

ABOUT COMBINED SEWER OVERFLOWS (CSOs)

Combined sewers are designed to carry household sewage, rainwater runoff and snowmelt in the same sewer pipe. Most of the time, combined sewers transport all of the wastewater to the City's sewage treatment plants, where it is treated and released into the river. This type of sewer services about one third of the city (by area).

These sewers are designed to spill excess flow directly into the river during heavy rainfalls or snowmelt. This helps prevent basement flooding and is known as a combined sewer overflow (CSO).

ON AVERAGE, CSOs OCCUR ABOUT 22 TIMES DURING THE YEAR AT EACH SEWER DISTRICT.

ABOUT THE CSO MASTER PLAN

IN ORDER TO SATISFY PROVINCIAL LEGISLATION, WE ARE DEVELOPING A CSO MASTER PLAN TO LIMIT CSOS AND PROTECT RIVER QUALITY

The control limits under consideration:

- 85% Capture in an Average Rainfall Year
- Four Overflows in an Average Rainfall Year
- Zero Overflows in an Average Rainfall Year
- No more than Four Overflows per Year
- Complete Sewer Separation

WE ARE REQUIRED TO SUBMIT A REPORT TO THE PROVINCE OF MANITOBA BY *DECEMBER 31, 2015*

THAT ASSESSES AND EVALUATES THESE CSO CONTROL LIMITS.

Once a control limit has been set, we will begin the next stage of the CSO Master Plan, which will outline our plan to meet those limits.

CONTROLLING CSOs

- **WILL NOT MAKE RIVER WATER DRINKABLE.**
It will still require treatment prior to consumption.
- **WILL NOT MAKE THE RIVER SAFE FOR SWIMMING.**
The river has fast currents, cloudy water, and slippery, muddy banks that make it unsafe for swimming.
- **WILL NOT IMPACT FISHING.**
The fish caught in our rivers are safe to eat once thoroughly cooked.
- **WILL NOT AFFECT THE RIVER'S COLOUR.**
Winnipeg's rivers are naturally murky brown in appearance due to our clay based soil.
- **WILL NOT CHANGE RIVER CHEMISTRY (AMMONIA AND DISSOLVED OXYGEN).**
The ecosystem will not be impacted.

EVALUATION OF CRITERIA

WHICH CRITERIA DO YOU FEEL ARE THE MOST IMPORTANT IN EVALUATING CONTROL LIMIT OPTIONS?

River Usability

A control limit's impact on the water quality, bacteria levels, public health, odour, aesthetics recreation, etc. in Winnipeg rivers

