much of it by people who highly value the area’s natural amenities and demand ready access to a multi-active, year-round mountain lifestyle. “From the beginning,” says Sean Kjemhus, the course superintendent, “our challenge has been to build a great course that minimizes impact on the environment, including the valley’s wildlife, and we’ve been watched every step of the way.”

Stewart Creek is a part of Three Sisters Mountain Village (TSMV), a 3,000 acre development that spreads across an old



coal mining property. After nearly a century of continuous production – most of it from underground excavation but also with some surface mining that involved extensive clearing – the mines closed in 1979. Permission to develop the property as a resort was granted in 1992, following wide-ranging public hearings by the Alberta Natural Resources Conservation Board (NRCB). The intervening years have seen several changes of owners and several planning iterations, but a mix of residential, recreational, resort, and commercial development – with golf as a centrepiece – has been the development goal throughout. Its current owner, Three Sisters Mountain Village Ltd. (TSMV), is working to shape the development as a destination health, wellness and adventure resort within the next 10 to 15 years.

To be successful in a community with strong environmental values and a vocal core of environmental advocates, Three Sisters realized early on that its development would require something more than industry-standard practices. Despite the fact that over 70 percent of the original property will ultimately be left undeveloped – an amount that exceeds the 50 percent thresholds cited by planners for “conservation subdivision

design”<sup>1</sup> – Three Sisters has been a source of community controversy for nearly 15 years. Long time residents, used to having ready (albeit unauthorized) access to the property for hiking, biking, horse-back riding and nature study, have always had proprietary feelings about the old mine lands, and newcomers have been quick to make demands regarding their own recreational desires. Trying to walk the line between developing their property to the satisfaction of their shareholders and developing social capital within the community has been a difficult balancing act, and TSMV managers point to a long string of “non-standard development practices” they have pursued, not only to comply with the NRCB Decision Report and municipal regulations and policies, but to find common ground and acceptance in the community.

For their part, the Stewart Creek Golf Course managers have pursued a multi-pronged strategy that includes preserving the local history, designing and constructing the course to minimize its impact on the montane ecosystem, and operating the course with the best available environmental knowledge and technology.

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<sup>1</sup> Randall Arendt, one of North America’s best known conservation planners, has set the minimum percentage of land that should be designated as permanent open space for a conservation subdivision at 50 percent. “Growing Greener: Conservation Subdivision Design,” Planning Commissions Journal 33, Winter 1999.



Regarding the cultural history of the area, TSMV has devoted considerable time and resources to preserving the history of the community's mines. At Stewart Creek that has meant turning some of the old mines into golf course features by blocking off their shafts but keeping the entrances as rain shelters.

To help mitigate ecosystem and wildlife impacts, Gary Browning, a Calgary-based golf course architect with a Master's degree in environmental design, was hired to design the course. Browning has a good reputation for designing "natural" golf courses that minimize the disruption of the natural site while maximizing site qualities such as terrain, trees, water, and views. Because Stewart Creek was constructed as a brand new course, Browning was able to incorporate state of the art planning for water retention and drainage, use appropriate turf seed, and make extensive use of natural landscape features. "Our basic philosophy," says Browning, "was to honour the pristine area we had been given to work with." Accordingly, he routed the course close to the contours of the terrain, employed existing surface and subsurface features to capture water run-off that could be used and re-used for irrigation, and selectively cleared each fairway with the needs of wildlife in mind. "We hand-flagged both the trees to be cut and the trees to be left standing, and we didn't cut any more than we absolutely had to. We

left substantial plots of native vegetation between the fairways to provide cover and security for wildlife. And we identified the area's outstanding natural features and then designed the course around them. For example, the course weaves itself around a significant stand of old Douglas fir, a natural salt lick, and a mineral lick associated with some of the old surface mining. The result is not only a great round of golf, but a great walk in the mountains."

In terms of day-to-day environmental management, Kjemhus and TSMV have worked with the Audubon Cooperative Sanctuary System (ACSS)<sup>2</sup> to certify the course at the bronze level in Environmental Planning. In 2004, Kjemhus won an Environment Leaders in Golf award in the international category by the Golf Course Superintendents Association of America and Golf Digest magazine, as well a 2004 Excellence in Government Relations award.

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<sup>2</sup> Not to be confused with the Audubon Society of birding fame, Audubon International, through its Cooperative Sanctuary System, promotes comprehensive environmental management, enhancement and protection of existing wildlife habitats, and recognition for those who are engaged in environmentally-responsible golf course projects. There are nine Audubon certified courses in Alberta, and Kjemhus is one of 9 Canadian stewards for the program itself, providing advice to and sharing his experience with other golf courses.



