

## Waterways

Singular and combined risk treatments for Waterways are shown in Table 10 below.

**Table 10: Waterways Policy Options (risk treatments and combinations)**

Risk Treatments	Policy Options					
	Flood Mitigation Only	Flood Mitigation & LUB Provisions	Flood Mitigation, LUB Provisions & Limited Development below 250m	Flood Mitigation, LUB Provisions & Buyout Below 250m / Land Swap	LUB Provisions and Buyout Below 250m / Land Swap	Buyout all properties / Land Swap
Flood Mitigation Strategy	X	X	X	X		
Land Use Provisions		X	X	X	X	
No new (prospective) development below 250 m			X			
Buy out / land swap all properties below 250 m				X	X	
Buy out / land swap all properties in community						X

### Key Points

1. Structural flood mitigation is planned for this community (Reaches 10 & 11) but construction has not begun.
2. Flood mitigation is estimated to cost at least \$20 million. It is part of a larger project to tie into the Saline Creek Secondary Egress Road which is also anticipated to cost \$20 million, bringing the total cost of this project to approximately \$40 million.
3. Population is 232 as of the 2018 Census and consists of 164 private properties.
4. 94 private properties (48% of the total) are below the 250m elevation, of which 43 are developed.
5. 68 private properties (42% of the total) are above the 250m elevation, of which 48 are developed.
6. 140 private properties (90%) were affected during the Horse River Wildfire, of which 73 have rebuilt (45%).

**Table 11: Waterways Evaluation Matrix**

Evaluation Criteria		Weight	Policy Options Evaluation					
			Flood Mitigation Only	Flood Mitigation & LUB Provisions	Flood Mitigation, LUB Provisions, & Limited Development below 250m	Flood Mitigation, LUB Provisions, & Buyout Below 250m / Land Swap	LUB Provisions & Buyout Below 250m / Land Swap	Buyout all properties / Land Swap
Minimize Cost		4	5	5	5	8	1	4
Minimize Residual Risk	Social	1	6	5	4	2	3	1
	Built	1	6	5	4	2	3	1
	Economic	1	6	5	4	2	3	1
	Natural	1	6	5	4	3	2	1
Total Score			44	40	36	41	15	20
Total Treatment Cost			\$40M	\$40M	\$40M	\$75.5M	\$35.5M	\$72.3M
Flood Mitigation			\$20M	\$20M	\$20M	\$20M	~	~
Secondary Egress Road			\$20M	\$20M	\$20M	\$20M	~	~
Buyout Costs			~	~	~	\$25.5M	\$25.5M	\$56.7M
Reclamation Costs			~	~	~	\$10M	\$10M	\$15.6M
Total Cost Saved			~	~	~	~	\$40M	\$41M
Flood Mitigation			~	~	~	~	\$20M	\$20M
Secondary Egress Road			~	~	~	~	\$20M	\$20M
Landscaping Improvements			~	~	~	~	~	\$1M
Net Cost			\$40M	\$40M	\$40M	\$75.5M	\$0.00	\$31.3M
Net Cost Per Capita			\$533	\$533	\$533	\$1,007	\$0.00	\$417

**Table 12: Waterways Cost Scale**

Cost Bracket	Score	Cost Bracket	Score
< \$10 million	1	50 – 59 million	6
10 – 19 million	2	60 – 69 million	7
20 – 29 million	3	70 – 79 million	8
30 – 39 million	4	80 – 89 million	9
40 – 49 million	5	90 million +	10

