

Executive Summary

The concept of forming a Task Force to help define the future of Brannon Gearhart Park (BGP) was a result of conversations among a number of long-time residents who had become concerned about the continued degradation of the Park. The group approached the Ken Caryl Ranch Master Association (KCRMA) Board in September 2019 and at the October 2019 Board meeting a motion to form the BGP Task Force was unanimously approved.

Brannon Gearhart Park Study Area

The Roles and Responsibilities of the BGP Task Force are to:

- Evaluate the condition of the following five areas within the park:
 1. Existing parking lot, trails, and walkways.
 2. Existing picnic tables and benches.
 3. The pond and its immediate surroundings.
 4. The playground and surrounding area.
 5. The open space, which is defined as all wetlands, grasslands, trees, shrubs, and rock outcroppings.
- Recommend the future use of the areas defined above.
- Develop Cost Estimates for all proposed new construction, repair, relocation and/or removal activities.
- Issue a Final Report containing all findings and recommendations on or before August 1, 2020.

It is important to note that the Task Force has no financial authority nor can it commit the KCRMA Board to any expenditures. Additionally, no actions or implementation of any recommendations may be taken without approval of the KCRMA Board of Directors.

There were three non – voting Stakeholders that participated in the evaluation process and provided recommendations made in this report:

1. KCR Firewise Board
2. KCR Equestrian Center
3. Bradford North and South Schools

Over a period of seven months, the Task Force met to discuss each of the five study areas, contacted vendors for pricing information, and contracted with an environmental services firm to determine pond

water quality and test for sediment contamination. The later analysis was conducted since it has a direct bearing on what options could be available to dispose/relocate the sediment if the pond were to be dredged.

The Task Force evaluated the Pros and Cons of a variety of activities and used that process to define a series of recommendations for each of the five study areas. Where appropriate it developed cost estimates and provided some options for the Board to consider.

It is important to recognize that the three non-voting stakeholders as well as the individual task force members analyzing a specific area within the park made their recommendations based upon their particular interests and areas of expertise. As a result, a particular report recommendation could be in direct conflict with another. For example, from a Firewise perspective, to mitigate the impact of a fire, removing fuel sources within the park would be ideal. However, from a biology teachers' viewpoint, fallen tree limbs provide excellent habitat for the various bugs that support wildlife within the park. It is also important to recognize that some of the recommendations made could be in conflict with the views of other groups within the Ken Caryl community such as Open Space, Trails, Conservation Club, and the Historical Society.

The Task Force does not believe that it should be the arbitrator and decide which recommendation has more value than the other; that is the responsibility of the KCRMA Board. As a result, we have presented the recommendations made by all of the Stakeholders and Task Force members "unedited". We have however identified potential conflict areas to assist the Board in its decision-making process. Provided below are the various recommendations:

<i>Based upon input received from the Firewise Committee the following recommendations are made:</i>	
1.	<i>The grassland area immediately east of the Valley Parkway should be mowed approximately 40 feet beyond the current irrigated grass area. It should be mowed to a height of approximately 4 inches at least three times during the summer season.</i>
2.	<i>Where feasible other fuel sources, primarily dead trees and shrubs should be reduced/eliminated throughout the park.</i>
3.	<i>The 38 homes adjacent to BGP study area should be notified of the fire hazards and asked to eliminate as many nearby fuel sources as possible. Where feasible they should be allowed to mow up to 20 feet into the park from their property boundary. This extends the current mowing area by 10 feet. The current prohibition against cutting bushes with branches over 1 inch should remain. However certain exemptions may be granted on a case by case basis.</i>
4.	<i>The KCRMA Board should request an opinion from its current Insurance Agent regarding the potential for premium and deductible increases. Reserves should be increased accordingly.</i>
5.	<i>West Metro Fire should be contacted to see what if any modifications can/should be made to allow better access to BGP, particularly the area south of the red rock outcropping.</i>
<i>Estimated Costs: Nominal. Associated with expanded mowing near Valley Parkway (See Section: 2.1)</i>	
<i>Other Perspectives to Consider: Open Space and KCRMD (expanded mowing near Valley Parkway); Bradford Schools (removing habitat)</i>	

Based upon input received from the Equestrian Representative the following recommendations are made:	
1.	<i>The turnpike portion of the path that begins at the northern corner of the red rocks and travels through BGP to the Valley Parkway be expanded to facilitate equestrian usage and no further additions to accommodate mountain bikes should be added along that path (i.e. jumps etc.).</i>
2.	<i>All future modifications intended to address erosion concerns should be made with equestrian usage in mind.</i>
3.	<i>If the playground area is expanded, it should be limited to the east and south.</i>
	Estimated Costs: \$2,000 Assumed labor would be provided by volunteers (See Sections: 2.2 and 6.0)
	Other Perspectives to Consider: Trails Club and Mountain Bike Club (rebuilding/expanding turnpike)

Based upon input received from Bradford North & South Schools the following recommendations are made:	
1.	<i>Place signs similar to those at the Bradford Perley House in a few selected areas within the park noting historical and geologic areas of importance.</i>
2.	<i>Place birdhouses designed and built by the students throughout the park. Ideally this would be done with assistance from residents who are active in the Audubon Society.</i>
3.	<i>Design and build “bug hotels” and place them in selected areas in the park (e.g. near the pond).</i>
4.	<i>Establish areas along Massey Draw Creek and the pond that the students could use to more easily/safely take water samples and flow measurements.</i>
5.	<i>Place wildlife cameras in selected areas in the park and throughout the Valley. Areas would be identified with input from Open Space, the Conservation Club and other interested groups.</i>
6.	<i>Support the school so that it can achieve a National Wildlife Federation Schoolyard Habitats® certification.</i>
	Estimated Costs: \$1,000 to \$5,000. Potential Cost Sharing with Sponsors of Bradford Schools (See Sections: 2.3, 3.3 and 5.3)
	Other Perspectives to Consider: Historical Society (signage), Firewise (fuels), Trails Club and Conservation Club (footpath to pond)

The Task Force recommends the following actions be taken at the playground (See Section 3.0)		
1.	Repair and Upgrade the existing playground area.	<i>The equipment is over 25 years old and in need of repair. It is primarily geared towards toddlers and younger children. Most of the equipment is extremely hot to the touch and shade should be provided. There is ample space in the center of the existing area to add a new piece of equipment.</i>
	Estimated Costs: \$39,692	

2.	Expand the playground approximately 35 feet to the east.	Purchase new equipment geared towards older children with a focus on physical fitness. The area should include a (small) climbing wall and other strength and balance equipment. Relocate one of two the picnic tables currently on the eastern edge of the park (near the old playground area) and provide shade.
	Estimated Costs: \$37,093	
3.	Expand the playground to the south between the existing picnic tables.	This area should be made with natural materials and a few pieces of manufactured equipment. It is envisioned that this would be an Eagle Scout Project and that all of the natural material would be obtained from KCRMA maintenance activities (i.e. tree removal etc.). Finally, it is envisioned that a natural footpath to the pond be established. Also a porta-potty similar to the one near the Bradford Pearly House be located nearby Note: A majority of members believed a porta-potty should be located here. Others felt it should be placed in the parking lot area.
	Estimated Costs: \$18,360	
Other Perspectives to Consider: Equestrian and Open Space Committee		(Expansion) Trails and Conservation Clubs (footpath to pond) & neighborhood issues with a porta-potty

The Task Force recommends the following actions be taken at the pond (See Section 4.0)		
1.	Dredge the pond.	The pond was created in the 1950's to support ranching operations. The average depth is approximately 2.5 feet and over the past six years an aeration system has been installed. It has been treated with microbes during the summer months. Despite these efforts the pond's total dissolved oxygen level is low and as a result of this and other factors it is covered by algae most of the year. Furthermore, cattails are encroaching the pond from many of its banks and if left unchecked will completely consume it in a few years. EcoResource Solutions Inc., a firm engaged by the Task Force recommends that the pond be dredged.
	Estimated Costs: \$23,820 Includes: Mobilization, Erosion Control, dredging, onsite sediment placement, hydroseeding, and trail repair. See Section 4.4.2	
2.	Place the sediment on-site and hydroseed the disturbed areas.	The sediment was tested by EcoResource Solutions Inc. and found to contain low levels of naturally occurring heavy metals. Phosphorus, nitrogen etc. levels were high as expected. While further study is suggested at this point in time due to the wide discrepancy between on-site vs. off-site disposal costs it is recommended that the sediment be placed on-site and hydroseeded.
	Estimated Costs: Included above	

		<i>(Note: Offsite disposal costs range between \$40,000 and \$70,000. One member of the Task Force believes the material should be moved off-site regardless of cost differential. See Section 4.4.1).</i>
3.	Repair the inlet channel, and the inlet & outlet structures.	A precast concrete elbow should be installed to capture water from Massey Draw Creek during high storm/snow runoff events. The existing inlet & outlet structures need basic concrete repair due to erosion.
	Estimated Costs: \$4,090	
	Other Perspectives to Consider regarding sediment placement:	Open Space Committee and the Conservation Club

The Task Force recommends the following actions be taken within the open space and drainage areas.		
1.	Plant "shadow trees"	Within the study area there are six ash trees that at some point in time will be threatened by the emerald ash borer disease. Annual treatment would be required and therefore, very expensive. To mitigate their loss six small trees should be planted near (within the shadow of) the existing ash trees. It is recommended that Bradford students in conjunction with arborists, evaluate which types of substitute trees should be utilized and once the selection has been agreed upon by KCRMA, plant them with the aid of KCRMA staff.
	Estimated Costs: \$500	
2.	Plant native flowering plants near parking lot	Rather than attempt to plant and water conventional garden flowers in the Park, staff-supervised volunteers (ideally school students) should plant several dozen native flowering plants along the recently disturbed border of the concrete trail near the parking lot. These plants should be identified by the students and require low amounts of water.
	Estimated Costs: \$250	
3.	Evaluate Groundwater and Surface water drainage issues	Over the past 25 years there has been a reduction in the amount of water flowing in Massey Draw Creek. Also, the number of cattails in the park has expanded and a number of drought tolerant trees have died. This appears to be the result of groundwater being channeled by the sanitary sewer lines throughout the park. An engineering firm should investigate groundwater flows and locate pockets of groundwater which might be tapped to drain into the channel of Massey Draw Creek above the fishing pond.
	Estimated Costs: \$10,000 to \$20,000	
	Other Perspectives to Consider: Firewise (adding fuel sources)	

<i>The Task Force recommends the following actions be taken with respect to the parking lot, trails, walkways picnic tables, and benches.</i>		
1.	<i>Trails</i>	<i>a. The vehicle access trail from Willowleaf drive to the pond area should be paved. b The turnpike should be widened to address equestrian concerns. c. The vehicle access trail on the southern edge of the red rock outcropping is in need of repair.</i>
	<i>Estimated Cost Range: \$65,000 to \$80,000</i>	
2.	<i>Picnic Tables</i>	<i>One of the two tables located at the site of the old playground area should be relocated and placed near the expanded playground area.</i>
	<i>Estimated Costs: Nominal presumed to be done by KCR crew</i>	
3.	<i>Benches</i>	<i>The memorial bench should be better maintained, and relocated near the pond.</i>
	<i>Estimated Costs: Nominal presumed to be done by KCR crew</i>	
4.	<i>Parking lot</i>	<i>Consider adding a porta-potty</i>
	<i>Other Perspectives to Consider: Trail Club (expanding turnpike).</i>	<i>Neighborhood concerns with adding a porta-potty</i>

1.0 Introduction

1.1 Background

The concept of forming a Task Force to help define the future of Brannon Gearhart Park (BGP) was a result of conversations among a number of long-time residents who had become concerned about the continued degradation of the park. Approximately thirty years ago BGP consisted of many more amenities. It contained two playground areas, many picnic tables, some with raised charcoal grills. The sidewalk and picnic areas were frequently mowed, including the grass areas on the banked areas of the pond. Over time a number of amenities were removed due to budget and fire safety concerns. Additionally, the overall philosophy of how BGP should be maintained changed. As a result, the maintenance footprint was substantially reduced and mowing now occurs only three or four times a year.

One concern is the playground area. It is nearly 30 years old, and is in need of repair. There is little if any shade and the equipment is geared towards toddlers and very young children. The equipment is very hot to the touch especially in the summertime. There are no nearby restroom facilities, and the wood chips that serve as a fall protection system needs to be refreshed. There are two picnic tables directly south of the playground area. The grass area between them is typically high and there are a large number of thistle weeds between them. Despite its limitations the area is frequently used.

Another concern is the continued degradation of the pond. In the mid 1990's its depth was in excess of 6 feet and the water clarity was very good. Today due to sedimentation buildup, nitrogen runoff, and lack of a consistent source of surface water, the pond has become an eyesore. Its average depth is estimated to be 2.5 feet and throughout most of the year it is covered with algae. Approximately six years ago an aerator was added to the pond and microbe treatment began. Unfortunately, cattails continue to encroach along its banks and it is only a matter of time before this open water source will be lost to the ducks and other animals that can be found in the pond.

A third concern is the lack of water running through Massey Draw Creek and the diversion of groundwater that has occurred. Massey Draw Creek flowed throughout the springtime and well into the summer months through the late 1980's and mid 1990's. Twenty-five years ago, there were few if any cattails in the central part of the study area. Sanitary sewer lines placed to support residential development west of the Valley Parkway have created channels that have changed the way groundwater flows into and through the park. As a result, certain drought tolerant trees have died and cattails have flourished. Looking into the future, the ash trees in the park will be threatened by the emerald ash-borer and due to high cost of treatment will in all likelihood die in the next 10 to 15 years.

1.2 Task Force Overview and Job Description

In September 2019, the Ken Caryl Ranch Master Association (KCRMA) Board of Directors was approached to determine if they would support the formation of a neighborhood task force to study the existing park infrastructure and make short- and long-term recommendations regarding the park's future. A Task Force Job Description was developed and at the October 2019 KCRMA Board meeting a motion to form the BGP Task Force was unanimously approved.

The key Roles and Responsibilities of the BGP Task Force are to:

- Evaluate the condition of the following areas:

- Existing parking lot, trails, and walkways.
- Existing picnic tables and benches.
- The pond and its immediate surroundings.
- The playground and surrounding area.
- The open space, which is defined as all wetlands, grasslands, trees, shrubs, and rock outcroppings.
- Recommend the future use of the areas defined above.
- Develop Order of Magnitude Cost Estimates for all proposed repair, relocation and/or removal activities.
- Issue a Final Report containing all findings and recommendations on or before August 1, 2020.



