



LEVEL OF SERVICE REVIEW

St. Clair River

2005



CANADIAN COAST GUARD PRESCOTT

LEVEL OF SERVICE REVIEW OF THE CANADIAN WATERS IN THE

ST. CLAIR RIVER

Level of Service Statement

The following describes the marine aids-to-navigation service provided by the Canadian Coast Guard (CCG) in the Canadian sections of the confined waters of the St. Clair River from Light X32/2 at the lower end of St. Clair Cutoff to Point Edward range lights at Lake Huron. Note both the CCG and the United States Coast Guard (USCG) maintain their respective portions of this system. This statement concerns only the aids in Canadian waters.

General

The CCG provides aids to navigation at this site to mark or warn of underwater hazards and to mark the shipping channel to a depth of 27 feet (8.2 m) at chart datum. Small vessel channels are marked to a depth of 18 feet (5.5 m) or greater at chart datum. Mariners should use charts and consider weather conditions to ensure sufficient under-keel clearance and safe passage.

The CCG has designed the marine aids system to assist navigation by certified commercial vessels (CAT I) users until visibility falls below 2.2 nautical miles. Radar targets support navigation when poor weather reduces visibility to less than 2.2 nautical miles. The system supports navigation by uncertified commercial vessels (CAT II) and pleasure craft (CAT III) users until visibility falls below 5.4 nautical miles.

Vessels not equipped with radar may be at unacceptable risk in reduced visibility and should not proceed without local knowledge if safe anchorage is available.

Fixed structures or bifurcation buoys separate channels in the upbound direction. Fixed structures or cardinal buoys separate channels for downbound traffic. In U.S. waters, the USCG uses fixed structures or junction buoys in both directions.

Certified Commercial Vessels (CAT I)

The site supports daytime navigation by providing ranges marking channel centerlines; by fixed structures or buoys marking relevant hazards, turns, and channel boundaries; and by radar targets. Radar targets, lights, and reflective material on ranges, structures, and buoys support nighttime navigation.

Uncertified Commercial Vessels (CAT II), Pleasure Craft (CAT III), and Ferries

The site supports daytime navigation for these users by providing buoys marking relevant hazards, turns, and channel boundaries. Reflective material on buoys provides support for nighttime navigation. Some ferries to operate year round weather permitting.

St. Clair River – General Description

The St. Clair River is about 39 miles (72 kilometres) long from light X32/2 in the St. Clair Cutoff Channel at Lake St. Clair to Point Edward Front Range on Lake Huron at Sarnia.

The lower 18 kilometres of the river is a broad delta where numerous channels flow into Lake St. Clair. South Channel and St. Clair Cutoff Channel form the main navigation route and connect with the dredged channel across Lake St. Clair. The upper river, above Chenal Ecarte, is generally a single deep channel. The only exceptions are at Fawn Island and Stag Island where secondary channels pass on the east side of the islands. The banks of the river are clay and sand and usually quite steep. The federal project depth in the dredged channel through St. Clair River is 27 feet (8.2 m).

The Canadian Coast Guard operates a vessel traffic service in Canadian waters from Long Point in Lake Erie through The Detroit and St. Clair Rivers to Detour Reef Light in Lake Huron. The waters of the St. Clair River are Great Lakes designated waters. Registered vessels are required to have in their service a U.S. or Canadian registered pilot.

Each year the St. Clair River has a seasonal rise and fall of about 1 foot, generally in consonance with the seasonal variations of Lake Huron. High winds may cause rapid fluctuations of up to 2 feet (0.6 m) above or below normal.

The current in the St. Clair River is fast at times ranging from a low of 1.1 knots at Marysville in low water periods to a high of 3.4 knots at Point Edward in high water periods. The rapids section extends from about 300 meters above to 100 meters below the Blue Water Bridge. During periods of sustained high N to NE winds on Lake Huron, velocities in the upper St. Clair River are increased.

Because the current is fast, the only need for ice breaking is when the ice bridge that forms across the south end of Lake Huron breaks and the broken mass of ice travels down the river to the lower end where it meets the natural ice cover and forms a massive ice jam. When this occurs, ice can clog the entire 27-foot depth of the channel and cause serious flooding.