## Proposed Approach for Waterways

1. According to Table 10, the proposed approach is **enhanced Land Use Bylaw Provisions and Buyout Below 250m** with the opportunity for a land swap. This option sees 94 properties removed from the flood hazard area, while 68 would remain on land that is above the 1:100 flood level. This option removes the properties most at risk of flooding. The Land Use Bylaw provisions should apply to a higher flood elevation (such as the 1:200) so that new development above the 250m can be afforded a higher degree of protection from a flood event that exceeds the 1:100.
2. Should the decision be made to proceed with the secondary egress road (which forms half of the \$40 million cost of flood mitigation for Waterways), then it would be fiscally responsible and still improves resilience to complete the other half of the flood mitigation at a cost of \$20 million. Therefore, a buyout would no longer be the proposed approach, and it may instead be prudent to **continue with the Municipality's structural flood mitigation project, in addition to limiting development below 250m, while at the same time introducing enhanced flood provisions in the Land Use Bylaw.**
3. Another proposed option is a **complete buyout of all properties**. This option may be considered for the following reasons:
  - i. It is the safest solution from a life-safety perspective. If the area was not fully bought out, residents on higher land would be without road access during a future 1:100 or higher flood event (roads leading to some portions of the community are below 250m and would be inundated by floodwaters). First responders would have difficulty accessing properties and would be putting their own lives in danger if the need to access a flooded property arose.
  - ii. The RMWB may choose not to proceed with the remainder of the planned flood mitigation in Waterways, budgeted at about \$20 million. **This would offset a portion of the buyout cost.** This cost saving excludes the tie-in to the Saline Creek Secondary Egress Road. Were this egress road to also be terminated, the cost savings would rise to \$40M, as the tie-in to that road would no longer be required.
  - iii. Existing underground infrastructure has outlived its life cycle and needs to be replaced. Further, after the 2016 Horse River Wildfire, there was discussion regarding the possibility of burying overhead power lines as is commonplace in other areas of Fort McMurray. Costs for this work have not been determined.
  - iv. Existing infrastructure will not need to be continually maintained to service the remaining population. Further, a partial buyout of the community may increase servicing and maintenance costs for underground infrastructure, as the current infrastructure is designed for larger volumes and may not adequately perform with lesser volume/flows.
  - v. A patchwork of remaining houses could be avoided, along with the associated disjointed appearance.
4. The proposed policy for Waterways is partial avoidance of flood risk by removing those exposed to 1:100-year flood events from the hazard area.
5. Potential future use of the areas bought out below 250m may include parkland. This new park space could be integrated into the current riverfront parkland.

6. If a complete buyout of all properties is pursued, opportunity exists for the Municipality to establish a sizeable festival ground or park space. Further opportunity exists to incorporate historical sites commemorating the shipping, rail and industrial heritage of Waterways.

**What degree of residual risk remains from overland flooding?**

1. Remaining residents will still be at risk from future floods, particularly if a flood event larger than a 1:100 occurs. Risk to property above 250m remains, and those residents may still experience difficulty obtaining flood insurance.
2. Little residual risk remains if a full buyout is pursued, as people and property would not be present in the hazard area.

**What was the cost of the risk reduction?**

1. Achieving this risk reduction carries a net \$15.5 million cost to taxpayers. The cost to implement the proposed option is a minimum of \$35.5 million to buy out properties below 250m and remediate the area, but this is offset by cost-savings in other areas. The buyout cost is based on 2020 assessed values only, not fair market value. This figure does not include the cost of procuring land for a land swap, as this is an optional step which may or may not be pursued; it therefore does not affect the evaluation of this risk treatment.
2. The net cost to implement the second proposed option is a minimum of \$51.3 million. This also does not include the cost of procuring land for a land swap as this is an optional step.
3. Reclamation costs are estimated to be about \$10 million, but one-third (nearly \$3 million) includes grading and landscaping. The grading and landscaping costs would depend on the future use of the area and could be avoided if the area were allowed to return to its natural state.
4. Reclamation costs for the second proposed option are estimated to be about \$15.5 million, but nearly \$3 million comprises grading and landscaping. Again, these costs would depend on the future use of the area and could be avoided if it were allowed to return to its natural state.
5. Cost savings would be realized as municipal services (water, sewer, road maintenance, garbage pick-up, etc.) need not be provided in future years.

**What new risks (if any) are generated by the risk treatment?**

1. No known new risks are created.

## Appendix F: Waterways

### 1. Demography:

Details	Municipal Census 2015	Municipal Census 2018
Population	667*	232*

**Note:** \* - Exact population of Waterways cannot be determined as the census data includes Ptarmigan Court.

### 2. General: Wildfire/Flood affected:

Sr. No.	Task	Total
1	Total Properties Analysed	224 (100%)
2	Total Private Properties	162 (72%)
3	Total Municipal Properties	62 (27%)
4	Wildfire unaffected (Empty Lots + developed)	55 (25%)
5	Wildfire affected	169 (75%)
6	Total No. of rebuilds from wildfire affected	73 (33%)
7	Total No. of properties signed agreements out of Total Rebuilds	16 (7%)
8	Waivers registered for signed agreements on Titles	0
9	Waiver Added in DP Condition	14 (6%)
10	Change in ownership for Waiver signed properties since Rebuilt	2 (1%)
11	Flood Effected	64 (29%)