It is important to note that the Task Force has no financial authority or any authority to commit the KCRMA Board to any expenditures. Additionally, no actions or implementation of any recommendations may be taken without approval of the KCRMA Board of Directors. For the purposes of this report, BGP is defined as the area depicted in the figure.

1.3 List of Task Force Members and Stakeholders

In November 2019, notices were posted in *Life at Ken Caryl* and in the KCR e-News indicating the intent to form a Task Force. KC residents interested in serving on the Task Force were encouraged to submit an application. Nine residents submitted applications and at the December 2019 KCRMA Board meeting the following six applicants were selected to become voting members.

1. John Fosholt
2. Del Grau
3. Seth Murphy
4. Marketa Murray
5. John Rodell
6. Stephan Verberne

There were a number of non – voting Stakeholders that participated in the BGP evaluation process and provided invaluable insight that helped formulate the recommendations made in this report:

- 1 KCR Firewise Board
- 2 KCR Equestrian Center
- 3 Bradford North and South Schools
- 4 KCRMA Staff Representative
- 5 KCRMA Board Liaison

On 11 February 2020 the first BGP Task Force meeting was held and the following selections were made: John Rodell (Chairman); Stephan Verberne (Vice Chairman); John Fosholt (Secretary). The following Liaisons also participated: KCRMA Staff (Sean Warren); KCR Firewise (Dan Hatlestad); KCR Equestrian (Christina Stovall) and KCRMA Board (Erlinda Stafford). As a result of the 3 March 2020 KCRMA General Election, Dave Seagraves began to serve as the KCRMA Board Liaison. At the request of the Task Force Chairman, Ms. Stafford, who retired from the Board in March 2020, continues to attend the meetings as a member of the General Public. The Task Force Chairman serves as the liaison between the Task Force and Bradford North and South schools.

1.4 Task Force Organization

Since there are four broad areas of BGP to be evaluated it was determined that one Task Force member would take the lead and evaluate a particular area and develop recommendations for its short- and long-term future. The member would then report to the full Task Force receive comments then draft a particular section of the report.

The Task Force Area Leads were:

- *John Fosholt*: Open Space and Drainage
- *Del Grau*: Pond and Immediate Surroundings
- *Marketa Murray*: Playground and Immediate Surroundings
- *Seth Murphy*: Trails, Walkways, Picnics Tables and Benches.

1.5 Process Used in Developing Cost Estimates

As stated in its Job Description, the BGP Task Force is required to provide Cost Estimates for any recommended upgrades and/or change. Since Messer's Grau, Rodell, and Verberne have backgrounds in engineering and construction they helped other Task Force members establish cost estimates for their particular recommendations.

1.6 Meeting Protocols, Transparency and Public Outreach

Throughout the planning process the Task Force was aware that any recommendations considered by the KCRMA Board would need community support. As a result, the Task Force has attempted to be as transparent as possible throughout the planning process. All agendas and meeting minute notes have been posted on the KCMA website, and a presentation to the KCRMA Board was made on 19 May 2020. In the 13 May 2020 edition of *Life at Ken-Caryl* an article provided an update on the Task Force's progress and solicited feedback from the community.

Since many proposed activities directly affect residents whose backyards line the study area (e.g. Willowleaf, Paonia, Silverberry and Buckthorn) many of those residents were contacted in an attempt to gain a better understanding of their concerns. The Task Force also reached out to the KC Conservation

Club to seek its position on some of the changes being proposed. The Clubs response to our outreach effort is presented in Section 7.2.1.

Most recommendations have been well received by the community, specific endorsements and concerns are discussed in the appropriate subsections of this report.

2.0 Stakeholder Comments

2.1 Firewise Board

Wildland fires have become a fact of life in Colorado. In the past five years (2014 – 2019) over 550,000 acres have been burned. During this time frame over 260 homes and 75 structures were destroyed or severely damaged. This timeframe does not cover two of the most infamous fires in Colorado's recent history. The Hayman Fire which destroyed over 137,000 acres, 133 homes, 450 structures and was responsible for the death of five firefighters occurred over six weeks in the summer of 2002. In less than three weeks during the summer of 2012, the Waldo Canyon Fire destroyed over 18,000 acres and 346 homes. Sadly, there were two civilian deaths associated with this fire.

KCR is particularly susceptible to wildland fires and is situated in an area most similar to the area where the Waldo Canyon Fire occurred almost 8 years ago. Most recently in 2017 and 2019, there were fires in the Dakota Hogback area and in Deer Creek Canyon. Other fires will inevitably occur.

Because of this, the BGP Task Force considers the Firewise Committee an important stakeholder. On 11 February 2020 a member of the Firewise Committee (Mr. Daniel Hatlestad) provided an overview of how a hypothetical fire emanating west of KCR could descend the Massey Draw area and impact the KC Valley.

The key items discussed were:

1. The Valley Parkway will not serve as a firebreak and therefore the fire could continue down Massey Draw into BGP.
2. The obvious natural firebreak in BGP is the large red rock outcropping on the easternmost edge of the Task Force's study area.
3. The area to the south of the rocks would serve as the logical area for firefighters to establish a firebreak to prevent the fire from continuing through BGP towards the community center (and beyond).
4. The 38 homes adjacent to the park boundary area are naturally most at risk.
5. The best way to eliminate the progression of a fire is to reduce/eliminate the fuel sources located in and near BGP.
6. The ponds located in BGP, and near the Dakota Lodge would not provide an adequate source of water to fight a fire. The pond located in the South Valley Park and Chatfield Reservoir would in all likelihood serve as the primary water source used by aircraft to combat a fire.

Insurance Companies establish policy premiums based upon zip codes. Approximately 75% of zip code 80127 is west of C-470 and therefore it is similar to the Waldo Canyon area. As the frequency of wildland fires increases, fire insurance premium costs and deductibles will change. In California, deductibles are approaching \$30,000 for high-risk residential properties and premium costs are rising. In some instances, Insurance Companies will no longer write policies in very high-risk areas. A reluctance to underwrite policies is already occurring in the 80127-zip code area*

***Reference** https://myhippo.com/?utm_source=comcast&utm_medium=email&utm_campaign=Xfinity-E10024-v1&utm_content=mod1_cta_get_a_quote&rid=8667191835&mid=20190925_Adhoc_CM_Hippo_September_SLA&partner=xfinity

Based upon input received from the Firewise Committee the following recommendations are made:

1. *The grassland area immediately east of the Valley Parkway should be mowed approximately 40 feet beyond the current irrigated grass area. It should be mowed to a height of approximately 4 inches at least three times during the summer season.*
2. *Where feasible other fuel sources, primarily dead trees and shrubs should be reduced/eliminated throughout the park.*
3. *The 38 homes adjacent to BGP should be notified of the fire hazards and be asked to eliminate as many nearby fuel sources as possible. Where feasible they should be allowed to mow up to 20 feet into the park from their property boundary. This extends the current mowing area by 10 feet. The current prohibition against cutting bushes with branches over 1-inch diameter should remain unchanged. However certain exemptions may be granted on a case by case basis.*
4. *The MA should request an opinion from its current insurance agent regarding the potential for premium and deductible increases. Reserves should be increased accordingly.*
5. *West Metro Fire should be contacted to see what if any modifications can/should be made to allow better access to BGP, particularly the area south of the red rock outcropping.*

2.2 Equestrian Center

KCR Equestrians are another important stakeholder group whose input was solicited in developing this report. During their presentation at the 11 February 2020 Task Force meeting they cited the need to keep an open (unpaved) trail through BGP. From their perspective, all trails should be wide enough to support multiple uses and few if any blind curves should exist. The latter concern is related to reducing the chance of spooking the horse because a hiker, runner, or biker appears unexpectedly.

Another concern is the proximity of the trail to the northern boundary of the current playground area. If the playground footprint is expanded, the preferred expansion area would be to the east and south since any northern reconfiguration would reduce the distance between the trail and the playground.

During the discussions, it was noted that the overall equestrian usage of BGP has decreased significantly over the past 25 years. It was explained that this drop off in usage was because the independent riding company that leased space from the Equestrian Center ceased operations several years ago. When asked if this type of operation could be reestablished, the equestrian representative felt that it was highly unlikely.

Based upon input received from the Equestrian Representative the following three recommendations are made:

1. *The boardwalk portion of the path that begins at the northern corner of the red rocks and travels through BGP to the Valley Parkway be expanded to facilitate equestrian usage and no further additions to accommodate mountain bikes should be added.*
2. *All future modifications intended to address erosion concerns should be made with equestrian usage in mind.*
3. *If the playground area is expanded it should be limited to the east and south.*

2.3 Bradford Schools

At the 11 February Task Force meeting the possibility of adding the two schools located in the Valley (i.e. Bradford South and North) as Stakeholders was considered. These school have approximately 800

students, and are located within a mile from BGP. Essentially all of the students are KC residents and most live within the Valley. The curriculum at Bradford is evolving and is focusing on a Problem Based Learning (PBL) format. PBL is essentially a hands-on approach to learning. Since the 3 thru 8-grade science curriculum includes the study of the environment and ecosystems, native Americans, as well as geology it is obvious that BGP offers a very unique learning opportunity. In fact, the National Wildlife Federation has established a Schoolyard Habitats® program that provides information to schools interested in creating this kind of learning environment.

The Task Force Chairman approached the school Principal, Mr Gene Lewis to see if there was interest with using the park on a more formal basis. It was agreed that there are a number of opportunities to support the BPL initiative. As a point of reference, Bradford has worked with KC staff when using open space resources to instruct students in the past. For more than 15 years touring the pond was a standard part of the third-grade curriculum. Today students take water samples of the pond and work with the KCR Open Space Manager in coordinating outdoor learning activities.

At the 22 February 2020 Task Force meeting Bradford was formally included as a BGP stakeholder. One of the key discussion areas related to the cost associated with any educational improvements. The Task Force recognizes that as a private entity KCRMA cannot accept public monies from the PTA. However private donations from the school's sponsors could be a funding stream. Mr. Lewis, believed that this would be a possibility and as projects are identified he would seek funding.

The Bradford teachers identified the following potential BPL areas:

- Placing signs similar to those at the Bradford Perley House in a few selected areas within the park noting historical and geologic areas of importance
- Place birdhouses designed and built by the students throughout the park. Ideally this would be done with assistance from KCR residents who are active in the Audubon Society.
- Design and build "bug hotels" and place them in selected areas in the park (e.g. near the pond)
- Establish areas along Massey Draw Creek and the pond that the students could use to more easily/safely take water sample and flow measurements.
- Place wildlife cameras in selected areas in the park and throughout the Valley. Areas would be identified with input from Open Space, Conservation Club and other interested groups.

Based upon input received from Bradford North & South the following recommendations are made:

Support the Bradford initiatives described above and help the school achieve National Wildlife Federation Schoolyard Habitats® certification.

3.0 Playground and Surrounding Area (Questions on this section can be directed to Marketa Murray at mata0013@yahoo.com)



Existing playground looking west

3.1 Existing Condition

The playground is approximately 30 years old and is in need of repair and is geared for toddlers and very young children. It is currently scheduled for an upgrade in 2024, and KCRMA reserved funding has been accumulating for a number of years. Approximately \$81,000 has been budgeted for this activity.

The playground consists of a climbing structure, a pony ride which is extremely popular with the residents, and four swings. The swing seats have been replaced over the years and are considered to be in good condition. The climbing structure is in need of repair and since there is limited shade, many of the features are extremely hot to the touch. This is particularly true of the ponies in the summertime. Engineered bark serves as a soft foundation to reduce the impact from falls.

There is a bench and a bear proof trash receptacle nearby. There are also two picnic tables to the south of the area but are considered to be too far from most of the equipment. They are of the older concrete variety and will at some point in time be replaced with those made of logs, similar to those located near the Bradford Perley House. The grass area between the two picnic tables is typically overgrown which makes it particularly difficult for young children to walk through.

Despite all of these shortcomings, the playground area is frequently used as can be seen by the picture below.



The first day of summer 2020 after playgrounds are open (post Covid – 19 restrictions)

3.2 Concepts/Options Considered

Four specific options were initially evaluated.

Options	Pros	Cons
Number 1 – No Action	<ul style="list-style-type: none"> • No cost. • Least disruptive to open space resources and neighboring community. 	<ul style="list-style-type: none"> • Equipment needs repair and it is becoming a safety issue. • Current equipment is not as engaging for older children. • No shaded areas available. • Existing picnic tables are too far for effective use. • Minimal value to community.
Number 2 – Repair existing equipment. Provide shade and add a new piece of equipment within the existing playground boundary. Estimated Cost: \$39,692.00	<ul style="list-style-type: none"> • Least expensive option • Leverages use of existing equipment • Considered more of a maintenance project with no impact to open space resources and neighboring community. 	<ul style="list-style-type: none"> • Equipment not as engaging for older children • Picnic tables too far from playground for effective use. • Does not significantly increase value to community

	<ul style="list-style-type: none"> Keeps equipment familiar to residents. 	
<p>Number 3 – The “Eastern Expansion Phase” provides equipment geared towards older kids with a focus on fitness. The area would extend approximately 35 feet to the east from the existing playground area.</p> <p><i>Estimated Costs: \$37,093.00</i></p>	<ul style="list-style-type: none"> Engages usage by older children. Utilizes newer and safer equipment. Provides additional seating and shaded areas. Adds value to the community. 	<ul style="list-style-type: none"> Higher cost. The expansion could cause concerns for some within the community since it has an impact on open space as a result of expansion.
<p>Number 4 – The “Southern Expansion Phase” is located between the two existing picnic tables and includes natural material, some manufactured equipment, and a footpath to the pond.</p> <p><i>Estimated Cost: \$18,360</i></p>	<ul style="list-style-type: none"> More exciting designs and playground equipment for all ages. Improves aesthetics of playground. Natural materials and biodiverse environments provide opportunities for sensory engagement and unstructured play. Natural materials can be salvaged from maintenance and construction projects (i.e., logs from tree removals, boulders and dirt from excavations) to lower costs. Adds pride of ownership if Boy Scouts of America and Bradford students are involved with construction. Significantly improves value to the community. 	<ul style="list-style-type: none"> Higher Cost The expansion could cause concerns for some within the community since it has an impact on open space as a result of the expansion. This is particularly true of the proposed addition of a footpath to the pond.