PLACE STICKER IN BOX

Value for Cost & Affordability

A control limit's cost and the impact on future utility bills

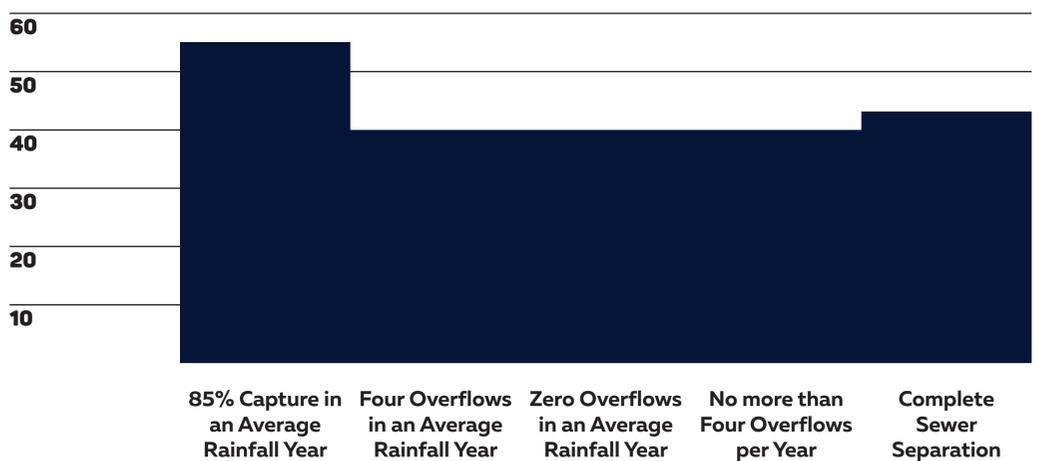
PLACE STICKER IN BOX

Lake Winnipeg

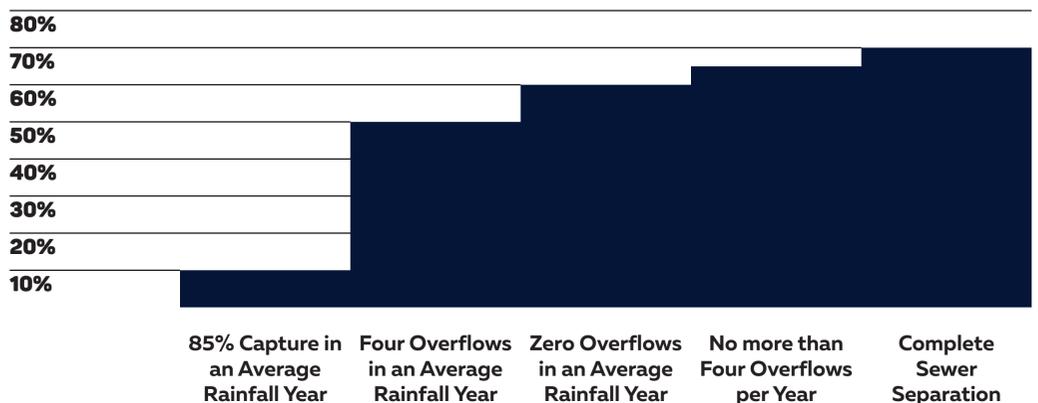
A control limit's impact on the health of Lake Winnipeg and the watershed