## The Natural Step to a Sustainable Canmore

Three Sisters Mountain Village learned about The Natural Step to a Sustainable Canmore at a time the company was hosting public workshops intended to resolve questions regarding wildlife corridors and recreational access on Three Sisters property. In the spirit of mutual exploration, the Three Sisters management agreed not only to have the company become an Early Adopter, but to become a financial partner as well. The company then decided to use Stewart Creek's Turf and Environmental Care Program as a pilot project for the program, reasoning the turf program was a manageable bite of the bigger development. Further, if the pilot went well, they could consider it as a potential model for future TSMV projects as well as share what was learned with the golf course industry as a whole.

Participating in the Natural Step training also presented an opportunity to showcase Stewart Creek's existing stewardship initiatives; to take its environmental commitment to the next level; and to explore the possibilities of "doing well by doing good." As Greg Andrew, Vice President of Golf Operations, stated, "Knowing the right thing to do, and knowing how to do it is not the same thing as knowing how to do it so it makes

sense economically. We knew The Natural Step Framework has been a useful in helping businesses apply triple bottom line accounting - economic, social and environmental - and we had hopes it would help us in that regard, too." Beyond those possibilities, however, becoming an Early Adopter presented a community leadership role and, as Andrew noted, "Every time we've been presented with such an opportunity we've taken the step forward."

TSMV appointed three representatives to attend The Natural Step training: Greg Andrew, Sean Kjemhus, and James Scott, Manager of Planning for TSMV. All three were good candidates, in part because they had been drawn to TSMV because of what they saw as its progressive and environmentally-conscientious approach to development. From the beginning, Kjemhus explains, Three Sisters has recognized the importance of protecting the biggest selling feature of the development and the Stewart Creek course - "those breathtaking panoramas that fill each golfer with wonder and awe."

### Baseline Evaluation, Sustainable Practices

Kjemhus, through his experience with other programs like the Audubon Cooperative Sanctuary System, was already familiar with many sustainability concepts, and he found it relatively easy



to work through the baseline evaluation. As he suspected, the evaluation highlighted a number of existing practices the course could take pride in. They included:

- state of the art golf course design and construction;
- a recycling program for waste oil and coolant for all golf course vehicles;
- the use of electric golf carts;
- an integrated pest management program;
- water management techniques that emphasize run-off capture and re-use;
- equitable employment for 80 part-time and 12 year-round staff
- providing recreation and leisure for the community and its visitors, with between 21,000 and 23,000 rounds of golf a season.
- sponsoring community events, including Mozart on the Mountain and Art on the Mountain;
- generating dividends for shareholders; and
- paying taxes to federal, provincial and municipal governments.

Kjemhus, Andrew and Scott found the baseline analysis both informative and thought-provoking. As Andrew reported, "it brought us up to speed on the environmental programs and stewardship activities Sean and his turf team have been working on since construction began in 1998. Beyond that, it made me really think about the whole picture, and what shows up when you break a system down into component pieces. It's like looking at the parts of battery and discovering which pieces are toxic and don't biodegrade, and thinking about what can be done about them. It makes you reconsider our throw away society."

For Scott, the baseline analysis was "a good education" about the golf course's environmental care program. "I learned all sorts of things I didn't know before; about integrated pest management, about the challenges that high altitude and a short growing season create for turf management and how to overcome them, and about the course's involvement in the Audubon International Cooperative Sanctuary Program. It also made me think about some of the environmental practices in my own life and how I could improve them."

For Kjemhus, participation in the Natural Step provided a new perspective: "I learned that what we've done and are doing as part of our daily routine isn't widely known or appreciated for its



environmental value. We need to get the word out.”

## Baseline Evaluation, Non-Sustainable Practices

The baseline evaluation revealed a number of sustainability challenges for the Turf Management and Environmental Care Program. The team organized their analysis around six aspects of turf management – irrigation, fertilizer management, pest control, turf mowing, equipment operations, and maintaining turf grass. This helped them pinpoint their unsustainable activities, including which materials they were using, and how they were using them. (Appendix A)

### **1) Contributions to systematic increases of substances taken from the earth’s crust**

Fossil fuels are used in maintenance machinery and vehicles belonging to the golf course, and in the vehicles delivering materials from various suppliers.