The State of Michigan enforces speed limits for recreational craft within its jurisdictional boundaries from the mouth of the Black River downstream to the mouth of the St. Clair River. Vessels less than 8 meters long within 60 meters of any shore, dock, or pier must transit slowly and not leave behind a wake. Vessels 8 meters or longer within 185 meters of any shore, dock, or pier must transit slowly and not leave behind a wake.

Local populations on or near St. Clair River are concentrated at its head near Lake Huron. The combined population of Sarnia (70,000) and Port Huron (32,000) is slightly more than 100,000. Smaller communities have settled along the length and on both sides of the river. In addition to local traffic, commercial and pleasure craft destinations ranging from Lake Superior to overseas ports add significantly to the activity at this site.

ESTIMATED TRAVEL TIMES - DETROIT & ST. CLAIR RIVER SYSTEM

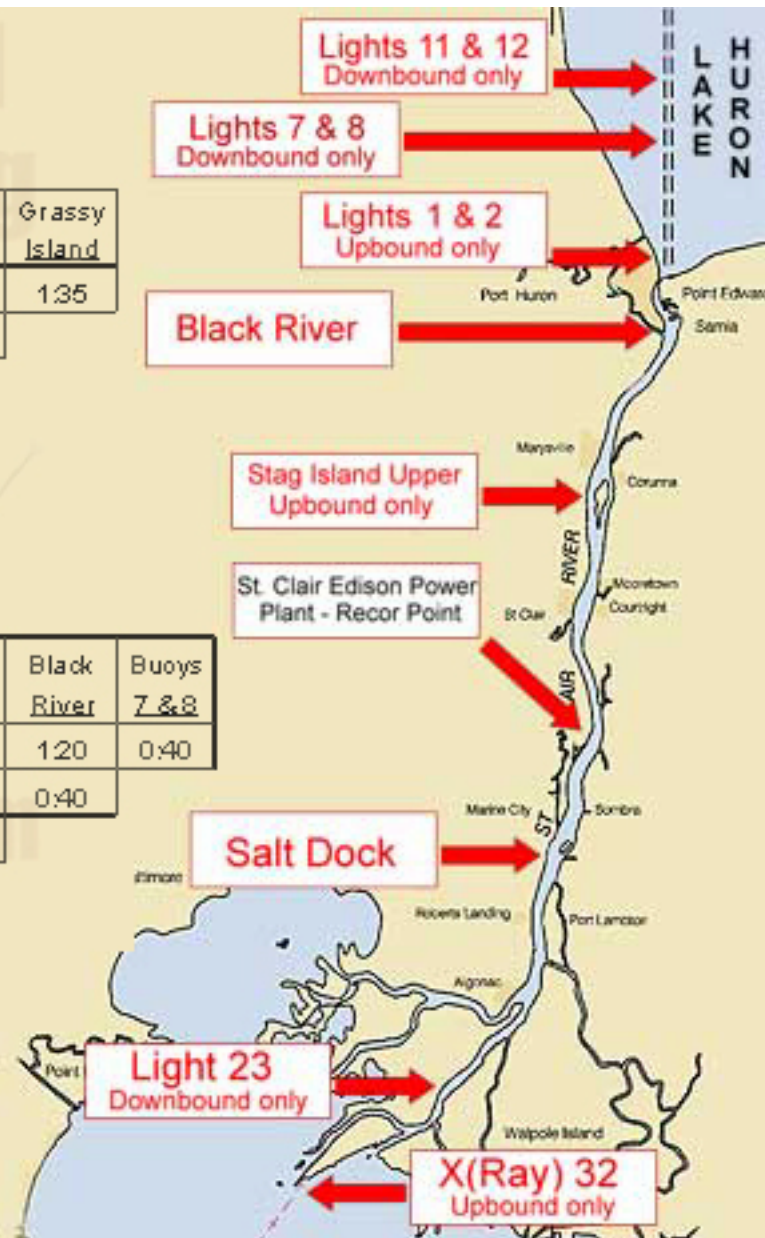
CALLING-IN POINTS FOR "SARNIA TRAFFIC"