3.3 Recommendations

The Task Force evaluated each of the four (4) options and after much discussion and research believes that Options 2, 3, and 4 should be implemented over a period of time. There is ample space to accommodate the new playground(s). It will provide opportunities for a wide age group of children, and will increase the overall value of the park. Provided below are the concepts being recommended for each of the three areas. A Google Earth view of the footprint of the proposed area is provided at the end of the subsection

- ***Repair and Upgrade the Original Playground Area***

The existing equipment should be repaired and the jungle gym set retrofitted with a shade structure. Since a shade structure over the ponies may not be feasible due to its high cost, consideration should be given to replacing the two darker colored ones with two lighter colored ones (e.g. white and yellow). The shade structure for the gym set should be as natural as possible, and no bright colors should be used. Since there is a large amount of space between the current equipment it is recommended a “Vippy” be added (see picture below). The existing engineered bark should be refreshed.



Typical Shade Structure over gym area



Vippy

- ***“Eastern Expansion”***

It is recommended that the playground area be expanded to the east by approximately 35 feet with little expansion to the north due to equestrian concerns. The equipment should be geared towards older children and have a focus on fitness and agility. The key structure being proposed is called a “Fitness Challenge” by its manufacturer. To seamlessly tie the original playground area with the expanded area it is proposed that a new tire swing set be placed next to the existing swing set. Finally, as space permits a rock wall, should be included. It is recommended that the area be covered with engineered bark similar to the bark used in the original playground area. Additionally, one of the picnic tables located at the far end of the park (near the old playground area) should be relocated and provided with a shade structure.



It is suggested that the picnic table be located on the southeastern corner of the new area. Also, trees should be planted near the area to provide future shade.

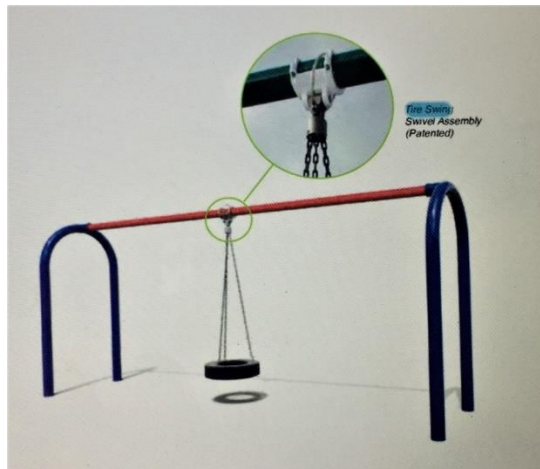
*Looking west
approximately 40 feet
from the current
playground boundary.*

A final recommendation for this area is the addition of a porta potty similar to the one located at the Bradford House in the North Ranch. It is suggested that this facility be placed just to the north of the new playground area behind the trees. A majority of the Task Force members preferred this location since it is the easiest for younger children to use; it is the farthest away from any houses; maintenance access can be accomplished via Willowleaf trail; and many believe that having it in the parking lot area could contribute to vandalism.

Provided below are pictures of the equipment and facilities being proposed. A general equipment layout is provided in Appendix 7.2.1



Miracle Inc. Fitness Challenge System



Tire Swing



Rock Climbing Wall



Bradford Porta Potty



Typical Shade Structure for Picnic Table Currently in Use in Ken Caryl

- ***“Southern Expansion”***

This option is considered to be DIY area.

It is proposed that it be a Boy Scout and neighborhood build project. It is envisioned to be an area of approximately 5,600 sq. ft. located between the existing picnic tables covered with pea gravel to provide a soft foundation to reduce the impact from falls. The playground boundary would be made of tree trunks and logs. It is proposed to contain a large sandbox area in its center which would be framed with natural logs. Buried beneath the sand would be two “archeological finds” permanently mounted into the ground beneath the sand. It is suggested that a box of toys (shovels, pails etc.) be placed in the sandbox area. Two X-Cavators which will be secured to the ground would be available to “move” the pea gravel for “construction projects.”

To further the natural setting, boulders would be placed in strategic locations and used for climbing. Logs of varying sizes will be secured and placed in a line as steppers. Since the eastern expansion does



not include a balance beam it is proposed that one be constructed using all-natural materials. It is also proposed that one or two game tables (Tic Tac Toe and Checkers) be available and a “Little Free Library” be located in the area.

*Looking south from the
“eastern expansion area”*

Since there will be a trail used by walkers/hikers/cyclists between the playground areas, “Slow Children at Play” signs should be provided.

The pictures provided below are intended to provide inspiration on what could be included in this natural playground area.

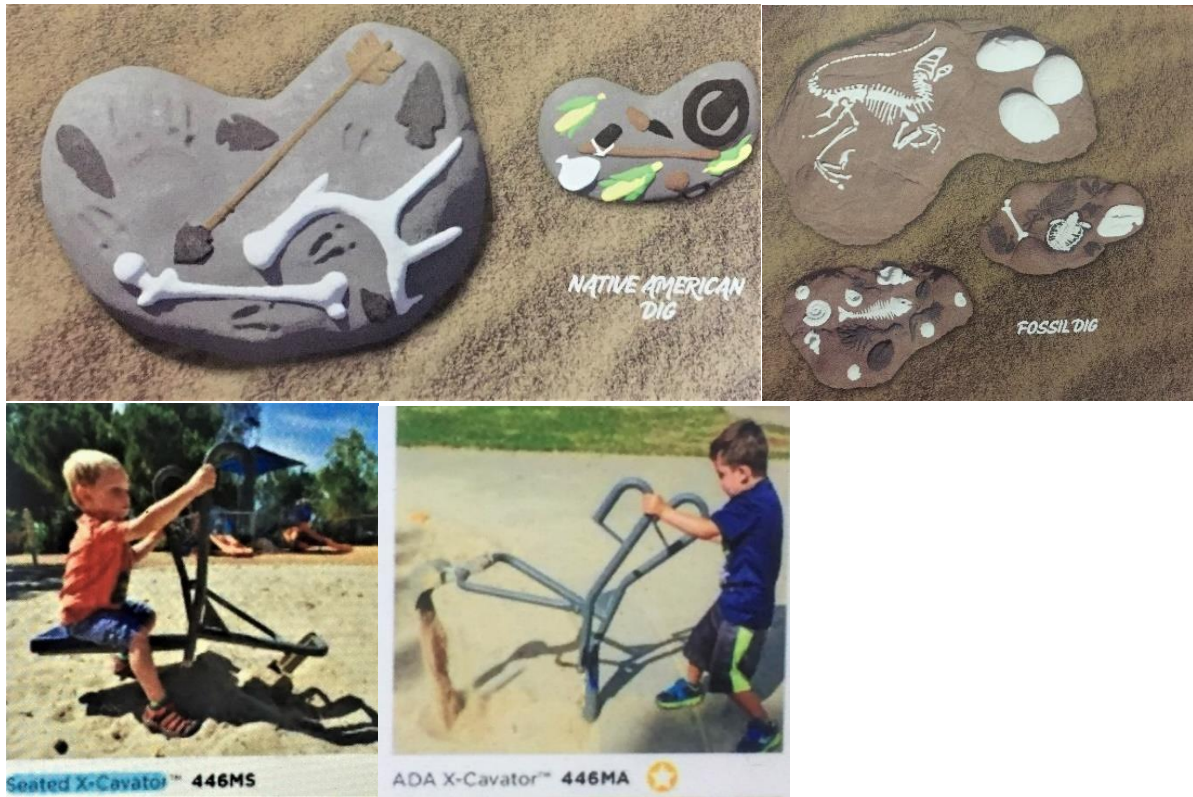








Pre-manufactured pieces proposed in the DIY park area.



"Archeological finds" buried and secured in sandbox area
Two types of X-Cavators

- ***Footpath to the pond***

A final element of the proposed "Southern Expansion" is a footpath to the pond. While not viewed as a formal trail it is envisioned to be a footpath the children would navigate to get to the pond. There would be as little disturbance as possible and the children would have to climb over fallen trees and duck under tree limbs and other obstacles which would hopefully broaden the experience. It will also eliminate bicycles from using the footpath.



The ground area would be modified slightly for safety reasons since there is an area that is sometimes wet. A stepping stone section could be added to alleviate this issue.

General location of proposed footpath

Example of a Bug Hotel

A final addition to the area includes bug hotels and birdhouses. These would be built, placed and studied by Bradford students further instilling a pride of ownership.



Example of footpath steppers

The proposed footprint of the playground area is shown below. The white shaded area shows the expanded footprint of the existing playground area – known as the “Eastern Expansion.” The yellow shaded area depicts the footprint of the proposed nature area playground area - known as the “Southern Expansion.”



Overhead view of the footprint of the proposed expansion

3.4 Proposed Schedule

Ideally, the needed repairs and equipment additions to the existing area could be accomplished in 2021. Since the proposed Southern Expansion area is a DIY type of project, planning could be in 2021, with a build out in 2022. It is recommended that the Eastern Expansion bid/procurement process begin in 2023 with installation in 2024 which is the timeframe the original area was to be replaced.

3.5 Cost Estimate

Provided are the cost estimates for the proposed modifications to the playground. Additional cost information and a general layout of the proposed playground area is contained in section 7.2.1

Repair and Augment Existing Playground Area	
Estimated Costs	Scope of Work
\$39,692.00	<i>Repair/Renovate existing gym/climbing equipment, add shade to gym area, replace ponies with newer models, add a "Vippy", refresh engineered bark. Freight, demolition, disposal, and all labor included.</i>

Eastern Expansion	
Estimated Costs	Scope of Work
\$37,093.00	<i>Provides: Tire Swing; Fitness Cluster which includes Flip-Flop Climber, Boulder Ridge Rock Wall, Tarantula Climber, 4 ft Cargo Climber, Peak 2 Way Climber, Bongo Perch Links; site preparation, ground fabric, engineered wood fiber, wood boarder to match existing play area. Freight and labor included.</i>
\$16,288.00	<i>OPTIONAL Provide Shade Structure for relocated picnic table. This price was obtained from the playground vendor. Before giving this option further consideration it is recommended that the Boy Scouts be contacted to determine if they could construct something similar to the typical shade structure currently in use within Ken Caryl (See photo above)</i>

Southern Expansion	
Estimated Costs*	Scope of Work
\$1,000.00	<i>Design Consultant (Optional)</i>
\$4,360.00	<i>Manufactured Equipment: X-Cavator (seated); X-Cavator (standing); Fossil Diggable (Dino Nest and Native American) Freight included.</i>
\$11,500.00	<i>Site Preparation, play sand (10ft x 10ft x 1ft), pea gravel (approx. cubic yards); ground fabric, stepping stones for footpath</i>
\$1,500.00	<i>Miscellaneous Materials for DIY Build (i.e. fasteners, concrete, rebar etc.)</i>
\$18,360.00	Total Estimated Costs (Does not consider possible reduction in costs from donations raised by Eagle Scouts)

**Much of the construction material can be obtained from tree removal operations by KCRMA, KCRMD, and residents who are cutting down trees etc. Boulders may be scavenged from other areas within KCR. An area within KCR will need to be identified to stockpile the material for approximately a year. It is recommended that Eagle Scouts be involved with a major portion of the build out process. Also, it is suggested that some of the equipment and tools be provided by KCRMA and KCRMD.*

4.0 Pond and Immediate Surroundings (Questions on this section can be directed to Del Grau at dlsash@q.com)



*Looking
north taken
in
September
2019*

Existing Conditions

The BGP pond was constructed in the mid-1950s to serve ranching operations and has been a notable feature of the neighborhood for decades. It has a surface area of approximately 8,000 square feet and an estimated average depth of 2.5 feet. It has five water sources; two surface water and three groundwater. A new surface water source located on the western side of the pond was created as part of the drainage and sidewalk restoration project completed in the Spring of 2020. The original source of water is Massey Draw Creek which provides water via an inlet on the northern bank. This creek once flowed well into the summer months but has been mostly dry over the past 20 years. During moderate to heavy rain events, water does flow from the Massey Draw Creek into the pond but the inlet channel is in need of repair. In heavier storm events the water jumps the inlet and bypasses the pond entirely. The three groundwater sources are on the southwestern side of the pond.

There is a single discharge located on the eastern bank. The amount of water in the pond has been relatively constant throughout the years. The water level does not significantly decrease over the summer months since the groundwater sources maintain a relatively constant water level throughout the year. It is anticipated that the recently installed drainage pipe will increase the amount of water

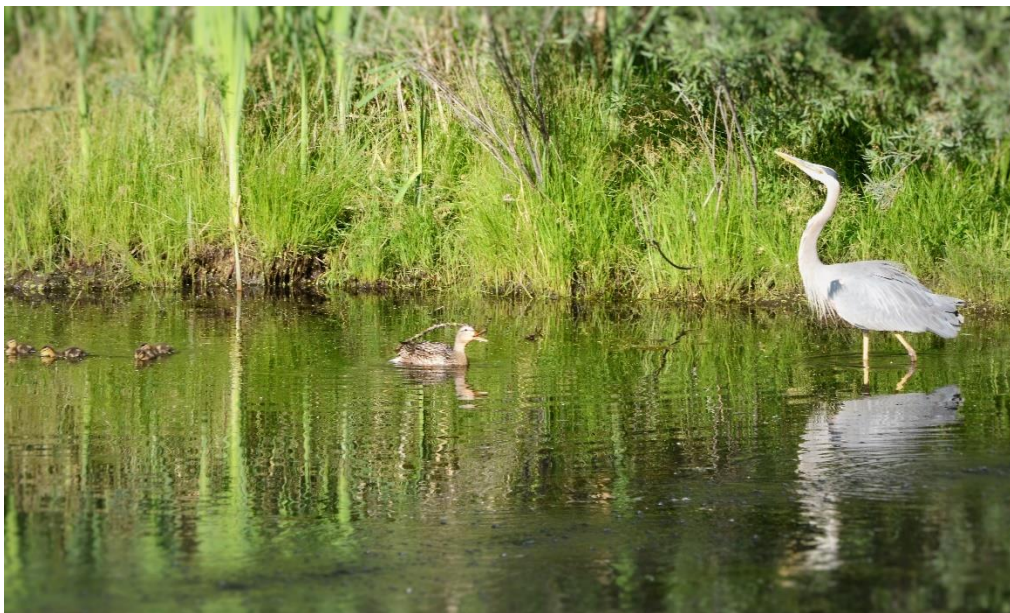
flowing into the pond. Section 5.1 provides a more detailed description of the surface and groundwater sources within BGP.

In June 2004 there was a major flooding event that deposited a great deal of sediment into the pond*. No noticeable algae or cattails appeared until about 2011. Six years ago, an aeration system was installed at a cost of approximately \$17,000. In April 2014 two treatment products recommended by Keeton Industries, (Aqua-Tron Pond Clarifier and a Waste and Sludge Reducer product) began to be used. They have been applied every few weeks during the summer months over the past six years at a cost of approximately \$2,000.00/year. Unfortunately, the treatments and the aerator have done little to improve the pond. In June 2018, the aerator failed and was repaired at a cost of approximately \$1,200. The contractor who repaired the system (Solitude Lake Management) recommended having the pond dredged.