### 3. Property Assessment:

Private Properties in Waterways Neighborhood				Assessment value
Details	Developed	Vacant	Total	
<b>Total Private Properties</b>	<b>91 (56%)</b>	<b>71 (44%)</b>	<b>162 (100%)</b>	<b>56,745,040</b>
Below 250 mt. contour level	43 (27%)	51 (31%)	94 (48%)	25,505,190
Above 250 mt. contour level	48 (30%)	20 (12%)	68 (42%)	31,239,850
<b>Properties Affected by Wildfire 2016</b>	<b>77 (48%)</b>	<b>68 (42%)</b>	<b>145 (90%)</b>	<b>50,781,330</b>
Below 250 mt. contour level	29 (18%)	48 (30%)	77 (48%)	19,541,480
Above 250 mt. contour level	48 (48%)	20 (12%)	68 (42%)	31,239,850
<b>Rebuilt</b>	<b>73 (45%)</b>	<b>0</b>	<b>73 (45%)</b>	<b>38,617,000</b>
Below 250 mt. contour level	28 (17%)	0	28 (17%)	13,068,930
Above 250 mt. contour level	45 (28%)	0	45 (28%)	25,548,070
<b>Properties Affected by Flood 2020</b>	<b>32 (20%)</b>	<b>32 (20%)</b>	<b>64 (40%)</b>	<b>18,397,830</b>
Below 250 mt. contour level	32 (20%)	32 (20%)	64 (40%)	18,397,830
Above 250 mt. contour level	0	0	0	0

**Note:** All % values are in reference of no. of total properties.

### 4. Total Property Assessment:

Sr. No.	Type	Status	Assessment Value	Total Assessment Value
1	Private	Undeveloped	10,053,610	<b>56,745,040</b>
		Developed	46,691,430	
2	Municipal		13,915,310	<b>13,915,310</b>
<b>Grand Total Assessment Value</b>				<b>70,660,350</b>

### 5. Reclamation Cost for Properties Below 250M Contour:

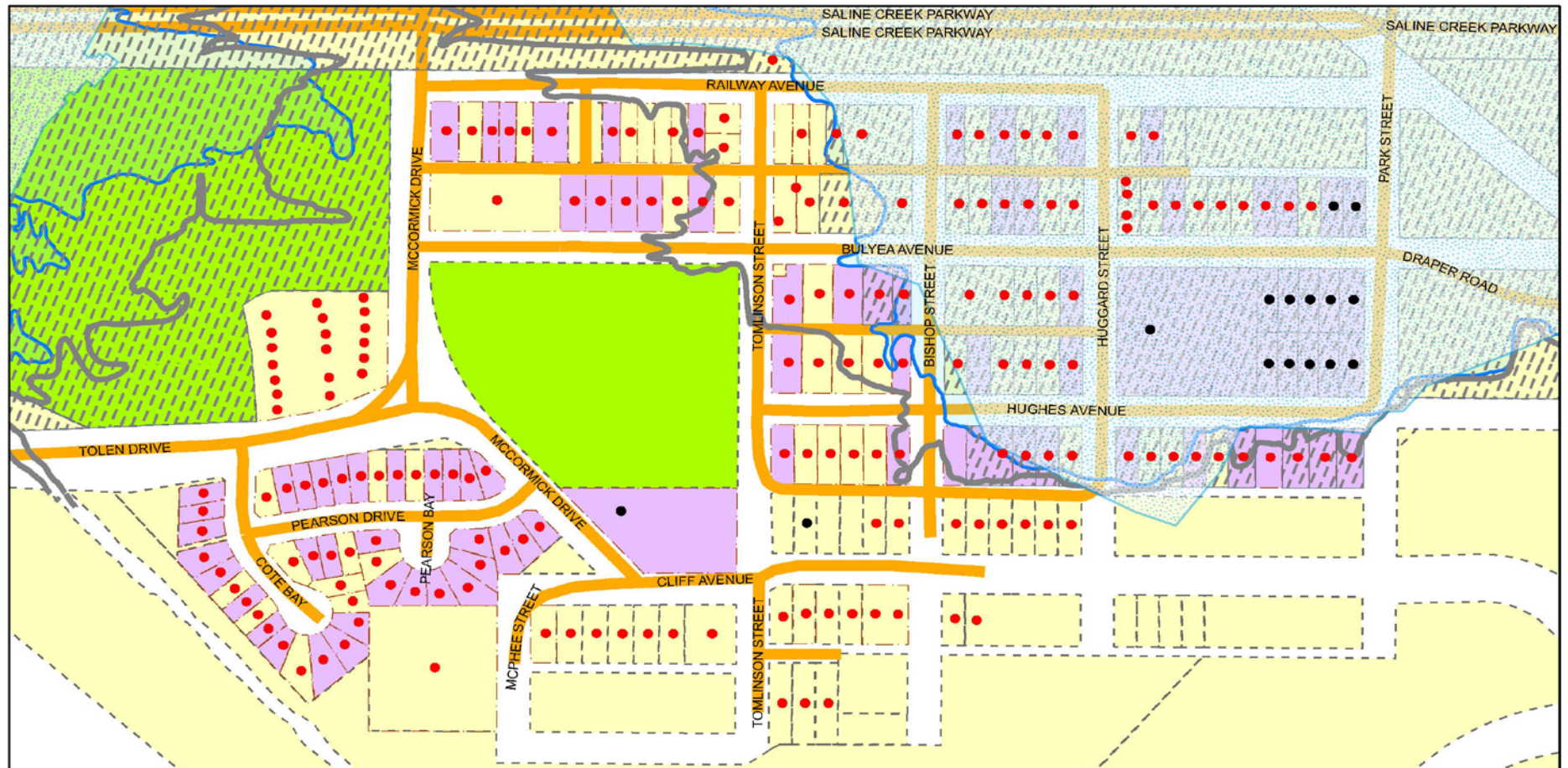
Sr. No	Item	Description	Quantity	Unit Measurement	Unit Rate	Total Cost
1	House Demo	House removal and disposal	38	each	\$60,000.00	\$2,280,000.00
2	Accessory/Building	Removal of accessory building	5	each	\$20,000.00	\$100,000.00
3	Cut and cap	Deep utility cut and capping at property line (Water and Sewer)	42	each	\$20,000.00	\$840,000.00
4		Cut and Cap for commercial at property line (Water and Sewer)	1	each	\$30,000.00	\$30,000.00
5	Pavement Structure Remove and Dispose	Removal of roadway pavement and base	14,000	sq.m	\$60.00	\$840,000.00
6	*Grading/Contouring	Levelling lots post demo and landscaping	141,000	sq.m	\$20.00	\$2,820,000.00
	TOTAL					\$6,910,000.00
	Engineering Fees	10%				\$691,000.00
	Contingency	10%				\$2,418,500.00
(D)	GRAND TOTAL					\$10,019,500.00