### **2) Contributions to systematic increases in concentrations of substances created by society**

a) Stewart Creek’s largest source of pollution is the fossil fuel emissions generated by their own activities and those of their suppliers and their customers.

b) A second source is the fertilizer and pesticide present in run-off, or as leachate from activities relating to grass fertility and pest management.

c) In addition, the turf care products arrive from the suppliers in non-recyclable plastic that constitutes a persistent pollutant to the environment.

### **3) Contributions to the degradation of nature**

a) The high quality organic fertilizers Stewart Creek uses are less polluting than their synthetic counterparts, but through run-off they still contribute to algae growth in adjacent water bodies.

b) Large quantities of sand were trucked in for construction of the golf course’s subsurface drainage structure, as well as for the sand traps featured throughout the course.

c) Many of the products used in the turf management program are packaged in plastic destined for the landfill.

### **4) Contributions to conditions that undermine people’s ability to meet their needs**

The Stewart Creek Early Adopter team noted the public perception that golf courses, including Stewart Creek, are water intensive and water-polluting



operations. Given the work they have put into water conservation, both in the course design and in their operational practices, the men feel this is largely a misperception. The golf course consistently uses less water than is permitted under its water license and the managers are very cautious in the quantity and quality of fertilizers used.

### **Sustainability Vision**

The original TSMV focus for the Early Adopter training was the Turf Management and Environmental Care Program. However, as the training progressed, Scott and Andrew began to see how The Natural Step Framework could be applied to all aspects of the golf course operation and, potentially, to other aspects of the greater TSMV development. (Appendix B). Their vision statement (Appendix C) reveals the broadening of focus. As a sustainable organization, the vision reads, Stewart Creek Golf and Country Club will "Deliver a memorable experience that extends beyond golf through environmental responsibility and financially sustainable management practices based on innovation and continuous learning in an environmentally conscious framework."

As part of the vision, the team created a list of attributes that would characterise a sustainable operation (Appendix C). Included among them were an ongoing

search for innovative technologies and practices that would result in continual sustainability improvement. One specific goal was to derive 90 percent of their energy from renewable sources.

### **Action Plan**

All of the Early Adopters were asked to come up with list of innovations that would lead them towards a sustainable future and, from these, create an action plan that lists short, mid and long range actions. The team developed a list of over 20 innovations and an action plan specific to the turf management program, as well as a list of recommendations that could be applied to the entire golf course operation. The action plan (Appendix D), includes a range of activities from increasing water recycling and experimenting with biodiesel to using solar electric equipment and re-using organic waste.

### **Implementation**

Since completing the Early Adopter training, the Stewart Creek Golf and Country Club has been very active in implementing its action plan.

- Grass clippings from the freeways are being collected and hauled to the municipal landfill for composting. Eventually, the compost will be made available to consumers for gardening. The managers want to set up their



own composting facility for the course, but are proceeding cautiously: grass clippings are a wildlife attractant and can be the source of human-wildlife conflict when not properly managed.

- Biodiesel is being studied as a possible fuel for the course's power mowers. On the basis of the initial research, the managers have decided to wait until there is an adequate quantity of bio-diesel from a quality control supplier available before buying any new equipment.
- Each capital purchase is being analyzed through a Natural Step sustainability lens.
- The managers are working with their suppliers to reduce the number of deliveries. In the past, ordering and subsequent delivery was done piece-meal, with deliveries arriving one and two boxes at time. The new approach involves submitting bulk orders for the entire season and asking the supplier to deliver everything at once. The result is fewer vehicle trips, fewer person-hours to enter the goods into the accounting and sales systems, and reduced operated costs.

In implementing their action plan, the team has encountered the trade-offs that are part and parcel of sustainability planning. Ideally, the course maintenance

facility would be large enough to store a year's supply of turf care products, eliminating the need for multiple deliveries. Similarly, the best location would be central to the golf operations, which for TSMV meant mid-way between the Stewart Creek course and a second approved TSMV course to be built to the east of Stewart Creek. TSMV, however, was not granted a permit for the "ideal" maintenance facility because of its proximity to a wildlife corridor. Accordingly, changes had to be made both to the size and location of the facility. In the opinion of TSMV the trade-off decision was unfortunate since it limited future operational and environmental efficiencies.

## Last Words

All three members of the Early Adopter team have expressed frustration with the perception by some Canmore citizens that golf is inherently unsustainable. As Kjemhus notes, "in the local media, it seems any understanding of what is happening with golf courses is pre-conditioned by the idea that golf courses are big, bad, and ugly. In fact, we're proving every day that golf courses can be environmentally sustainable, and there is no doubt at all that golf courses provide economic and social benefits for the community."