(***Reference:** <https://www.youtube.com/watch?v=i3rU6tqdVdU>)

The original inlet and discharge piping are in disrepair and the grate covering the discharge pipe is often clogged. There are clumps of cattails growing along the banks and they have grown in size over the past few years. Tall native grasses surround the pond on three sides. The northwestern bank is lined with native trees and shrubs. Despite its limitations, the pond continues to be a resource used by many. On summer days there are children fishing. In the spring, many residents admire the ducks that have returned to raise ducklings.

There are fish, muskrats and frogs that live in the pond. As can be seen by the picture below, taken in July 2016, a duck is protecting her young from a possible attack by a blue heron which also on occasion calls the pond home.



4.1 Concepts/Options Considered

The table below highlights the options studied by the Task Force including their estimated costs. Detailed costs are provided in Section 4.4.2 for the option being recommended.

Options	Pros	Cons
1 – No Action.	<ul style="list-style-type: none"> No additional costs. ** Least disruptive to Open Space resources and neighboring properties. <p>**Currently the KCRMA spends approximately \$2,200.00 per year for microbial treatment and electrical power for the aeration system. Over the past 6 years approximately \$31,000 has been spent.</p>	<ul style="list-style-type: none"> The pond will eventually become a marshland which will increase the mosquito population and add costs associated with control/mitigation. Loss of aquatic habitat and overall biodiversity. Deferring maintenance on inlet & outlet structures will become a safety concern. Loss of value to community.
2 – Hire Pond & Lake Consultant to Study Pond and Make Recommendations <i>Estimated Cost: \$10,000</i>	<ul style="list-style-type: none"> Obtain professional opinion on current pond maintenance and remediation measures, and other possibilities. Obtain ‘best practices’ re: fish and wildlife protection measures. Obtain professional opinion on necessity of dredging pond and, if necessary, obtain guidance on preferred/proper dredging means and methods. 	<ul style="list-style-type: none"> No immediate action. Any action will need to wait until after expert provides opinion, 4-6 months. May only defer cost of dredging, if found to be necessary.
3 – Dredge pond and repair inlet and outlet. <i>Estimated Costs: \$27,910</i>	<ul style="list-style-type: none"> Re-establishes aquatic habitat. Returns site to original condition. Eliminates on-going treatment costs. Eliminates safety concerns (inlet/outlet). Enhances Bradford educational opportunities. A maintenance project, limited community objections anticipated. Increases value of community. 	<ul style="list-style-type: none"> Competes for funding with other projects.
4 – Dredge pond, repair inlet and outlet. Add one additional zone to	<ul style="list-style-type: none"> Re-establish aquatic habitat. Eliminates on-going cost of treatments 	<ul style="list-style-type: none"> Higher Cost. Competes for funding with other projects.

<p>existing aeration system. Install spillway, settling pool and fishing pier.</p> <p><i>Estimated Costs: \$150,000+</i></p> <p><i>(Based upon costs incurred for Dakota Pond Upgrades)</i></p>	<ul style="list-style-type: none"> • Eliminates safety concerns (inlet/outlet). • Creates increased opportunities to enjoy and experience the pond and running water created by spillway. • The spillway structure would include a maintenance drain that would allow rapid drainage of the pond if an emergency occurs. • Enhances Bradford educational opportunities. • Increases value community. 	<ul style="list-style-type: none"> • The addition of a settling pool could impact water rights (held by others) due to increased evaporative losses. • Pond expansions requires US Corps of Engineers Permits. • Will require a way to move more water through the pond.
<p>5 – Drain Pond</p> <p><i>Estimated Costs: \$45,000 to \$75,000</i></p> <p><i>(See Section 7.2.2)</i></p>	<ul style="list-style-type: none"> • Eliminates maintenance costs. 	<ul style="list-style-type: none"> • Eliminates one of two open water sources in the KC Valley for wildlife and recreational use. • Requires extension of the recently installed drainage system into the creek. • Requires an engineering solution to (1) reroute existing groundwater sources into creek, (2) address the grade differential between the inlet and outlet structures. • Decreases value of community.

4.3 Recommendations

Option Number 3 was ultimately selected due to cost, schedule and outcome considerations. This option was recommended by Solitude Lake Management in June 2018, and again by EcoResource Solutions Inc in June, 2020 under an \$1,100 contract approved by Ms. Victoria DeSair.

It is interesting to note that from an historical perspective the impetus to maintain the pond goes back to a 1979 report* developed for the Ken Caryl Ranch Corporation. Key passages regarding open waters in the KC Valley include:

- “Images of water birds on an inland pond bring a wilderness quality, even if the pond is surrounded by houses” (pg. 10)
- "Water birds can add variety and excitement to a residential area. But they need an adequate supply of clean water and a variety of cover and nesting spots" (pg. 11)
- “Bird diversity tends to occur rapidly following habitat improvement (or degradation) near ponds or stream riparian habitat” (pg. 33)

Finally, a quick review of Google Earth shows that there are only two open water areas on the west side of the Dakota hogback within 10 miles of the Valley: the ponds within the Red Rocks Country Club and

the Mann Reservoir in South Valley Park. This further demonstrates the need to continue maintaining the pond near Dakota Lodge and repair and maintain the pond in BGP.

*Reference: "Wildlife of the Ken-Caryl Ranch stoecker-seammerer & associates, July 1979

4.4 Proposed Scope of Work and Cost Estimate

4.4.1 Scope of Work

The initial activity would be to contract with an engineering firm to develop the necessary bid documents for the project. Two potential firms are Mueller Engineering and Aqua Serra. Both have provided engineering services to the KCRMA in the past.

The selected firm would confirm that the results of the environmental sampling (conducted by EcoResource Solutions Inc.) allow on-site sediment placement, establish project parameters such as dredging volumes and slopes, defining the final sediment placement area, sediment runoff/erosion prevention methods, techniques to be used to repair the inlet channel from Massey Draw Creek and how the inlet and outlet structures should be repaired. Additionally, the engineering firm would establish best practices to: (1) ensure dredging operations do not impact the three groundwater sources and (2) protect aquatic life. With input from the engineering firm and the Open Space Manager a bid list would be developed.

The Task Force has evaluated each of these Scope of Work activities. Highlights are as follows:

Mobilization

The project will require a backhoe, haul trucks, a grader and a water truck. The best access to the project site is from the wide truck path entering BGP from Willowleaf Drive. This path has a number of corrugated pipes under it to facilitate surface water flow through the park. Unfortunately, some of the corrugated pipes will not support the weight of the construction vehicles. As a result, gravel will be placed and spread over three areas to build up the roadway. At the conclusion of the project the gravel would be spread more evenly along the entire length of the pathway.

Dredging

The average depth of the pond is approximately 2.5 feet. In the winter of 1996, it was measured to be approximately 6 feet in depth at its center. To restore it to a similar depth will require dredging. Based upon a surface area of approximately 8,000 sq. feet and allowing for a gentle slope from the edge of the pond for safety considerations it is estimated that the amount of volume to be removed is on the order of 1,150 cubic yards. This is one of the key parameters to be established by the Engineering firm since it will form the basis of all bids and resultant costs. Other key aspects of the dredging operation will be to ensure it does not impact the existing groundwater sources and take the appropriate mitigation measures to limit damage to the fish population. Re-stocking the pond would be a consideration.

Erosion Control

The potential for erosion will occur in two locations. The first will occur when the sediment is initially scooped from the pond by the backhoe and placed into the trucks used to transport the material to the placement area. A large plastic cover material will be placed between the backhoe and haul trucks to capture excess water and redirect it back into the pond where feasible. The second potential erosion area will occur as a result of sediment placement operations. Waddles will be placed to reduce the



amount of dirt entering into Massey Draw Creek. A grading permit will define the slope of the placement area so that runoff will eventually be directed in Massey Draw Creek.

Inlet Channel Repair

The Massey Draw Creek inlet channel consists of a 90-degree turn from the creek into an inlet structure. It is degraded and needs repair. In high water events (i.e. excessive snowmelt, heavy

rainfall), water breaches the inlet and continues across a path and flows back into Massey Draw Creek bypassing the pond.

An inexpensive fix is to place a 90-degree pre – cast concrete elbow or a PVC elbow into the creek and place it within the existing inlet concrete pipe. If as discussed in Section 5.3 the Willowleaf Drive storm water discharge is modified and a piping system put in place to redirect the stormwater into the pond a concrete or PVC “Tee” could be used.

Inlet Repair

The inlet repair consists of (1) repairing the concrete connector pipe and (2) restoring the backing of the decorative rock face that has eroded away.

Assuming this activity is done during dredging operation the repair should simply consist of developing wooden forms and pouring concrete into the voids. Since the area around the inlet would be relatively dry this is an inexpensive solution. If it is done when the water level returns to its normal height additional forms and effort will be required.



Outlet Repair



The outlet repair consists of (1) repairing the rebar grate which is loose and (2) restoring the backing of the decorative rock face that has eroded away.

Similar to the Inlet repair this work should be done during dredging operation. The added cost would be to connect the grate with rebar and embed the rebar into concrete poured for filling the voids.

Hydrology Concerns

Depending upon the season the pond is dredged, to restore the pond to its proper water level naturally could take weeks, possibly months. To avoid this situation, it is proposed that water trucks (those typically used for dust mitigation on construction sites) be used to refill the pond if/as needed. Section 5.3 provides information on the BGP hydrology and discusses ways that additional ground and surface water can be directed to the pond in the future.

Sediment Disposal

The recommended method is to place the sediment on-site. (*Note: One Task Force member is opposed to onsite placement. His opinion is provided at the end of this subsection*). The other five Task Force members endorse this approach because of the following:

1.The sediment has been sampled by EcoResource Solutions Inc. and it has been found to be generally clean. The naturally occurring heavy metals are below EPA limits, while nitrogen and phosphorus, as expected, were high. The results of the tests are contained in Section 7.2.2.

2.On-site sediment disposal is considered a standard practice. Two sites where this technique was used were evaluated. On the Evergreen project, there were no neighborhood complaints and there were no signs of any disturbance in the revegetated area. The other site is on a private ranch and the reseeding effort was considered successful.



3. Three proposed sediment placement areas were evaluated. The preferred option (*identified in blue in the figure*) is away from all wetlands and outside the 100-year flood plain. Any runoff that does occur from the sediment placement will flow into Massy Draw Creek. One

potential threat to the area is excessive stormwater drainage. This would come from stormwater runoff from Silverberry and Paonia. Based upon local knowledge and a 2009 study by Mueller Engineering, the probability of stormwater impacting the area is viewed to be negligible.

4. The sediment will be spread to a depth of approximately 5 inches surrounded by waddles and graded per the requirements of the Grading permit. It is assumed the permit will require the contractor to follow the existing land contour since it would channel any water into Massy Draw Creek.

5. The area to be impacted is approximately 150ft. x 150ft. exclusive of the area impacted by hauling and spreading operations. Over the past three years, there have been three major activities within the Park that disturbed large areas that were hydroseeded: (1) The relocation of the path at the eastern end of the Park due to winter freezing issues, (2) the flood control project east of the polo ground area, and (3) the recent work on the pathway leading from the BGP parking lot to the pond. The disturbed area associated with these projects is easily four times as large as the area being proposed. All have recovered and grasses flourish.

6. The area would be reseeded with the same grass mix used on the three previously mentioned projects.

7. The asphalt walkway that is between the pond and the placement area will be damaged. This walkway is scheduled to be replaced within a year of this project being completed.

8. The Task force contacted the residents of Silverberry and those on Buckthorn that can see the proposed placement area. There are no known complaints.

9. The Task force contacted the KC Conservation Club and no major concerns were expressed regarding the sediment placement option as proposed. (see Section 7.2.1)

10. The final consideration is cost. It is estimated that off-site disposal will cost between \$40,000 and \$70,000. The lower value assumes the sediment is dewatered which requires it be stockpiled on-site for approximately 30 - 45 days before hauling. The higher cost is a result of hauling extremely wet sediment. There are many more shipments involved since the quantities the trucks

are allowed to carry is reduced by approximately 50%. There are also higher landfill disposal costs for this option.

Offsite Disposal Considerations

Everyone on the Task Force agreed that if the sediment was found to contain hazardous material it could not be placed in the park and must be disposed of properly. However, one member felt that onsite placement would be unsightly and in conflict with the Job Description of the Task Force which he believed was to beautify the park.

4.4.2 Cost Estimate

Whenever possible actual costs associated with similar work completed on KCR was utilized as background information. Internet searches were conducted and contractors currently providing services to KCR were contacted to provide additional input. No formal engineering packages were developed or formal bids solicited. When a particular vendor was willing to do a site walk and provide an estimate, it was understood that the Task Force was merely trying to develop general estimates and that if the project were to go forward, a formal competitive bid process would be used to select a vendor for a particular project.