PLACE STICKER IN BOX

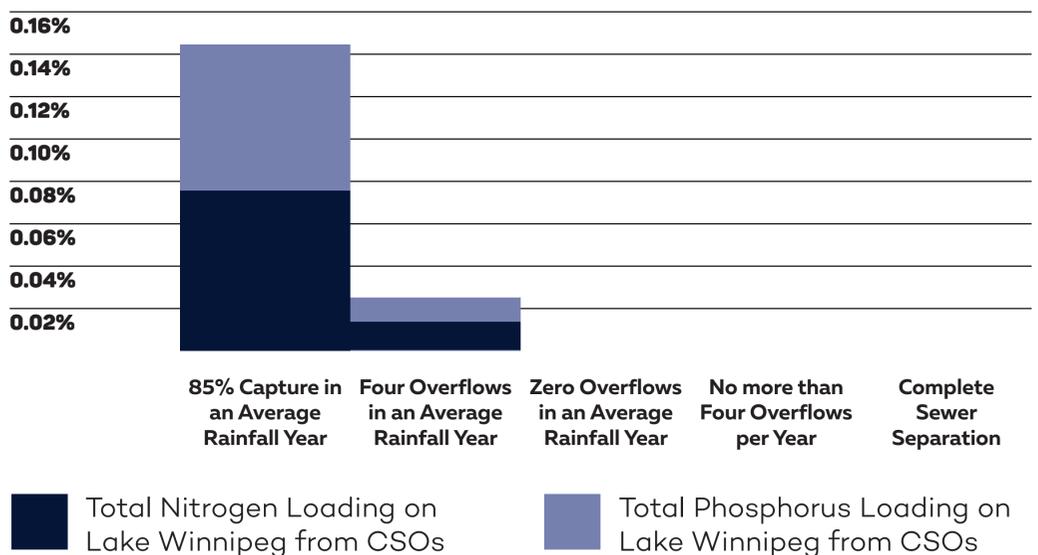
DAYS OF EXCEEDANCE FOR E.COLI



POTENTIAL INCREASE TO AVERAGE RESIDENTIAL UTILITY BILL



TOTAL NITROGEN/PHOSPHORUS LOADING ON LAKE WINNIPEG FROM CSOs



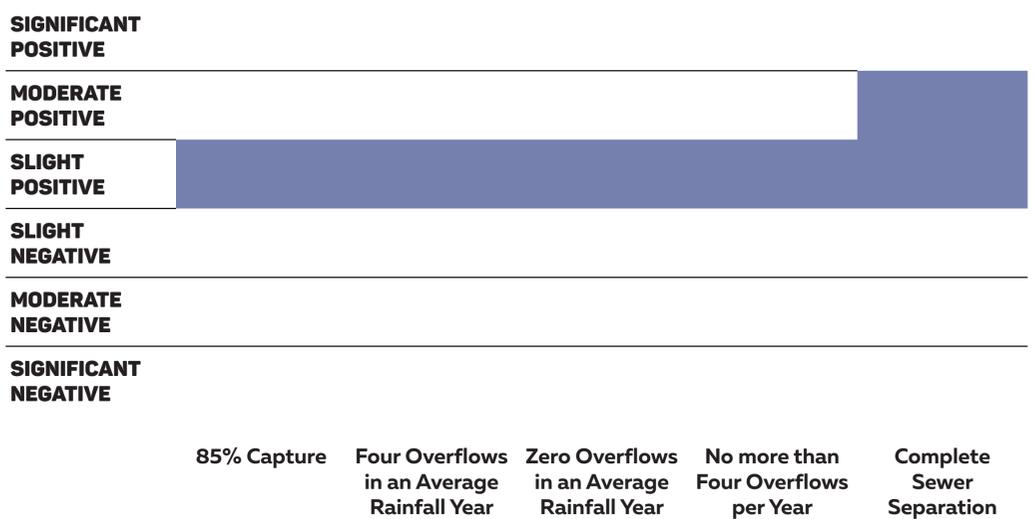
EVALUATION OF CRITERIA

WHICH CRITERIA DO YOU FEEL ARE THE MOST IMPORTANT IN EVALUATING CONTROL LIMIT OPTIONS?

Visionary & Broader Context

A control limit's impact on other City projects and priorities now and in the future

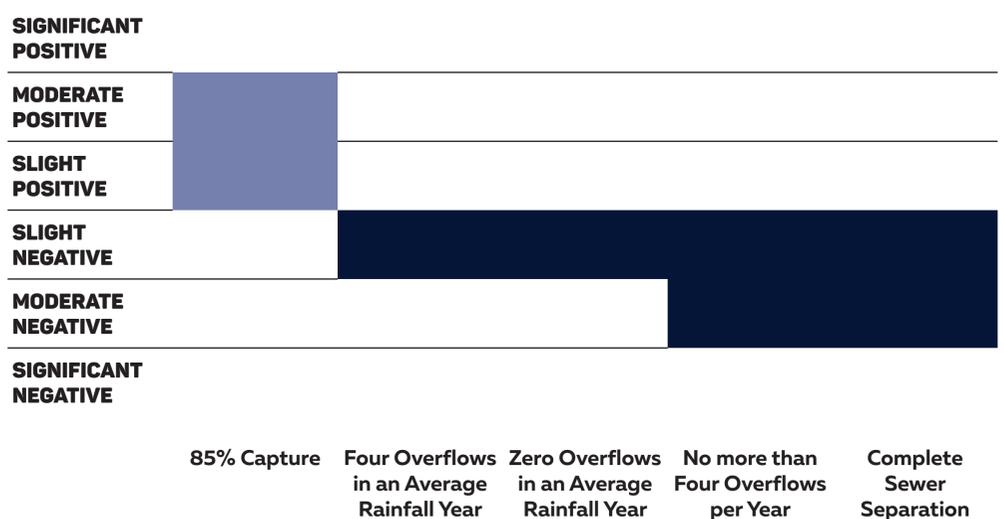
PLACE STICKER IN BOX



Economic Sustainability & Construction Capacity

A control limit's impact on the economy and our ability to complete it efficiently