Times shown as Hours:Minutes

UP BOUND	Buoys 1 & 2	Black River	Stag Island	Salt Dock	Light X-32	St. Clair Crib	Grassy Island
Detroit River Light	8:10	7:50	7:20	6:00	4:20	4:00	1:35
Grassy Island	7:25	7:05	6:35	4:15	2:45	2:25	
St. Clair Crib Light	4:10	3:50	3:20	2:00	0:20		
Light X-32	3:50	3:30	3:00	1:40			
Salt Dock	2:10	1:50	1:20				
Stag Island Upper	0:50	0:30					
Black River	0:20						

DOWN BOUND	Detroit River Light	Grassy Island	Belle Isle	St. Clair Crib	Light 23	Salt Dock	Black River	Buoys 7 & 8
30 Min. to 11 & 12	9:05	7:35	6:25	5:10	3:55	3:10	1:20	0:40
Buoys 7 & 8	8:15	6:55	5:45	4:30	3:15	2:30	0:40	
Black River	7:45	6:15	5:05	3:50	2:35	1:50		
Salt Dock	5:55	4:25	3:15	2:00	0:45			
Light 23	5:10	3:40	2:30	1:15				
St. Clair Crib Light	3:55	2:25	1:15					
Belle Isle USCG	2:40	1:10						
Grassy Island	1:30							

Note that Calling-in Points are NOT the same for up bound and down bound.



Availability / Visibility / Weather

A.E.S weather is available at Sarnia Ontario. The worst month for visibility is January for the category I commercial vessels who navigate year round. Visibility in January is below 5.4 nautical miles 27% of the time and below 2.2 miles 14.5% of the time. Snowfall and sea smoke are the most likely causes of reduced visibility in January.

August is the worst month for category II commercial vessels and pleasure craft during their shorter seasons. Pleasure craft normally operate from May to October while category II commercial vessels may operate from April to December depending on the weather. Visibility in August is below 5.4 miles 20.1% of the time and below 2.2 miles just 8.0% of the time.

Strong winds are most likely during fall, winter, and spring. In the winter months, the area often encounters southwest winds. Extremes often occur in squall lines or thunderstorms. The highest sustained wind speed recorded at Sarnia during the review's 14-year weather history was over 42 knots from the north by northwest January 14, 1992 at 10:00 AM. Winds along the river blow mainly out of the north, but other directions are common. Sarnia recorded a sustained wind from the south at over 30 knots June 17, 1992 between 3:00 PM and 6:00 PM. Easterly winds are not so frequent.

Visibility and wind data is current. The report uses Environment Canada historical data at Sarnia for the 14-year period from 1990 through 2003.

Water level information comes from the U.S. Center for Operational Oceanographic Products and Services. The report uses historical water level information from station #9014080, St Clair State Police, Michigan. This data also covers the 14-year period from 1990 to 2003. Historical water level data between January 1996 and August 1996 was not available.

Recent wave height and ice conditions data are not available for the St. Clair River. The most recent Environment Canada wave and ice data are from the period between 1959 and 1988.