Line Item	Estimated Cost	Comments/Cost Basis
<i>Engineering Study</i>	<i>\$5,000</i>	<i>Development of Bid and Permit Documents.</i>
<i>Permitting</i>	<i>\$300</i>	<i>Grading Permit</i>
<i>Mobilization</i>	<i>\$500 - \$1000</i>	<i>Improving Willowleaf Drive access road. Includes cost 240 sq. ft of ¾ inch rock 6-inch depth (\$400), and delivery (\$100). To be spread by KCR staff personnel. If not done by staff use high estimate range for equipment rental (\$210/day) and labor.</i>
<i>Dredge & On-Site Sediment Placement</i>	<i>\$10,360</i>	<i>Based Upon 1,150 Cubic Yards of sediment removal. Estimate provided by Silver Crown 28April2020</i>
<i>Erosion Control Wattles and Plastic sheeting</i>	<i>\$1,710</i>	<i>Wattles from Granger Supply Co. 4 units at \$231 with a total length of 480 ft. A sub total of \$1060 includes sales tax and delivery. Assumes KCR mows sediment placement area and places wattles Plastic Sheetting from "Just Pond Liners Co" 4 units of 10X15 Firestone 45 mil liner at \$112ea. Total with shipping and tax (\$550). Placed by dredging contractor (Labor \$100)</i>
<i>Hydroseeding</i>	<i>\$4,200</i>	<i>Assume ¾ acre at \$1400 per ¼ acre (internet avg price various suppliers)</i>
<i>Inlet Channel Repair</i>	<i>\$1,945</i>	<i>Schedule 40 24-inch diameter PVC 90 degree elbow (\$1023 tax and shipping included) Embed in Concrete (\$120) Labor 16 hrs at \$50/hr (\$800)</i>
<i>Inlet/Outlet Repair</i>	<i>\$2,145</i>	<i>Material (wooden forms (\$100) and 42 bags of quickrete at 3.40 ea.) (\$545) Labor 32 hrs at \$50/hr (\$1600)</i>
<i>Supplying water to pond</i>	<i>\$4,725</i>	<i>Water Truck Rental \$875/day. Fill-up (\$100 ea) Labor at \$50/hr Three days with 3 fills/day = 3x\$875+9x\$100+\$50x24 = \$4725</i>

<i>Remove/Reinstall Aeration System</i>	<i>\$750</i>	<i>Estimate based upon KCR project records</i>
<i>Temporary repair of path</i>	<i>\$1,000</i>	<i>Remove debris, general grading. Path scheduled to be replaced in 2023. Consider changing schedule.</i>
<i>Estimated Total Cost</i>	<i>\$27,910</i>	<i>Does NOT INCLUDE water supply since this is dependent upon when the work is done. That is in the late summer early fall there would be a need to refresh the pond since this is the dry season with limited flow in Massey Draw Creek</i>

As a point of reference, we currently spend approximately \$2,200/year for microbe treatment and electricity to run the aerator. The initial cost of the aerator and electrical supply system was approximately \$19,000. Therefore, over the past six years we have spent approximately \$33,000 in an attempt to restore the pond.

4.5 Proposed Schedule

Ideally the project would begin in early 1st quarter 2021 so that the project could be completed in the fall.

Milestone	Activities	Duration
<i>Award Task to Engineering Firm</i>	<i>KCRMA approves project, solicit bids, award engineering contract</i>	<i>45 days</i>
<i>Bid Documents Completed</i>	<i>Engineering firm completes study, develops RFP documents</i>	<i>60 days</i>
<i>Request for Proposal Issued</i>	<i>KCRMA Staff develops and releases RFP</i>	<i>60 days</i>
<i>Contract Awarded</i>	<i>KCRMA Staff reviews bids, recommends contractor and Board approves</i>	<i>60 days</i>
<i>Project Execution</i>	<i>Mobilize, and Complete SOW</i>	<i>45 days</i>
<i>Total Duration</i>		<i>270 days</i>

5.0 Open Space and Drainage (Questions on this section can be directed to John Fosholt at fosholt@aol.com)

5.1 Existing Conditions

The community area now known as Brannon Gearhart Park (BGP) was created in the early 1980's by Manville Corporation's development partnership, the Valley Joint Venture. The park is an open space



along Massey Draw between several planned residential neighborhoods: the Colony, Shavano and Heirloom, on the south side, and the Retreat and Stallion Pointe on the north. The park was later named *Brannon Gearhart* after a child who tragically died during construction in the Valley. Since 1992, the park and

open space has been owned by the Ken-Caryl Ranch (KCR) Master Association, a private non-profit corporation. The park is open only to KCR residents and guests.

The Valley Joint Venture's 1985 brochure says, "Most of the Open Space in The Valley will be in its natural state when it is deeded to the Master Association, and the Association will decide if additional improvements are desired and, if so, will make them." Early members of the Master Association Board say that BGP was considered a natural park, unlike the irrigated grass lawns in Heirloom Park and at the Ranch House; however, some improvements were made. The main trails were covered with asphalt, eventually to be replaced by concrete. A series of picnic tables were built along the trail, each equipped with a charcoal brazier. Four of the tables remain, but all of the braziers have been removed, and fires of any type are now banned in the park. A children's playground was built just west of the large red rock cliff in the early 1980's. That playground was later replaced by a playground in the present location near the parking lot. Nearby is a pond, which was created by ranchers in the 1950's and was maintained by the residential developers as a children's fishing pond and open water for wildlife.

Although there are no irrigated lawns in BGP, fragments of irrigation line can be found half-buried in the meadow or in the creek bed downstream from the pond. These may have been attempts to "start" trees and shrubs near the old playground and picnic tables, or they may have been part of a "demonstration garden" organized by residents in the 1990's. That garden failed, and the flowers and shrubs have faded into the native vegetation. Some non-native trees survive in the park, including three small maples in the meadow near the old playground. There are also six ash trees which were planted along the main trail. The largest of these ashes is about 30 feet tall. Horticultural authorities say that all of these ash trees will die from the invasive emerald ash-borer disease in the next 5 to 15 years. The Metropolitan District is considering treatment or replacement of ash trees along the Valley Parkway, but there are no plans for the trees within BGP, which is the responsibility of the Master Association.

A number of residents have suggested planting flowers or ornamental shrubs near the playground or parking lot. They would like to brighten the area; however, there is no watering system to sustain conventional flowers. Native dryland flowers and shrubs might be grown if a temporary watering program is developed to “start” those plants.

The dominant geologic feature of the open space is the large red sandstone rock formation which divides the main recreational area on the west side of the park from the low dry valley to the east, sometimes known as “the polo grounds.” The red rocks are easily viewed from the playground and from most of the trail, and no trees obstruct the view. The red rocks and cliff are frequented by families with children who walk along the top of the formation; however, technical climbing with hardware and ropes is forbidden by open space rules.

BGP is entirely within the drainage system of Massey Draw, which is a small intermittent stream starting in the mountains west of Ken-Caryl Ranch. The Massey Draw Creek bed at the west end of the Park is now entirely dry most of the year, but many long-term residents recall water flowing there in the 1980’s and early 1990’s. Usually the creek flowed 9 or 10 months of the year and then dried up in late summer or autumn. Prior to the residential development of Ken-Caryl Ranch, Massey Draw Creek provided water to sustain the pond now in BGP as well as an irrigated field or stock enclosure a few hundred yards to the north. Ranchers also built a ditch from Massey Draw Creek to carry water to the Tinker Shaffer Reservoir (just east of the present Deerwood Vista neighborhood) which provided water for fields and livestock. All of these water features are visible in historic aerial photos on Google Earth, suggesting a greater water flow in the creek than is observed today.

In the 1970’s and 80’s, the developers of Ken-Caryl Ranch ceded water rights for the ditch and reservoir to the water district of the West Ranch, a development in the mountains just west of Ken-Caryl Ranch. The West Ranch Water District drilled several wells in the Massey Draw drainage, including two on the property of the Ken-Caryl Ranch Master Association. There is no record that the KCRMA was ever compensated for the wells drilled on its property, although an easement was recorded with the county. The West Ranch Water District is required by a water-court decree to “return” part of its water to Massey Draw, but it does so far to the east, near where Massey Draw flows into Chatfield Reservoir.

After the West Ranch wells were completed 1992-1995, residents in the Valley began to notice a diminished flow in the creek where it entered Brannon Gearhart Park. Today, the culvert beneath the Valley Parkway leading to the park is dry 10 to 11 months of the year. Some residents suspected that the diminished flow in the creek was due to the development of storm sewers in the Barrington Ridge Subdivision on the hill west of the Park around 1990. A review of maps from the Jefferson County Road and Bridge Division, as well as an on-ground inspection, indicates that storm drains are **not** diverting run-off water away from the main Massey Draw drainage. The storm sewers simply run surface water beneath streets into the Draw.

There is also an extensive system of wastewater sanitary sewer lines in Massey Draw belonging to the Ken-Caryl Ranch Water and Sanitation District. The main sewage line for the Ken-Caryl Valley runs through the center of BGP, because it is the lowest point in the west side of the Valley. Historic aerial photos of the area show that, in the last twenty years, the creek bed has become drier, while the flat

meadowland to the north of the creek bed has become more of a marsh. Residents have noted the increased presence of cattails and other water-loving plants, while a few water-sensitive evergreen trees have shriveled and died.

A series of manholes intersect the sewer main in Brannon Gearhart Park, and for several years, residents walking the park have noticed loud sounds of rushing water in those manholes.

After speaking with these residents, a member of this Task Force requested and received maps of the sanitary sewer lines in Massey Draw. He asked the Ken-Caryl Ranch Water and Sanitation District to let him open some manholes and inspect the flow. An employee accompanied the Task Force member to the Park. In the second manhole opened, they discovered a significant flow of water discharging into the sewer from a pipe which was not shown on the map. Subsequent investigation showed the leaking pipe was an old “stub-out” installed forty years earlier for potential expansion of the sewer system. The plug for the stub-out had failed, allowing groundwater to pour into the sewer main. The District sealed the old stub-out and the infiltration leak stopped. The wastewater workers said the area around the

base of the manhole is filled with groundwater. A supervisor said that it is not unusual for groundwater to flow along the gravel “packing” which surrounds a sewer pipe and to accumulate near a manhole.



Gravel-packed Sewer Line

Several weeks later, the Task Force member followed the path of the sewer main down-gradient from the site of the leak to where the main crosses Massey Draw Creek. At that point, he found a groundwater spring discharging into the creek, at a point where he had seen no incoming water during an inspection of the creek two months earlier. It is likely that plugging the sewer leak created the spring, which has doubled the flow of the water below the pond.



A sample of the spring water was submitted to the laboratory at the Colorado Department of Public Health and Environment. A test for biologic contaminants showed zero e-Coli and a maximum of 35 parts per million for total coliform, which is well within EPA limits for

recreational use of the water.

Thus far, the spring has been flowing at an approximate volume of 5 gallons per minute, despite variations in weather and precipitation. The Task Force is looking for other possible sources of groundwater to augment the flow in Massey Draw Creek upstream of the pond.

During the Task Force investigations, an old irrigation pipe was found half-buried in the northwest end of the meadow near the trail from Willowleaf Drive.



It was probably installed around 1990 to bring water from the Valley Parkway to a garden area in the center of the park. It leads into the center of the marsh. When the protruding section of the one-inch plastic line was cut and attached to a small electric pump, water from the marsh began flowing from the marsh out of the pipe. A bacterial test from CDPHE shows the water has zero e coli and only 100 parts per million of total coliform organics, within EPA limits for recreational water. This suggests that the old

irrigation line could be re-directed, extended to the south, and used to periodically supplement the pond or creek.

In 2008, the KCR Master Association hired Muller Engineering to assess the risks associated with storm and snowmelt drainage in the Ken-Caryl Valley and BGP. Muller's 2009 report evaluated the area for four risks: flood hazard, maintenance need, erosional instability/public hazard, and water quality. Muller reported seven "problems" within the west half of Brannon Gearhart Park assigned to the Task Force. Four of those were undersized, broken or blocked culverts beneath the trails. Three of those problem culverts have since been replaced and improved. The **only remaining hazard** along the main stem of Massey Draw within BGP is **the inlet/outlet works at the pond**. Muller assessed the current structure of the pond as a maintenance hazard and a low-level water quality hazard. It recommended replacing the inlet and outlet pipes, laying additional concrete or riprap, and removing the right-angle bend at the inlet of the pond. It also suggested a secondary inlet at the southwest corner of the pond, which has been accomplished by the recent drainage and trail reconstruction work.

The only potential *flood* hazard which Muller reported in the Park is on the West Massey Draw tributary (north side of the park) by the home at 130 Willowleaf Drive. It was rated as severity 3, moderately high risk, because of an ill-defined stream channel behind the house. This same weak stream channel could present a flooding problem if pond sediment is spread in the adjacent meadow, along the Willowleaf connector trail into the park. Muller did not report any hazards, at any severity level, in the preferred location for on-site disposal of sediment from the Brannon Gearhart Park pond, that area being along the Silverberry connector trail. Similarly, no flooding or other hazards were reported at the secondary site just to the west, along the trail on the south side of the park, closer to the pond.

5.2 Options Considered

The following Open Space and Drainage Modifications / Options were considered.

No options were considered for modifying the open space rock formations, meadows, or native vegetation in BGP. Some changes in open space mowing were discussed for fire prevention.

5.2.1 Trees

Several options were considered for dealing with the expected infestation of emerald ash-borer disease on the six non-native ash trees in the Park. That infestation has been forecast to occur anywhere from 5 years to 15 years from now.

First option, the trees can be treated chemically when the disease is confirmed in the Ken-Caryl Valley. The treatments can be either injected to the tree trunks or applied to surrounding soil. The Urban Tree Alliance estimates the cost of semi-annual treatment at about \$60 per tree (a total of almost \$500 for BGP), and those treatments must be repeated indefinitely. The Ken-Caryl Ranch Metropolitan District has inventoried and mapped hundreds of ash trees in KCR parks and roadways, but it plans to chemically treat only a select number of mature and important ash trees. The ash trees in BGP are not part of the Metro District responsibility, and these trees probably are not of the size or location to warrant such treatment.

The second option for the Brannon Gearhart Park ash trees is a practice known as “shadow planting.” This involves locating each ash tree, selecting a different species of tree to replace it, and then planting a small sapling near the ash tree. When the ash dies, it is removed and the replacement tree continues to grow and take its place. The one-time cost of shadow planting would be about \$60 per narrowleaf cottonwood sapling or \$100 per honey locust sapling. Native cottonwood cuttings could be taken from within the park at no cost, but those trees would spread cottonwood “fluff” which may be objectionable to neighbors.

5.2.2 Flowers and Shrubs

Two options were considered for adding flowers or shrubs to enhance visual appeal near the playground and parking lot in Brannon Gearhart Park. Conventional annual flowers might be planted near the parking lot and watered by extending a water line from the Valley Parkway sprinkler lines, which are part of the Metropolitan District’s park system. The Parks Manager said that a similar plan was considered, at the request of the KCR Historical Society, to extend water to shrubs near the Bradford Perley House in Bradford Park. A contractor estimated the price of that extension at \$10,000, due to the complexities of tapping into a multi-zone computer-driven sprinkler system. The Parks Manager also said that the Master Association’s open space is considered outside the Metro District’s irrigation area.

A second option for flowers and shrubs would be to plant native flowering plants with low water requirements, such as penstemons, and water them by hand or truck sprayer for six months, until established. The location for such planting might be the borders of the trail near the parking lot, which were plowed and re-seeded during the trail and drainage renovation in early 2020.

5.2.3 Restoring Water to Massey Draw

Two options were considered for trying to restore water to Massey Draw Creek as it enters Brannon Gearhart Park. A minimal flow would be good for wildlife and recreation, and it should help the water quality in the pond.