PLACE STICKER IN BOX



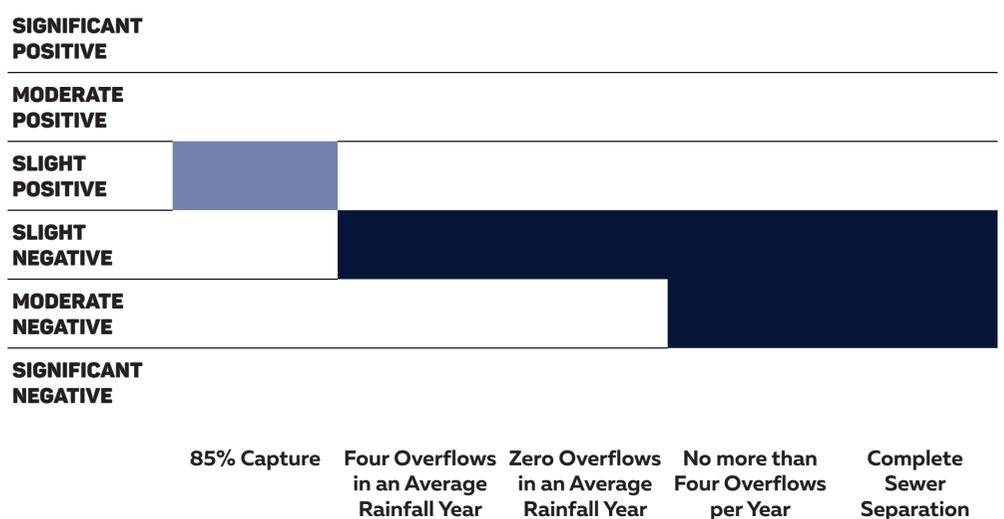
EVALUATION OF CRITERIA

WHICH CRITERIA DO YOU FEEL ARE THE MOST IMPORTANT IN EVALUATING CONTROL LIMIT OPTIONS?

Livability

A control limit's impact on the lives of citizens during and post construction

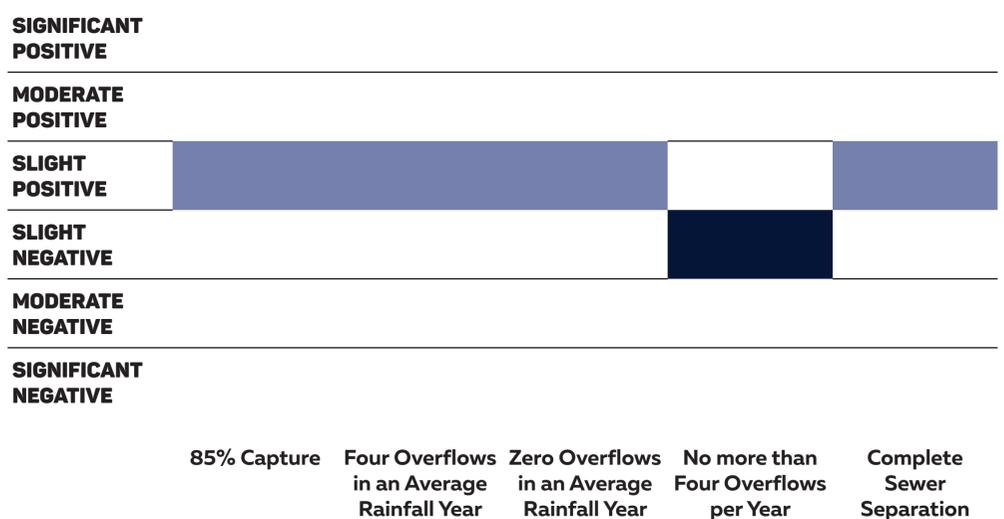
PLACE STICKER IN BOX



Innovation & Transformation

A control limit's impact on the quality of life in Winnipeg

PLACE STICKER IN BOX



CURRENT APPROACH TO OVERFLOWS

CURRENT INFRASTRUCTURE IMPROVEMENT PROGRAM.