Visibility

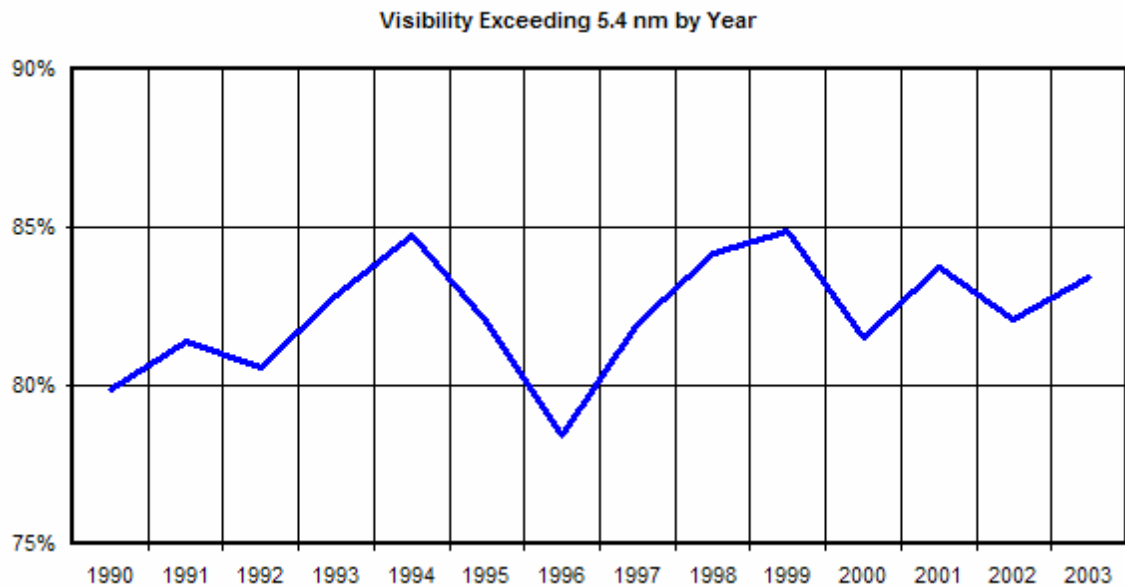
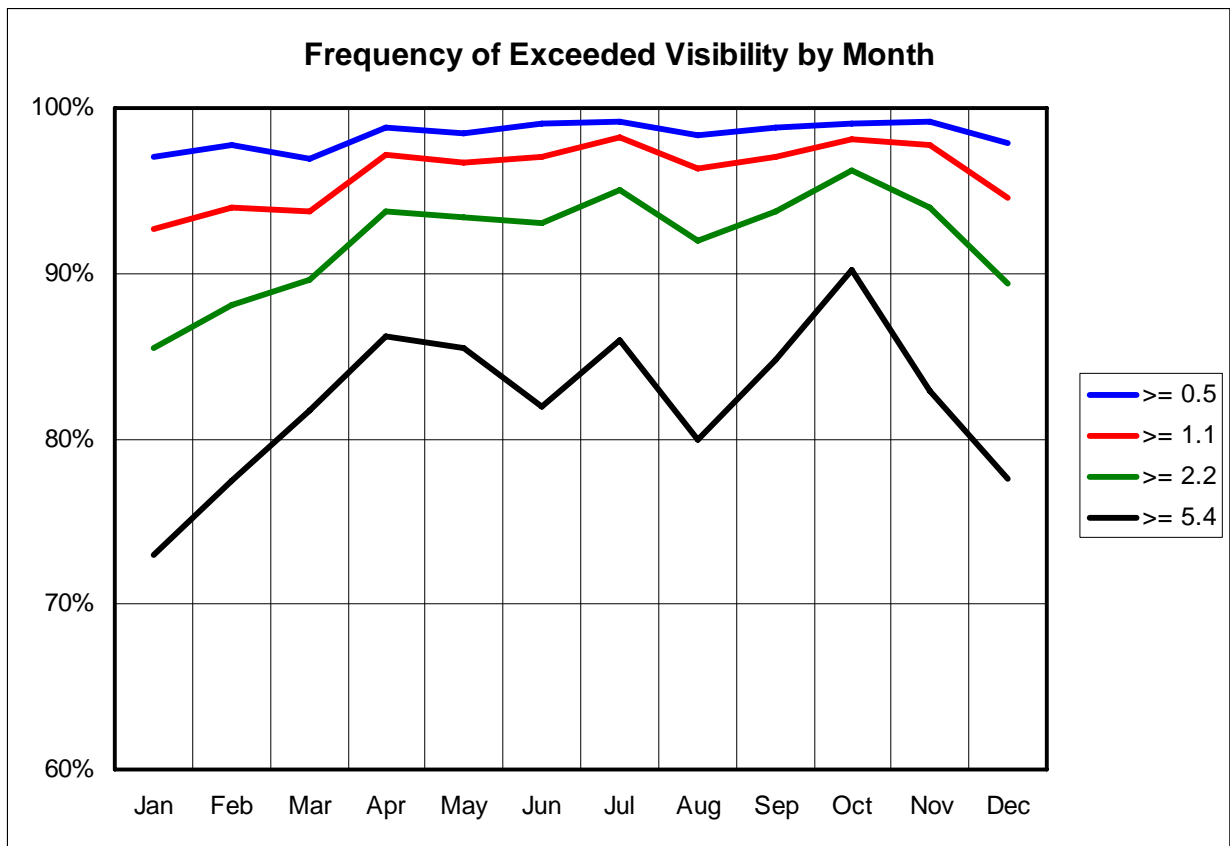
14-Year Frequency of Exceeded Visibility					Number of Readings	
	>= 0.5	>= 1.1	>= 2.2	>= 5.4	Readings	Missed
January	97.10%	92.70%	85.50%	73.00%	4,509	5,907
February	97.80%	94.00%	88.10%	77.50%	4,111	5,369
March	97.00%	93.70%	89.60%	81.70%	4,511	5,905
April	98.80%	97.20%	93.70%	86.20%	4,342	5,738
May	98.40%	96.80%	93.40%	85.50%	4,497	5,919
June	99.10%	97.00%	93.10%	81.90%	4,389	5,691
July	99.20%	98.20%	95.00%	86.00%	4,454	5,962
August	98.30%	96.40%	92.00%	79.90%	4,389	6,027
September	98.80%	97.10%	93.80%	84.70%	4,229	5,851
October	99.10%	98.20%	96.20%	90.20%	4,368	6,048
November	99.20%	97.80%	94.00%	82.90%	4,334	5,746
December	97.80%	94.50%	89.40%	77.60%	4,486	5,930
Totals					52,619	70,093
%					42.88%	57.12%