The first option would be to try to return the historic surface water flow from the west end of Massey Draw, where the West Ranch Water District has been extracting water for its drinking water supply. This seems unlikely, because the Water District’s pumping volume is a matter of public record and appears to be within the limits of its water decree. The West Ranch District is entitled to use KCR Master Association property for its wells because of an easement, signed by a previous president of the KCR Master Association Board. Although the West Ranch Water District is required to return a portion of its water to Massey Draw, it does so near the mouth of Massey Draw at Chatfield Reservoir, leaving the KCR Valley with only its local snow and rainfall to replenish the creek. Thus, recovery of the old surface flow from the West Ranch area would not be feasible, either legally or mechanically.

The second water option is to find subsurface water within the Valley and divert it into Massey Draw Creek. This has already been accomplished at the lower end of BGP, where a groundwater spring developed after a sewer infiltration leak was plugged in January. The clean groundwater, which mistakenly had been flowing through the sewer line out of the KCR Valley to a sewage treatment plant, instead continues to flow along the exterior gravel packing of the sewer line. It is now discharging into Massey Draw Creek near the red rocks several hundred yards east and downstream of the fishing pond. Unfortunately, this does not help the water flow in the pond. The spring water might be pumped uphill to the pond, but such a process would be expensive, require maintenance, and produce disturbing noise.

As an alternative, it seems likely that groundwater might be following sewer lines upstream of the pond near the Valley Parkway and pooling at manholes and sewer junctions there. The Master Association might hire a drainage consultant to specifically analyze the groundwater flow around the sanitary sewer lines near the Valley Parkway and look for pockets of groundwater which might be tapped via a sort of “French drain” to empty into the nearby creek bed. This might produce a minimal flow of clean water into the pond.

5.2.4 Meadows and Mowing

No changes are considered for the meadows inside the park, but Firewise has suggested enhanced mowing along the Valley Parkway on the west side of the park. To help check the spread of potential wildfires, the 10-foot wide mowed border along the Parkway might be increased to 40 feet.

5.3 Recommendations

It is recommended that the Master Association “shadow plant” six small trees, of a different variety, near the six existing ash trees in the park. These substitute trees could be native or hardy non-native deciduous trees. Students and teachers from the Bradford School might undertake a class project to study and recommend the preferred shadow trees for each location.

Rather than attempt to plant and water conventional garden flowers in the Park, staff-supervised volunteers (perhaps school students) could plant several dozen native flowering plants along the recently disturbed border of the concrete trail near the parking lot. These plants should be of a hardy type such as penstemons or other native flowers which require low amounts of water. The plants could be watered by volunteers or staff for several months until they are established.

Regarding the drainage issue, the Master Association should contract with Muller Engineering or a similar firm to investigate groundwater flows along sanitary sewer lines near the Valley Parkway and locate pockets of groundwater which might be tapped to drain into the channel of Massey Draw Creek above the pond.

The Master Association should direct staff to increase the mowed border along the Valley Parkway on the west side of the park to 40 feet to reduce the potential spread of wildfires.



View from Valley Parkway – suggest expand mowed area by 40 ft.

5.4 Proposed Schedule

The activities involving Bradford students has been expanded so that multiple classes could be involved with the process. Ideally the engineering firm would be selected in early 2022 so that the report could be completed in time for budget consideration in September and any work conducted in 2023.

Activity	Proposed dates
<i>Bradford students identify shadow trees species</i>	<i>Complete by March 2021</i>
<i>KCRMA approves selection</i>	<i>Complete by May 2021</i>
<i>Plant trees</i>	<i>September 2021</i>
<i>Bradford students identify native plants</i>	<i>Complete by March 2022</i>
<i>KCRMA approval</i>	<i>Complete by May 2022</i>
<i>Plant plants</i>	<i>September 2022</i>
<i>Establish contract groundwater engineering firm</i>	<i>Complete by August 2022</i>

5.5 Cost Estimate

Service	Cost
<i>Shadow trees (and 1 tree close to playground)</i>	<i>Limited cost to KCRMA partially paid for by Bradford Sponsors (Estimated Cost \$750)</i>
<i>Flowering Plants</i>	<i>Limited cost to KCRMA partially paid for by Bradford Sponsors (Estimated Cost \$250)</i>
<i>Groundwater Engineering Study</i>	<i>\$10,000 - \$20,000</i>

6.0 Parking Lot, Trails & Miscellaneous Issues (Questions on this section can be directed to Seth Murphy at seth_murphy@hotmail.com)

A. Parking Lot

i. **Existing Conditions.** The Task Force had no concerns with the existing parking lot. It has been recently resurfaced and is in good condition.

ii. **New Proposals.** Members of the Task Force felt a porta-potty should be placed either in the parking lot or near the playground so that children and trail users would have an easily accessible bathroom. The Task Force did not reach a unanimous agreement on where a porta potty should be installed. While all Task Force members felt having a porta-potty within BGP was a good idea, concerns included odor, proximity to homes and potential vandalism.

B. Trails. For the purposes of this report, the trails within BGP are broken into the following classes: hard surface, soft surface, and natural surface.

I. Hard Surface Trails.

i. **Existing Conditions.** The Task Force agreed that the asphalt paved trails throughout BGP should be replaced with concrete in the near future. The Task Force understands the Master Association has a multi-year plan to replace all asphalt trails throughout Ken-Caryl Ranch concrete in the next few years. The Task Force agreed that, to the extent reasonable, the asphalt trail replacement schedule should be modified to place a priority on replacing the asphalt trails throughout BGP with concrete as soon as possible.

ii. **New Proposals.** The Task Force agreed that the short portion of soft surface trail running from the existing playground to Willowleaf Drive should be converted to concrete when the asphalt trail conversion occurs. Converting this dirt trail, which is approximately 400 feet. long, to concrete would improve this trail into an all-weather access into and from the Willow Leaf neighborhood. (See figure in email)

II. Soft Surface Trails.

i. **Existing Conditions.** The Task Force agreed that other than the concrete trail conversion referenced above, the soft surface trails throughout BGP were generally in good condition¹⁷ and required only regular maintenance. A few minor

issues, such as low/muddy spots were discussed (e.g. Silverberry trail and the truck road on the southeastern edge of the large red rock outcrop), but such issues could easily be addressed through the normal trail maintenance process.

ii. **New Proposals.** None.

III. Natural Surface Trails.

i. **Existing Conditions.** Generally, the Task Force had few concerns with the single-track trails, and felt the trails were well located and in good condition. A few minor issues, however, were noted.

The Equestrian Center representative on the Task Force noted that the turnpike installed a few years back were too narrow for many horses to cross. Often, riders need to dismount and lead horses across the turnpike because the horses spook at the narrowness. A suggestion was made to widen the turnpike to a total of approximately 8 feet in the two existing areas. The Task Force felt this was an appropriate change, and could easily be addressed through a Trail Club work project.

Next, concern was expressed about the condition of the 'equestrian trail' running behind/northerly of the playground up to Valley Parkway. Specifically, there is a short, extremely steep section of this trail that becomes heavily rutted and worn. The Task Force agreed that relocating and extending this trail slightly so that it would meander through the meadow and tress and cut diagonally across the steep slope section would make this trail more passable year-round.

Finally, there was discussion of mowing a wider swath along both sides of all trails in BGP. Currently, approximately 3' is mowed along each side of all trails 3-4 times per growing season. A suggestion was made to increase that mowed area to 6' on each side of each trail both to serve as an additional fire break in the event of a wildfire, and to lessen users' concerns regarding snakes and wildlife coming out of the tall grass. The Task Force did not reach a consensus of this idea.

The Colorado State Forest Service (CSFS) has submitted a draft report of its hazardous wildfire fuel assessment for BGP and North Massey Draw to the Open Space Manager. It recommends that a 10' wide mowed trail corridor be established as an effective fuel break. This includes the trail surface. As a result, since at least two feet on either side of the trail are being mowed, we are meeting or exceeding the recommendation.

ii. **New Proposals.** The Task Force agreed that a short footpath, running from south of the playground, down through the woods and to the westerly bank of the pond would be an added benefit to BGP. The Task Force felt this would take children through the unique woods and plant life living in the streambed area and provide access to the west side of the pond, which is currently nearly inaccessible. Discussion was also had of adding interpretive and educational signage in conjunction with the natural play elements proposed to be added to the playground. The Task Force recommends the creation of this trail and believes it could easily and cheaply be accomplished as a Trail Club or Eagle Scout project. (See Section 3.3 for a further description of the proposed footpath)

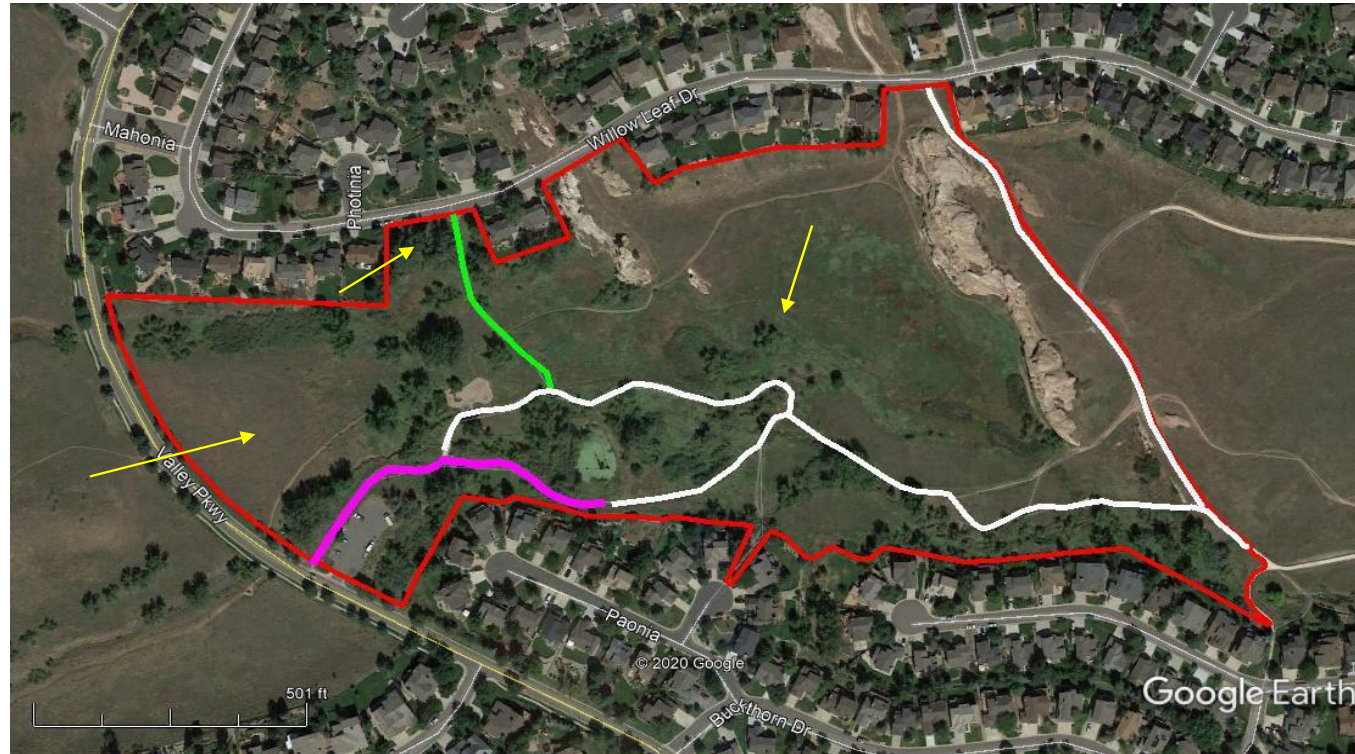
C. Miscellaneous Items. The following issues were discussed and are recommended by the Task Force:

i. **Easterly Picnic Tables.** Currently there are two picnic tables located approximately 200 yards east of the playground that are seldom used. One of these should be relocated to the grassy area directly south of the playground. However, the bear proof trash can currently located near the picnic tables should remain in place, as this sees regular use, and a dog poop bag dispenser/tube should be added nearby.

ii. **Memorial Bench and Plaque.** The memorial bench and plaque located along the walking path in BGP should be better maintained, and possibly replaced with a new bench that is compatible with Ken Caryl Ranch's current standards. There was also discussion that the bench be relocated near the pond to provide a sitting area to view the waterfowl in the pond. Any proposed changes to the bench's location should be done in consultation with the family that donated the bench.

iii. **Social Trails.** There are a number of unauthorized "social" trails throughout the study area. Many are near the large red rock outcrop and some cut through the meadow. It is recommended that the Open Space Committee, and the Trails Club evaluate these trails and make recommendations to the Open Space Staff and KCRMA Board.

A map depicting the various trails in the study area is provided below.



Purple line indicates hard surface trail paving conversion completed in 2020. White lines indicate existing hard surface trails that need paving conversion. Green line indicates recommended Willowleaf trail paving conversion. Red line indicates Task Force Study Area.

Photos of significant features discussed above:



Turnpike recommended for widening



Memorial bench



Willowleaf trail into BGP

6.1 Recommendations and Cost

<i>The Task Force recommends the following actions be taken with respect to the parking lot, trails, walkways picnic tables, and benches.</i>	
<i>Trails</i>	<i>a. The vehicle access trail from Willowleaf drive to the pond area should be paved. b The turnpike should be widened to address equestrian concerns. c. The vehicle access trail on the southern edge of the red rock outcropping is in need of repair.</i>
Estimated Cost Range: \$65,000 to 80,000	
<i>Picnic Tables</i>	<i>One of the two tables located at the site of the old playground area should be relocated and placed near the expanded playground area.</i>
Estimated Costs: Nominal presumed to be done by KCR crew	
<i>Benches</i>	<i>The memorial bench should be better maintained, and relocated near the pond.</i>
Estimated Costs: Nominal presumed to be done by KCR crew	
<i>Parking lot</i>	<i>Consider adding a porta-potty here vs. adding one in the playground area</i>
Other Perspectives to Consider: Trail Club (expanding turnpike).	Neighborhood concerns with adding a porta-potty in the parking lot

7.0 Appendices

7.1 Task Force Job Description

The following Job Description was approved by the KCRMA in October 2019.

PURPOSE

The Brannon Gearhart Park (BGP) Task Force shall review the current condition of the park and make short- and long-term recommendations to the Master Association (MA) Board regarding the future of its infrastructure and amenities. For the purposes of this Task Force, BGP is defined as the area depicted in Figure 1.

RESPONSIBILITIES

- Evaluate the condition of the following areas within BGP:
 - Existing parking lot, trails, and walkways.
 - Existing picnic tables and benches.
 - The pond and its immediate surroundings.
 - The playground and surrounding area.
 - The open space. Which is defined as all wetlands, grasslands, trees, shrubs, and rock outcroppings.
- Recommend the future use of the areas defined above.
- Develop Order of Magnitude cost estimates for all proposed repair, relocation and/or removal activities.
- Issue a Final Report containing all findings and recommendations.