“The truth is that we’re trying to make a difference,” he says, “and The Natural Step seemed to be a good tool to help us make that difference. Aside from the content of the program, it has provided a way for the company to showcase what it has been doing through the lens of a credible third party.”

Within the golfing community, Stewart Creek is considered not only a premier player’s course, but a leader in environmental management practices, and the team is hopeful their participation in The Natural Step will help them get the word out to a wider audience. To that end, they are eager to work with the new Bow Valley Sustainability Hub to develop mechanisms that will encourage best practices among other golf courses. All three participants would welcome opportunities to act as consultants to other golf courses about the Natural Step and golf industry sustainability.

They would also like to see the municipality play a major role in supporting the on-going sustainability work. “Fanning the fire” that the Early Adopter program sparked, and “show-casing the work done by all members of the community,” they say, will lend credibility to everyone’s work and speed the community’s progress toward a sustainable future.

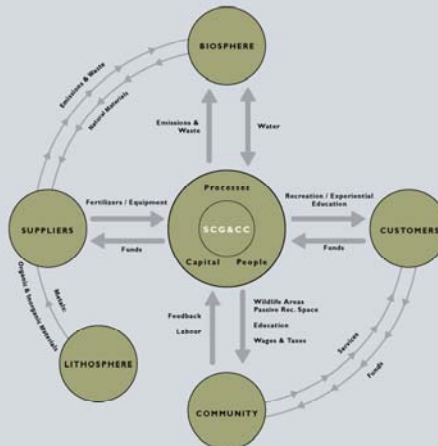
## SCGCC Appendix A: Baseline Analysis

### Baseline Analysis / Present Reality

#### Major Inputs and Outputs Analysis

MAJOR INPUTS	STAGE NAME	MAJOR OUTPUTS
Water, Plastics/PVC, Energy, Metals	IRRIGATION	Emission Water, Runoff, Erosion, Algae
Energy, Chemicals (Nutrients), Fossil Fuels, Metals	FERTILITY MANAGEMENT	Runoff (Leachates), Packaging Emissions
Energy, Chemicals (Nutrients), Fossil Fuels, Metals, Pests	PEST CONTROL	Emissions, Pest Eradication
Fossil Fuels, Metals	TURF MOWING	Recycled Grass (Clippings), Organic Waste (Clippings), Emissions, Metals
Oils, Fuels, Metals, Energy, Packaging, Water	EQUIPMENT OPERATIONS	Emissions, Waste Oil, Filters, Metals
Labour/Energy/Fossil	MAINTAINED TURFGRASS	Turfgrass/ Customer Satisfaction

#### System Map: Current Reality



#### The Four System Conditions of the Natural Step Framework

*In the sustainable society, nature is not subject to systematically increasing:*

- SC 1. Concentrations of substances extracted from the Earth's crust.
- SC 2. Concentrations of substances produced by society.
- SC 3. Degradation by physical means and, in that society. ...
- SC 4. People are not subject to conditions that systematically undermine their capacity to meet their needs.