Actual visibility readings at Sarnia for the period between 1990 and 2003 were taken between the hours of 6:00 AM and 4:00 PM. The missed readings shown on the above chart primarily reflect the 14 hours daily during which time readings were not taken.

For certified commercial vessels using the system year round, the worst month for visibility is January. Because the visibility in December and January is greater than or equal to 5.4 nautical miles less than 75% of the time, the CCG will design the main shipping channels of this system to 2.2 nautical miles.

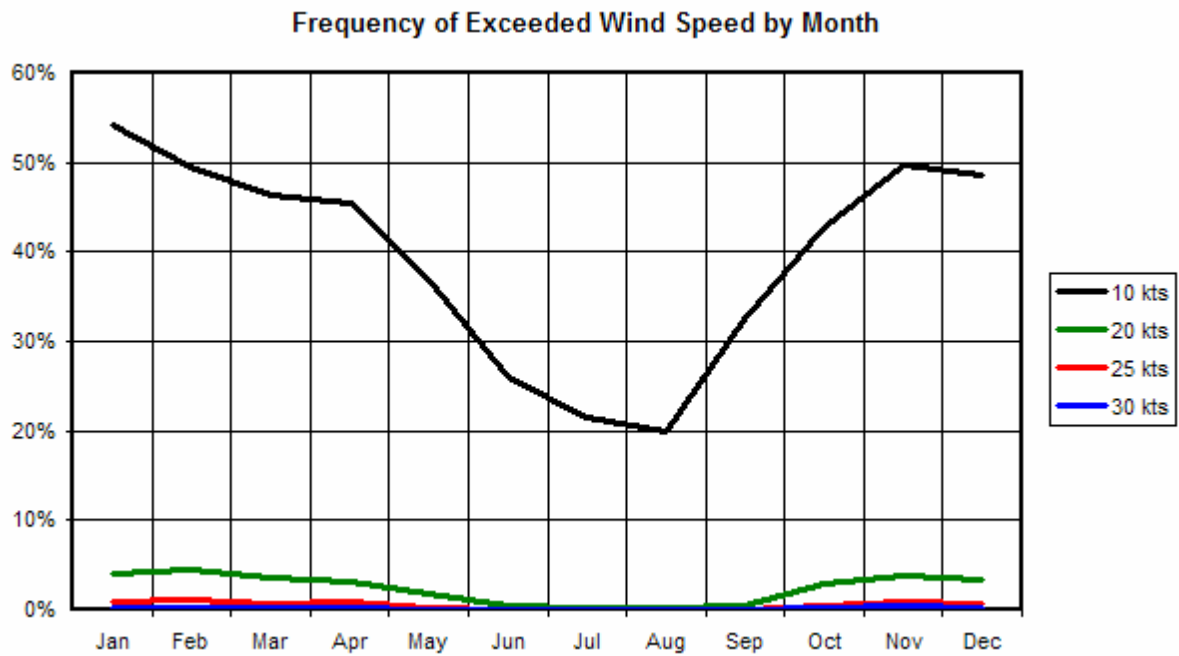
Seasonal operators will find the worst month for visibility is August. The CCG will support the small craft channels (and any aids placed in the main channels specifically for smaller vessels) to a designed distance of 5.4 nautical miles.