ORGANIZATION

- The BGP Task Force shall be comprised of five to seven members of the community, a Board liaison, an Open Space Committee liaison, a representative of the Equestrian users, and staff representation. NOTE: A member of the Fire Wise Committee will be extended an invitation to participate.
- A chairperson and secretary shall be appointed by a majority of the members.
- Potential members shall apply and be appointed by the Board following the committee approval process.
- The Task Force has no financial authority and no authority to commit the MA Board to any expenditure.
- No action or implementation of any recommendations may be taken without approval from the MA Board of Directors.

OPERATIONS

- The members of the BGP Task Force shall determine the meeting date, time and location.
- All meetings will be held in an open session. Members of the Association will be encouraged to attend and participate.
- Meeting notes/minutes will be maintained in electronic form.
- The BGP Chairman shall brief the MA Board as appropriate (during the Board's regularly scheduled monthly meetings).
- The BGP Task Force will issue its Final Report to the MA Board before August 1, 2020.

7.2 Supporting Documentation

7.2.1 Input provided by the KC Conservation Club

Provided below is the e-mail received by John Fosholt Task Force Secretary dated 28 May 2020.

John,

Thank you for your email and yes I am part of the KC Conservation Club. I forwarded your email to a few people in the Conservation Club, as I am the least person to have knowledge of the pond dilemma in Brannon Gearhart Park. I do know that it has been in existence for the length of time that was stated in the KC article (May 13, 2020 issue). I also know that it looks disgusting walking through the park.

[Type here]

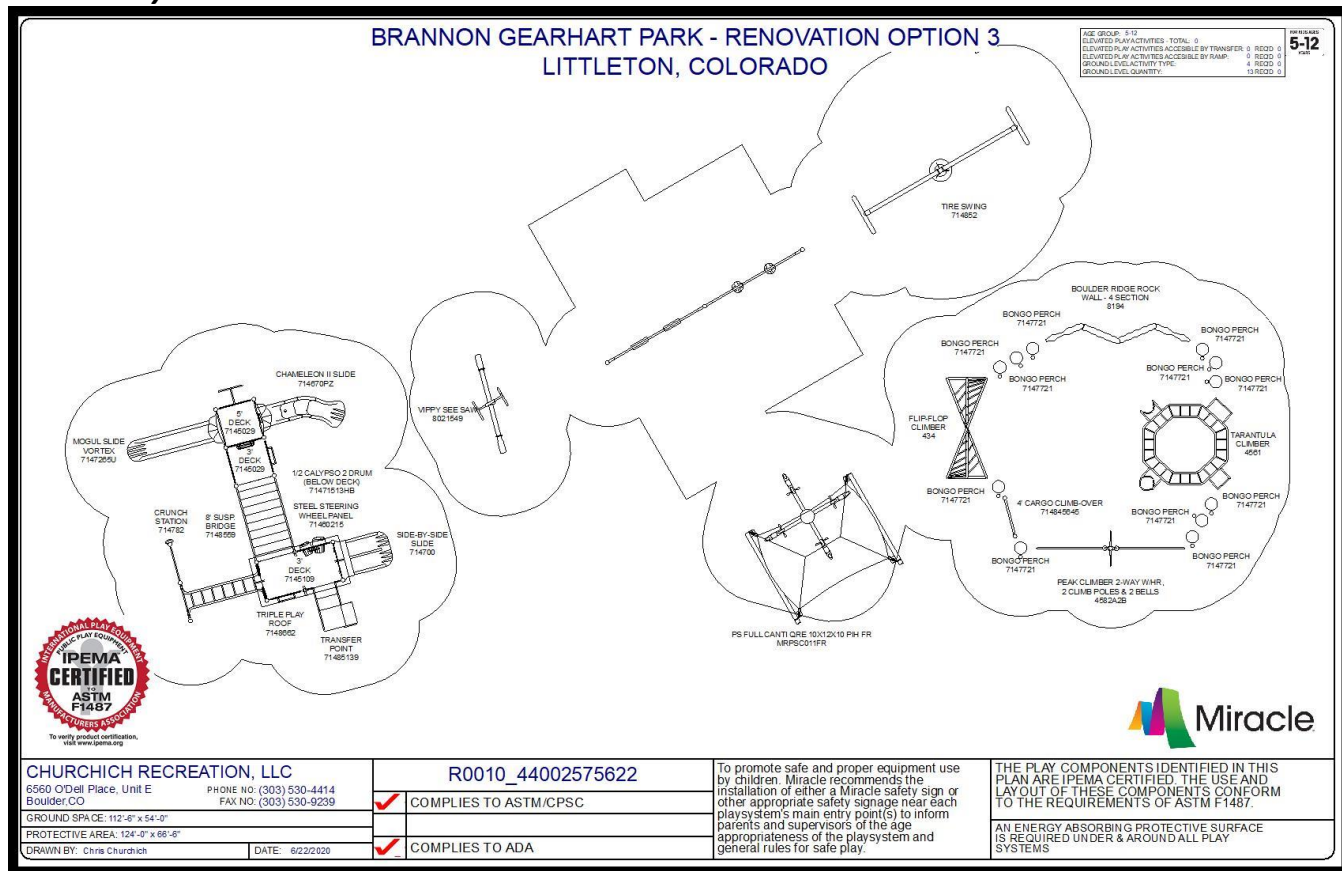
Now, "we" are under the assumption that nothing toxic has been disposed of into the pond, and that the Task Force will be getting some sort of an environmental sampling to confirm the same. An environmental cleanup engineer and a soils specialist have both said that dredging the pond and applying the dredge spoils/sediment thinly in the open space adjacent area(s) is reasonable and environmentally safe. This I've been told, will also promote better drainage (no algae buildup) and will provide nutrient rich sediments (with additional seed possibly?) to enhance the health and growth of plant life in the area. And, of course, we know that a great flora area will be beneficial to all the wildlife in the area. It would be great to give the wildlife and waterfowl a better place to drink and live; giving residents another place to watch them from a distance.

I'm not sure of the cost(s) of dredging the pond, getting it back to closer to its original depth, and am assuming that the Task Force has gotten a couple bids to present to residents. Spending monies for unnecessary projects is not being fiscally responsible at any time. The Conservation Club is concerned with the environment in our KC open space and desires to preserve it in its natural state. The wildlife has been so disrupted over the last number of years, that even little things to preserve their natural space is the best desired outcome. In the article it mentions the possibility of adding a path through a wooded area to the pond. This is an example of what the Conservation Club would NOT recommend. It is the opposite of keeping the area preserved "as is" for our wildlife. It would be preferable to keep the area as it currently is, as far as the current path is concerned.

Thank you, John, for contacting me and the Conservation Club. It is most appreciated.

Sincerely,
Rilla Reinsma

7.2.1 Playground and Surrounding Area General Layout



Artist Rendering



PLAYGROUND COST INFORMATION

PO BOX 734154
DALLAS, TX 75373-4154

Tel: (303) 530-4414 Fax: (303) 530-9239

Date	Estimate #	E.O. #
6/22/2020	20-0345	

Bill To Address:

KEN-CARYL RANCH, 7676 S. CONTINENTAL DIVIDE
RD. LITTLETON, CO. 80127

Ship To Address:

BRANNON GEARHART PARK, KEN CARYL, CO
80127

Project		Rep	Terms	FOB	
BRANNON GEARHART PARK - PLAYGROUND		CC	Net 30	Jobsite	
Item	Description	Qty	Unit Cost	Total	
	BRANNON GERHART PARK - OPTION 3 - RENOVATION IN PLACE & ADDITIONAL EQUIPMENT				
DEMO & DISP...	DEMO & DISPOSE OF EXISTING EQUIPMENT - LEAVE POST FROM EXISTING PLAYGROUND - REMOVE AND REINSTALL EWF SURFACING AS NEEDED FOR RENOVATION	1	3,500.00	3,500.00	
MREC	REPLACE ALL DECKS	1	2,889.00	2,889.00	
MREC	NEW TRANSFER POINT	1	2,492.00	2,492.00	
MREC	REPLACE SUSPENSION BRIDGE	1	4,640.00	4,640.00	
MREC	REPLACE L-SLIDE WITH SIDE-BY-SIDE SLIDE	1	1,429.00	1,429.00	
MREC	REPLACE WAVE SLIDE	1	1,672.00	1,672.00	
MREC	NEW CHAMELEON II SLIDE	1	2,770.00	2,770.00	
MREC	NEW SHADE ROOF	1	2,437.00	2,437.00	
MREC	NEW INTERACTIVE PANELS FOR ADA COMPLIANCE	1	1,972.00	1,972.00	
8021549	HAGS VIPPY	1	1,319.40	1,319.40	
MREC	NEW WHITE HORSES FOR ANIMAL HOP	4	576.90	2,307.60	
M-Freight	MIRACLE FREIGHT	1	1,667.00	1,667.00	
InstallPG	INSTALL PLAYGROUND EQUIPMENT SURFACING REFRESH	1	7,897.00	7,897.00	
GS EWF	ENGINEERED WOOD FIBER; BLOWN INSTALLATION - REFRESH SURFACING WITH 4" OF ADDITIONAL MATERIAL	60	45.00	2,700.00	
	SUBTOTAL OF EQUIPMENT LISTED ABOVE			39,692.00	
	EASTERN EXPANSION				
714852	MIRACLE: 5" OD ARCH TIRE SWING COMPLETE MIRA-COTE	1	2,957.00	2,957.00	
	Sales Tax (0.0%)				

Bill To Address:

KEN-CARYL RANCH, 7676 S. CONTINENTAL DIVIDE
RD. LITTLETON, CO. 80127

Ship To Address:

BRANNON GEARHART PARK, KEN CARYL, CO
80127

Project		Rep	Terms	FOB
BRANNON GEARHART PARK - PLAYGROUND		CC	Net 30	Jobsite
Item	Description	Qty	Unit Cost	Total
714-000-C	MIRACLE: FITNESS CLUSTER 714-S181 - FLIP-FLOP CLIMBER - BOULDER RIDGE ROCK WALL - TARANTULA CLIMBER - 4' CARGO CLIMBER - PEAK 2 WAY CLIMBER - BONGO PERCH LINKS (11EA.)	1	14,889.00	14,889.00
M-Freight	MIRACLE FREIGHT - IF ORDERED WITH OTHER EQUIPMENT ABOVE	1	459.00	459.00
InstallPG	INSTALL PLAYGROUND EQUIPMENT	1	5,990.00	5,990.00
Excavate	EXCAVATION OF AREA - PREP NEW SITE	1	4,202.00	4,202.00
Curb	INSTALL WOOD BORDER TO MATCH EXISTING	1	3,850.00	3,850.00
GS EWF	ENGINEERED WOOD FIBER; BLOWN INSTALLATION	96	45.00	4,320.00
GS FABRIC	GROUND SOLUTIONS FABRIC - INSTALLATION INCLUDED	1	425.00	425.00
	SUBTOTAL OF EQUIPMENT LISTED ABOVE			37,092.00
	SOUTHERN EXPANSION - INSTALLATION BY OTHERS			
446MA	X-CAVATOR, ADA	1	1,186.00	1,186.00
446MS	X-CAVATOR, SEATED	1	1,186.00	1,186.00
16202B	FOSSIL DIGGABLE: DINO NEST	1	695.00	695.00
16200A	FOSSIL DIGGABLE: NATIVE AMERICAN HUNTING	1	785.00	785.00
FREIGHT	FREIGHT	1	509.00	509.00
	SUBTOTAL OF EQUIPMENT LISTED ABOVE			4,361.00
			Sales Tax (0.0%)	\$0.00
			Total	\$81,145.00

Terms and Conditions

This quotation and attached terms and conditions must be attached and included as an exhibit to any contract, which is entered into as a result of this quotation. Failure to do so will result in such contract being returned unsigned until these items have been included, thus delaying the processing of your order.

Equipment orders with Installation service: Continuous access will be provided to the installation crew for heavy equipment traffic without obstruction for delivery and installation of equipment, safety surfacing and any other materials or furnishing provided on this quotation throughout the installation. That the site is free of utilities and that excessive rock excavation will not be required and that the proper site grade has been completed prior to the arrival of the installation crew.

[Type here]

Additional mobilization cost will be charged for each trip if site is not ready for the installation of the equipment. Core drilling or saw cutting of existing or new concrete or asphalt is not included unless specifically stated on the quotation and the installation of all furnishing and equipment not indicated as surface mount or portable should be scheduled for installation prior to concrete or asphalt construction or blocked out for in concrete forms.

Owner/Contractor site preparation and installation notes and instructions:

- **DO NOT SPREAD SAFETY SURFACE OR GRAVEL DRAINAGE PRIOR TO INSTALLATION OF PLAYGROUND EQUIPMENT.**
- Removal and replacement of existing surfacing materials is not included unless specifically indicated on the quotation.
- Quotations for Engineered Wood Fiber do not include gravel drainage systems; gravel sumps or daylight drains unless specifically noted.
- Required installation grade includes: Site excavated to proper depth and grade should be no greater than 2% for drainage. Owner/Contractor will provide safety/security fencing. *(6' Chain link security fencing can be provided upon request at an additional cost.)*

Owner/Contractor delivery and receipt of shipment:

- The Owner/Contractor will be notified 24 hours prior to delivery whenever possible.
- It is assumed that all materials can be delivered to the jobsite, and the Owner/Contractor will provide a secure location to store the equipment prior to installation. Installation price does not include transportation of materials from a secondary secure delivery location to job site. *(Secure storage can be provided upon request at an additional cost.)*
- Delivery does not include lift-gate service.
- Our installers will provide receipt and unloading of equipment whenever possible, when installation of said equipment is part of the contract.
- Lead-times vary by manufacture and are subject to change without notice. Please provide firm shipment schedules at time of order, delivery dates requested beyond 180 days are subject price increases from suppliers for materials and freight.

Insurance: This proposal contains standard General Liability and Workers Compensation coverage. Any waivers of subrogation and primary no-contributory endorsement requirements require additional premium to the provider. Any additional such charges to our policies as a result of the awarding of a contract based upon this proposal will be passed through to you at your additional expense.

Quotation does NOT include the following: taxes, prevailing wages, permits, state or local approvals, performance/payment bond, engineering seals, testing, site preparation, or storage of equipment, security, fencing, or landscaping! Unless specifically stated on the quotation.