Sewer Performance

NUMBER OF OVERFLOWS:

939 total overflows over 63 overflow events per year

VOLUME OF OVERFLOW:

Total 4,549,197 m³ is released to the rivers

SEWAGE TREATED (%)

78%

River Usability

BACTERIA LEVELS FOR RIVER RECREATION:

Unsafe bacteria levels on the river exceed 44 days/year.

Value for Cost & Affordability

\$0.2-0.5 billion, no change in average residential utility bill

Lake Winnipeg

14,142 kg of phosphorus will be added to Lake Winnipeg annually, which is approximately 0.24% of all phosphorus added to the lake

81,205 kg of total nitrogen will be added to Lake Winnipeg annually, which is approximately 0.13% of all total nitrogen added to the lake

85% CAPTURE IN AN AVERAGE RAINFALL YEAR

IMPROVEMENTS TO MAXIMUM COST / BENEFIT POINT - MINIMUM 85% SEWAGE CAPTURED AND TREATED IN AN AVERAGE RAINFALL YEAR

Sewer Performance

NUMBER OF OVERFLOWS:

707 total overflows over 63 overflow events per year

VOLUME OF OVERFLOW:

Total 2,978,043 m3 is released into the rivers

SEWAGE TREATED (%)

85%

Value for Cost & Affordability

\$0.6-1.2 billion, 10% increase in average residential utility bill

Lake Winnipeg

8,459 kg of phosphorus will be added to Lake Winnipeg annually, which is approximately 0.14% of all phosphorus added to the lake

48,571 kg of total nitrogen will be added to Lake Winnipeg annually, which is approximately 0.08% of all total nitrogen added to the lake

River Usability

BACTERIA LEVELS FOR RIVER RECREATION:

Unsafe bacteria levels on the river exceed 44 days/year with no notable improvement on current conditions

IMPACT ON YOUR PRIORITIES

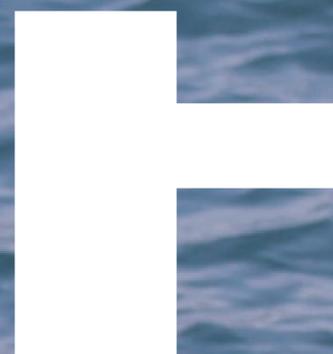
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Visionary & Broader Context

Economic Sustainability & Construction Capability

Liveability & Daily Impacts

Innovation & Transformation



FOUR OVERFLOWS IN AN AVERAGE RAINFALL YEAR

CONTROL OVERFLOWS TO FOUR OVERFLOWS PER DISTRICT IN AN AVERAGE RAINFALL YEAR

Sewer Performance

NUMBER OF OVERFLOWS:

160 total overflows over 12 overflow events per year, averaging out to 4 overflows for each sewer district

VOLUME OF OVERFLOW:

Total 470,155 m³ is released into the rivers

SEWAGE TREATED (%)

98%

River Usability

BACTERIA LEVELS FOR RIVER RECREATION:

Unsafe bacteria levels on the river exceed 41 days/year – a three day improvement on current conditions

Value for Cost & Affordability

\$1.2-2.6 billion, 50% increase in average residential utility bill

Lake Winnipeg

1,442 kg of phosphorus will be added to Lake Winnipeg annually, which is approximately 0.02% of all phosphorus added to the lake

8,282 kg of total nitrogen will be added to Lake Winnipeg annually, which is approximately 0.01% of all total nitrogen added to the lake