Visibility Charts by Month and by Year (14-year period)

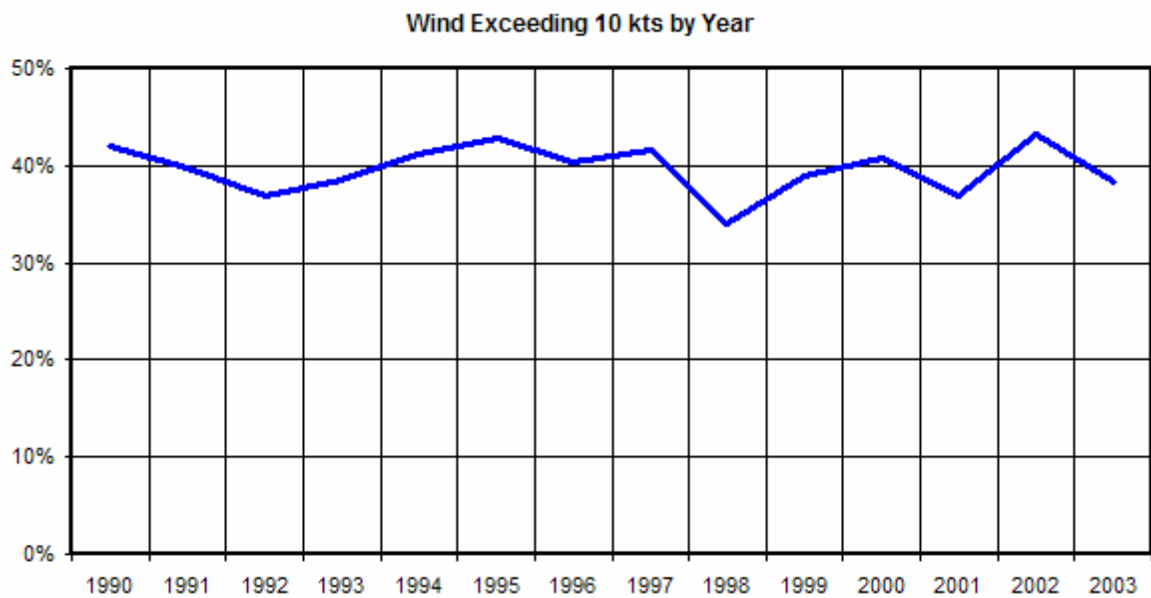


Year to year visibility data show no particular trend.

Wind



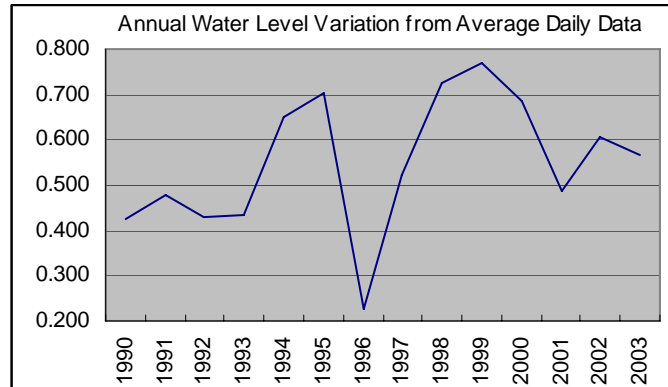
The winter months are clearly the windiest in this area.