Order and Payment Terms: Please make all orders payable to: **Miracle Recreation Equipment Co.** All orders require tax-exempt certificate. All applicable tax will be added to final invoice. Net 30 days with approved credit, Visa or MasterCard. No early payment discounts or retainage allowed. Quotation is valid for 30 days.

Failure to comply with these terms and condition will result in additional charges or contract change orders. Please contact our office with any questions concerning the attached quotation or terms and conditions, or if any additional services are required for your Project.

Thank you for the opportunity to provide this quotation.

Signature Date

Acceptance of Quotation:

I hereby authorize Miracle Recreation Equipment Company to ship the equipment listed above, and complete the specified tasks, for which I agree to pay the total amount specified. I acknowledge that I have read and agreed to the Terms and Conditions. Payment terms are Net-30 days from invoice date with approved credit. Non-taxable customers must provide proper tax exemption certificate to Miracle Recreation at time of order or tax will be added to final invoice. Purchase orders and contracts should be made to the order of Miracle Recreation Equipment Company, C/O Churchich Recreation, LLC, PO Box 1174, Niwot, CO, 80544. All Payment should be mailed to Miracle Recreation Equipment Company, 2260 Paysphere Circle, Chicago, IL, 60674.

Customer Acceptance Signature Date

Please provide the project contact information: **(address required only if different than that shown on the quotation)**

Billing Contact information:				Shipping Contact and Location:			
Name:				Name:			
Address:				Address:			
Phone:		Fax:		Phone:		Fax:	
Email:				Email:			

Miracle T&C 12

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PO BOX 1174 - NIWOT, COLORADO 80544
303-530-4414 - WWW.CHURCHICHERECREATION.NET

QUOTATION

Rep	Date	Estimate #
CC	6/22/2020	20-0346

Bill To Address:
KEN-CARYL RANCH, 7676 S. CONTINENTAL DIVIDE RD. LITTLETON, CO. 80127

Ship To Address:
BRANNON GEARHART PARK, KEN CARYL, CO 80127

Project		Terms		FOB
BRANNON GEARHART PARK - STEEL PICNIC SHADE		Net 30		Jobsite
Item	Description	Qty	Cost	Total
SSH12	STEEL STRUCTURE FOR OVER PICNIC TABLES POLIGON HIP ROOK SUNSHELTERS STYLE SHELTER : - SIZE: 12' - FRAME FINISH: POLI-5000 [TGIC POWDER COAT FINISH W/ EPOXY PRIMER] - ALL HARDWARE PAINTED TO MATCH FRAME	1	5,605.00	5,605.00
MR	POLIGON MULTI-RIBBED METAL ROOF	1	2,270.00	2,270.00
FREIGHT	FREIGHT	1	2,300.00	2,300.00
ENG	STAMPED ENGINEERING DRAWINGS	1	650.00	650.00
Shelter	INSTALLATION OF SHELTER & ROOF ONLY	1	2,588.00	2,588.00
Footings	INSTALL SHELTER FOOTINGS - PRICE IS BASED ON A MAXIMUM FOOTING SIZE OF 24"DIA X 36" DEEP. PRICE IS SUBJECT TO CHANGE BASED ON FINAL ENGINEERING. MAX CONCRETE PSI OF 3,500.	2	1,437.50	2,875.00
	` SUBTOTAL OF EQUIPMENT LISTED ABOVE			16,288.00
		Sales Tax (0.0%)		\$0.00
		Total		\$16,288.00

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Terms and Conditions

Equipment orders with Installation service: Continuous access will be provided to the installation crew for heavy equipment traffic without obstruction for delivery and without interruption during the installation. That the all necessary site work including footings and flatwork have been completed prior to the arrival of the installation crew. Additional mobilization cost will be charged for each trip if site is not ready for the installation of the equipment.

Quoted Price includes the following:

- All welding is performed by GMAW Certified Welders, and no field welding is required for the erection of the shelter.
- **Poli-5000** standard frame finish: **Poli-5000** is a specialized multi-step system that includes eight directional shot blast steel preparation and an epoxy primer prime coat along with a **super-durable** TGIC powder top coat.
- Roof to be Polygon pre-cut Multi-Rib Metal roofing system with Kynar-500 paint system
- Polygon will furnish all hardware and anchor bolts necessary for the installation of the shelter.
- Quotation includes delivery to jobsite, on flatbed truck.
- Standard engineering ratings are IBC 2015 Standards: 40PSI Snow Load & 115MPH Wind Load. Owner/Contractor required to confirm building code & requirements pertaining to snow & wind load prior to order. Changes in building code or loading requirements including snow loads & wind loads AFTER the shelter has been quoted will result in a change of cost.
- Installation of Polygon Shelter and Roof on footing and flatwork by others

Price does not include the following and are the responsibility of the Owner/Contractor:

- Building permits and inspection cost are the responsibility of the Owner/Contractor *(Can be furnished at an additional Cost)*
- Sales tax is not included as part of this quotation. Tax exempt certificate is required at time of order or tax will be added to final invoice.
- Unloading of the shelter upon delivery to the jobsite. **Forklift is required to unload the shelter from flatbed trailer.** Owner/Contractor will be notified 24 hours prior to delivery whenever possible.
- It is assumed that all items quoted will be delivered to a single location, and that the Owner/Contractor will provide a secure location to store the equipment prior to installation. Installation price does not include transportation of materials from a secondary secure delivery location to jobsite. *(Secure storage can be provided upon request at an additional cost.)*
- Polygon Building do not include gutters or downspouts. **(Not Required)**

Insurance: This proposal contains standard General Liability and Workers Compensation coverage. Any waivers of subrogation and primary no-contributory endorsement requirements require additional premium to the provider. Any additional such charges to our policies as a result of the awarding of a contract based upon this proposal will be passed through to you at your additional expense.

Quotation does NOT include the following: taxes, prevailing wages, permits, state or local approvals, performance/payment bond, engineering seals, testing, site preparation, or storage of equipment, security, fencing, or landscaping! Unless specifically stated on the quotation.

Order and Payment Terms: Please make all orders payable to: **Churchich Recreation, LLC.** All orders require tax- exempt certificate. All applicable tax will be added to final invoice. Net 30 days with approved credit, Visa or MasterCard. No early payment discounts or retainage allowed. Quotation is valid for 30 days.

Failure to comply with these terms and condition will result in additional charges or contract change orders. Please contact our office with any questions concerning the attached quotation or terms and conditions, or if any additional services are required for your Project.

Thank you for the opportunity to provide this quotation.

Signature

Date

Acceptance of Quotation:

I hereby authorize Churchich Recreation, LLC to ship the equipment listed above, and complete the specified tasks, for which I agree to pay the total amount specified. I acknowledge that I have read and agreed to the Terms and Conditions. Payment terms are Net-30 days from invoice date with approved credit. Non- taxable customers must provide proper tax exemption certificate to Churchich Recreation, LLC at time of order or tax will be added to final invoice. Purchase orders and payments should be made payable to the order of Churchich Recreation, LLC, PO Box 1174, Niwot, CO 80544.


Customer Acceptance Signature

Date

Please provide the project contact information: (address required only if different than that shown on the quotation)

Billing Contact information:		Shipping Contact and Location:	
Name:		Name:	

[Type here]

 CHURCHICH RECREATION		Address:		QUOTATION	
Phone:	Fax:	Phone:		Fax:	
Email:		Email:			

Rep	Date	Estimate #
CC	6/22/2020	20-0347

Project		Terms		FOB	
BRANNON GEARHART PARK - FABRIC SHADE		Net 30		Jobsite	
Item	Description	Qty	Cost	Total	
MRPSC011	FABRIC SHADE FOR ANIMAL HOP	1	5,179.00	5,179.00	
FREIGHT	PLAYSHADE: FULL CANTILEVER QRE 10X12X10 PIH FREIGHT	1	515.00	515.00	
Shelter	INSTALLATION OF SHELTER & ROOF ONLY	1	2,588.00	2,588.00	
Footings	INSTALL SHELTER FOOTINGS - PRICE IS BASED ON A MAXIMUM FOOTING SIZE OF 24"DIA X 36" DEEP. PRICE IS SUBJECT TO CHANGE BASED ON FINAL ENGINEERING. MAX CONCRETE PSI OF 3,500.	2	1,437.50	2,875.00	
` SUBTOTAL OF EQUIPMENT LISTED ABOVE				11,157.00	
		Sales Tax (0.0%)		\$0.00	
		Total		\$11,157.00	

TERMS AND CONDITIONS

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Equipment orders with Installation service: Continuous access will be provided to the installation crew for heavy equipment traffic without obstruction for delivery and without interruption during the installation. That the all necessary site work including footings and flatwork have been completed prior to the arrival of the installation crew. Additional mobilization cost will be charged for each trip if site is not ready for the installation of the equipment.

Quoted Price includes the following:

- All welding is performed in accordance with ASW D1.1 Welding Code, and no field welding is required for the erection of the shelter.
- All Steel TGIC polyester powder shall meet or exceed ASTM standards for adhesion, hardness, impact, flexibility, over bake resistance, and sea spray resistance. Manufacture provided 10-year non-prorated warranty for steel structure.
- Roof to be Shadesure High-density polyethylene woven architectural fabric, Including 10-year non-prorated warranty on the shade fabric.
- Quotation includes delivery to jobsite.
- Standard engineering ratings are IBC 2015 Standards: 5PSI Snow Load & 90MPH Wind Load with fabric. Owner/Contractor required to confirm building code & requirements pertaining to snow & wind load prior to order. Changes in building code or loading requirements including snow loads & wind loads AFTER the shelter has been quoted will result in a change of cost.
- Installation of USA Shade Shelter and Roof on footing by Churchich Recreation

Price does not include the following and are the responsibility of the Owner/Contractor:

- Building permits and inspection cost are the responsibility of the Owner/Contractor *(Can be furnished at an additional Cost)*
- Sales tax is not included as part of this quotation. Tax exempt certificate is required at time of order or tax will be added to final invoice.
- It is assumed that all items quoted will be delivered to a single location, and that the Owner/Contractor will provide a secure location to store the equipment prior to installation. Installation price does not include transportation of materials from a secondary secure delivery location to job site. *(Secure storage can be provided upon request at an additional cost.)*

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Signature

Date

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7.2.2 Pond and Immediate Surroundings

Provided below are the reasons why specific options were rejected.

Option Number 1 was rejected since the pond will continue to degrade, and become completely unusable. It would also eliminate one of the two open water sources in the KC Valley. If there is no intervention, the cattails will eventually take over much of the 8,000 square feet surface area and over time it will become more of a marshland area. It is presumed that since there are still three sources of groundwater, mosquitoes would become an issue.

Option Number 2 was rejected since it was considered an unnecessary expenditure. It also had the potential of delaying any action for two years when considering the budgetary calendar of the KCRMA. Furthermore, since Solitude Lake Management – the firm that repaired the pond aeration system in June 2018 - recommended the pond be dredged, a majority of the Task Force members felt that a professional opinion to dredge the pond had already been made. Finally, since both of the two dredging options included an engineering and environmental study it was deemed the work proposed in Option Number 2 was redundant.

Option Number 4 was rejected because of costs. While having an expanded footprint and the ability to have more consistent running water over a spillway was very desirable, the engineering, permitting, and construction costs were deemed to be excessive. In addition to those costs, there would be an added cost of providing a system to provide water for the pond/spillway. Refer to Section 5.0 for more information on the groundwater and surface water issues within BGP.

Option Number 5 was rejected for several reasons: (1) similar to the first option it eliminates an open water source and creates a potential mosquito problem, and (2) once breached the exposed pond bed would be an eyesore unless it was graded and hydroseeded. In addition to costs associated with creating a channel to drain the pond, there would be costs for creating some type of collection and drainage system to collect the water coming from the three underground water sources and the recently installed surface water source. Of all of the options evaluated, breaching the embankment is considered to be the least desirable. Costs associated with this option include:

- An Engineering study to evaluate hydrology, and develop design drawings for (1) beaching dam wall, (2) new channel and spillway to Massey Draw Creek (from existing pond inlet), and (3) methods to collect water from recently installed surface water spillway, and three underground water sources, and (4) Request for Bid documentation with quantities etc.
 - Cost Range: \$15,000 to \$20,000
- Select a Construction Contractor to: (1) permitting and mobilization, (2) breach dam, (3) install multiple drainage systems, (4) provide final grading, (5) hydroseed, (6) and dispose of demolition waste materials (i.e. inlet and outlet structures)
 - Cost Range: \$30,000 to \$55,000

Report by EcoResource Solutions Inc



July 20, 2020

RE: Spring 2020 Sediment Quality Results – Ken Caryl Ranch

**5765 Olde Wadsworth Blvd., Ste. 10
Arvada, CO 80002**

Voice: (720) 974-4075

Fax: (720) 974-4830

www.EcoResourceSolutions.com office@EcoResourceSolutions.com

Dear Ken Caryl Ranch:

We are pleased to submit the spring 2020 sediment quality results for Ken Caryl Ranch. Samples were collected on June 3, 2020. Results are shown in Table 1 (attached).

Sediment quality for this pond was considered to be fair. Most parameters are at or below acceptable levels or ranges (Table 1).

Overall, results demonstrated that the current state of the sludge matrix for the pond is fair and a proper management program will need to be implemented to improve the sediment quality to an optimal and relatively healthy condition. Considering the sediment results in comparison with the water quality results it is our recommendation to dredge the pond to achieve the desired result of improving the pond health. Dredging of the pond will remove many of the heavy metals in the sludge and also increase the overall health of the pond. Before moving forward with dredging, we would need to contact state and local authorities with regards to disposal of dredged material. Please feel free to call me if you have questions about the attached sediment quality results.

Sincerely,

ECORESOURCE SOLUTIONS, INC.

Jack Pritchett
Project Biologist

Attachment

TABLE 1. – Summary of sediment quality results from samples collected Ken Caryl Ranch pond, June 3, 2020(RLR = recommended level or range for optimal lake and fisheries management).

Sediment Quality Parameter	Result	RLR
Total Solids	20.189%	
Total Kjeidahl Nitrogen	0.606%	0.00 5
Phosphorus - Total	0.117%	0.00 5
Arsenic Total	2.0 mg/kg	340mg/kg
Lead Total	15.9 mg/kg	82mg/kg
Mercury Total	0.03 mg/kg	1.4mg/kg
Potassium Total	0.600%	0.00 8
Selenium Total	2.4 mg/kg	3-5 Ug/L

*Mg/L = Miligrams Per Liter or
PPM Ug/L Micrograms per liter
of PPB*