### 6. Average Assessment for Private Properties Below 250M Contour Level:

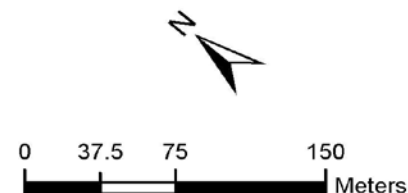
(A) Status	(B) Number of Properties	(C) Assessment Value	(D) Reclamation Cost	(C+D=E) Total Value	(E/B) Average Per Capita Value
Developed	43	\$19,284,330.00	\$10,019,500.00	\$29,303,830.00	\$681,484.42
Undeveloped	51	\$6,220,860.00	\$0.00	\$6,220,860.00	\$121,977.65
Total	94	\$25,505,190.00		\$35,524,690.00	\$377,922.23



## FLOOD EXTENT MAP FOR WATERWAYS



- |                                   |                                   |
|-----------------------------------|-----------------------------------|
| ● Destroyed (Wildfire)            | — Roads                           |
| ● Restricted Use (Wildfire)       | - - - Municipal Land              |
| ● Unsafe (Wildfire)               | - - - Private Land                |
| [Blue Hatched Box] Flood Extent   | [Purple Box] Developed Land       |
| [Grey Hatched Box] Flood Affected | [Green Box] Open-Space/Recreation |
| — 250 Meters Elevation            | [Yellow Box] Vacant Land          |
| [Blue Line] Flood Way             |                                   |



### 2020 FLOOD EXTENT WATERWAYS

Prepared By: Planning and Development

Created on: 22 May 2020



REGIONAL MUNICIPALITY  
OF WOOD BUFFALO



## 7. Reclamation Cost for Private Properties in Waterways:

Sr. No	Item	Description	Quantity	Unit Measurement	Unit Rate	Total Cost
1	House Demo	House removal and disposal	86	each	\$60,000.00	\$5,160,000.00
2	Accessory/Building	Removal of accessory building	5	each	\$20,000.00	\$100,000.00
3	Cut and cap	Deep utility cut and capping at property line (Water and Sewer)	90	each	\$20,000.00	\$1,800,000.00
4		Cut and Cap for commercial at property line (Water and Sewer)	1	each	\$30,000.00	\$30,000.00
5	Pavement Structure Remove and Dispose	Removal of roadway pavement and base	14,000	sq.m	\$60.00	\$840,000.00
6	*Grading/Contouring	Levelling lots post demo and landscaping	141,000	sq.m	\$20.00	\$2,820,000.00
	TOTAL					\$10,750,000.00
	Engineering Fees	10%				\$1,075,000.00
	Contingency	10%				\$3,762,500.00
(D)	GRAND TOTAL					\$15,587,500.00

## 8. Average Assessment for Private Properties in Waterways:

(A) Status	(B) Number of Properties	(C) Assessment Value	(D) Reclamation Cost	(C+D=E) Total Value	(E/B) Average Per Capita Value
Developed	91	\$46,691,430.00	\$15,587,500.00	\$62,278,930.00	\$684,383.85
Undeveloped	71	\$10,053,610.00	\$0.00	\$10,053,610.00	\$141,600.14
Total	162	\$56,745,040.00		\$72,332,540.00	\$446,497.16