IMPACT ON YOUR PRIORITIES

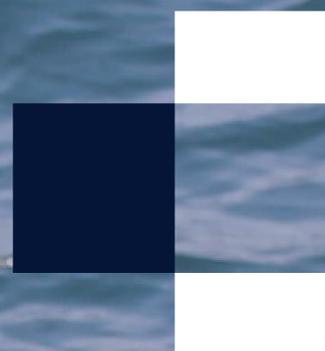
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ZERO OVERFLOWS IN AN AVERAGE RAINFALL YEAR

ZERO OVERFLOWS FOR AN AVERAGE RAINFALL YEAR, WITH POTENTIAL FOR SOME YEARS WITH INFREQUENT OVERFLOWS DURING EXTREME WEATHER CONDITIONS

Sewer Performance

NUMBER OF OVERFLOWS:

Zero overflows for an average rainfall year, but with potential for infrequent overflows during extreme weather conditions.

VOLUME OF OVERFLOW:

There will be no overflows into our rivers in an average rainfall year and minimal volume during extreme weather conditions

SEWAGE TREATED (%)

Nearly 100%

River Usability

BACTERIA LEVELS FOR RIVER RECREATION:

Unsafe bacteria levels exceed 35 days/year – a nine day improvement on current conditions

Value for Cost & Affordability

\$1.5-3.3 billion, 60% increase in average residential utility bill

Lake Winnipeg

0 kg of phosphorus will be added to Lake Winnipeg with minimal phosphorus added during extreme weather conditions.

0 kg of total nitrogen will be added to Lake Winnipeg with minimal total nitrogen added during extreme weather conditions

IMPACT ON YOUR PRIORITIES

SIGNIFICANTLY NEGATIVE MODERATE NEGATIVE SLIGHT NEGATIVE SLIGHT POSITIVE MODERATE POSITIVE SIGNIFICANTLY POSITIVE

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NO MORE THAN FOUR OVERFLOWS PER YEAR

NO MORE THAN FOUR OVERFLOW EVENTS PER YEAR DEPENDENT ON WET WEATHER EVENTS

Sewer Performance

NUMBER OF OVERFLOWS:

Ranging from zero to a maximum of four overflow events per year

VOLUME OF OVERFLOW:

There will be no overflows in an average rainfall year and minimal overflow dependent on wet weather conditions

SEWAGE TREATED (%)

Nearly 100%

River Usability

BACTERIA LEVELS FOR RIVER RECREATION:

Unsafe bacteria levels exceed 39 days/year – a five day improvement on current conditions

Value for Cost & Affordability

\$1.7-3.7 billion, 65% increase in average utility bill

Lake Winnipeg

No phosphorus will be added to Lake Winnipeg with minimal phosphorus added during wet weather conditions

No total nitrogen will be added to Lake Winnipeg with minimal total nitrogen added during wet weather conditions

IMPACT ON YOUR PRIORITIES

SIGNIFICANTLY
NEGATIVE

MODERATE
NEGATIVE

SLIGHT
NEGATIVE

SLIGHT
POSITIVE

MODERATE
POSITIVE

SIGNIFICANTLY
POSITIVE

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COMPLETE SEWER SEPARATION

ALL STREET FLOW AND LAND DRAINAGE DISCONNECTED FROM SANITARY SEWERS

Sewer Performance

NUMBER OF OVERFLOWS:

Zero as combined sewers are eliminated

VOLUME OF OVERFLOW:

Zero as combined sewers are eliminated

SEWAGE TREATED (%)

100%

River Usability

BACTERIA LEVELS FOR RIVER RECREATION:

Unsafe bacteria levels exceed 42 days/year – a two day improvement on current conditions

Value for Cost & Affordability

\$1.9-4.1 billion, 70% increase in average utility bill

Lake Winnipeg

There will be 0 kg of phosphorus added to Lake Winnipeg

There will be 0 kg of total nitrogen added to Lake Winnipeg

IMPACT ON YOUR PRIORITIES

SIGNIFICANTLY NEGATIVE MODERATE NEGATIVE SLIGHT NEGATIVE SLIGHT POSITIVE MODERATE POSITIVE SIGNIFICANTLY POSITIVE

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