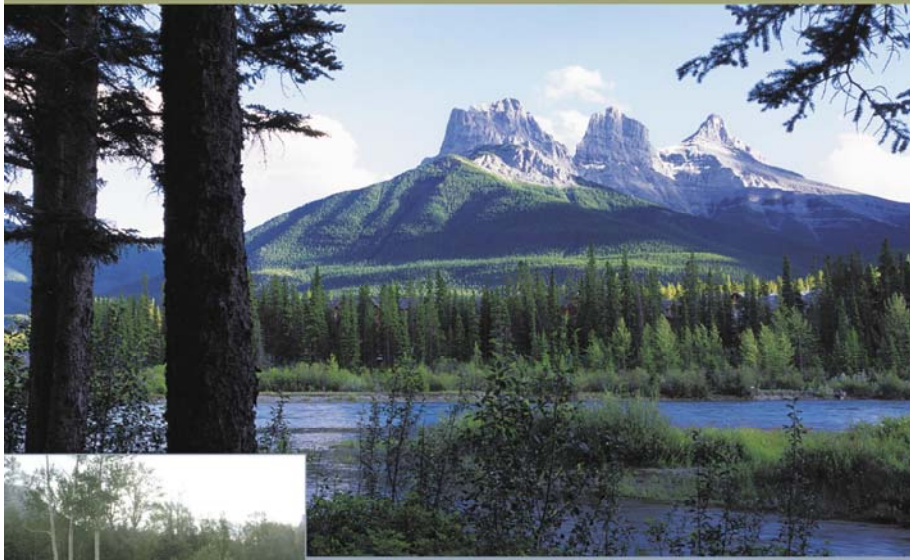
#### System Conditions Analysis

SC 1	SC 2	SC 3	SC 4
<b>POSITIVE EFFECTS</b> <ul style="list-style-type: none"> <li>• Waste Oil Recycling</li> </ul> <b>NEGATIVE EFFECTS</b> <ul style="list-style-type: none"> <li>• Fossil Fuels</li> <li>• Metals</li> <li>• Sand</li> </ul>	<b>NEGATIVE EFFECTS</b> <ul style="list-style-type: none"> <li>• Emission</li> <li>• Packaging</li> <li>• Discarded Metals</li> <li>• Synthetic Chemicals</li> <li>• Leachate/Runoff</li> </ul> <b>POSITIVE EFFECTS</b> <ul style="list-style-type: none"> <li>• Plastics Recycling</li> <li>• Coolant Recycling</li> </ul>	<b>NEGATIVE EFFECTS</b> <ul style="list-style-type: none"> <li>• Landfill Space</li> <li>• Extraction of Lithosphere Materials (SC 1)</li> <li>• Hydro Energy</li> </ul> <b>POSITIVE EFFECTS</b> <ul style="list-style-type: none"> <li>• Integrated Pest Management techniques</li> <li>• Water Management techniques</li> </ul>	<b>NEGATIVE EFFECTS</b> <ul style="list-style-type: none"> <li>• Runoff (perception)</li> <li>• Water Consumption (perception)</li> </ul> <b>POSITIVE EFFECTS</b> <ul style="list-style-type: none"> <li>• Taxes</li> <li>• Employee Wages</li> <li>• Forum for charitable events</li> <li>• Recreation / Health</li> <li>• Leisure Experience</li> <li>• Passive Recreation Opportunities</li> <li>• Dividends</li> </ul>



## SCGCC Appendix B: Opportunities for Innovation

### Sustainability Challenges & Opportunities



#### Challenges & Opportunities

- Perception of golf courses as inherently unsustainable
- Application of the Natural Step Framework to the turf maintenance processes at the Stewart Creek Golf & Country Club as a learning platform for Three Sisters Mountain Village
- Evaluate potential for a broader application of the Natural Step Framework
- Creates interesting challenges and opportunities for further applications of the Natural Step Framework



Stewart Creek Golf & Country Club  
Early Adopter: Turf and Environmental Care Program



## SCGCC Appendix C: Sustainability Vision

### Sustainability Vision

"Deliver a memorable experience that extends beyond golf through environmental responsibility and financially sustainable management practices based on innovation and continuous learning in an environmentally conscious framework."

*Vision of the Stewart Creek Golf and Country Club in a sustainable future based on application of the Natural Step Framework through the Early Adopter process.*



### Characteristics in a sustainable future

*Recommendations from the Natural Step Early Adopter process:*



- work with suppliers to ensure sustainability is a part of the way we do business
- educate and empower staff on the sustainability vision and principles: teach staff to become ambassadors for a sustainable approach (sustainable financially and environmentally)
- educate customers and the general public about sustainable practices and initiatives used in golf course management
- continue to evaluate opportunities for innovation in technology and practices
- highly efficient in the use of energy, water and materials
- seek opportunities to reduce use of chemical products in pest management and fertility
- eliminate grass clippings from the waste stream
- recognize the community and contribute back to the community through special events and day-to-day practices
- continue to meet or exceed environmental management and monitoring requirements
- derive 90% of energy consumption from renewable resources



Stewart Creek Golf & Country Club  
Early Adopter: Turf and Environmental Care Program



## SCGCC Appendix D: Sustainability Action Plan

### Sustainability Action Plan



#### Recommendations from the Natural Step Early Adopter process:

##### Short Term

- Increase water recycling
- Recycle all packaging
- Wildlife education
- Bio-diesel seminars & experimentation

##### Medium Term

- Share knowledge / best practices (internet)
- Composting organic waste

##### Medium to Long Term

- 4-stroke engine replacement experimentation schedule (integrated with Bio-diesel & Solar applications research)
- Research and Development "platform" for: pest management (IPM), equipment and operations, wildlife interface, fertility

##### Long Term

- Continue organic fertilizer use
- Electric equipment (Solar electric equipment)
- Re-use of organic waste
- Centrally controlled computer irrigation system
- Supply-chain intervention



Stewart Creek Golf & Country Club  
Early Adopter: Turf and Environmental Care Program