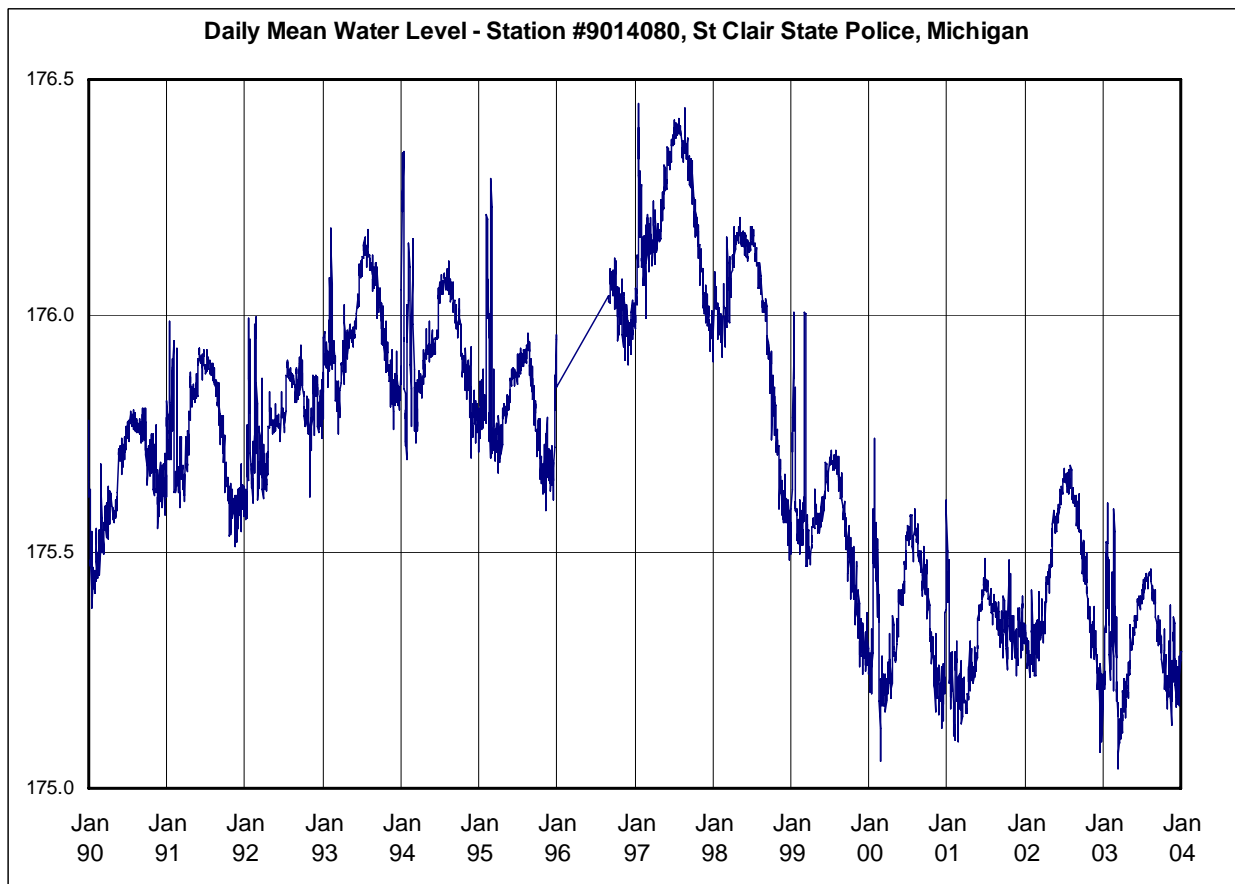
Year to year wind data for the period is relatively steady and consistent.

Water Level Fluctuations

Each year the St. Clair River has a seasonal rise and fall of about 1 foot (0.3 m) generally with the seasonal variations of Lake Huron. High winds may cause rapid fluctuations of up to 2 feet (0.6 m) above or below normal.



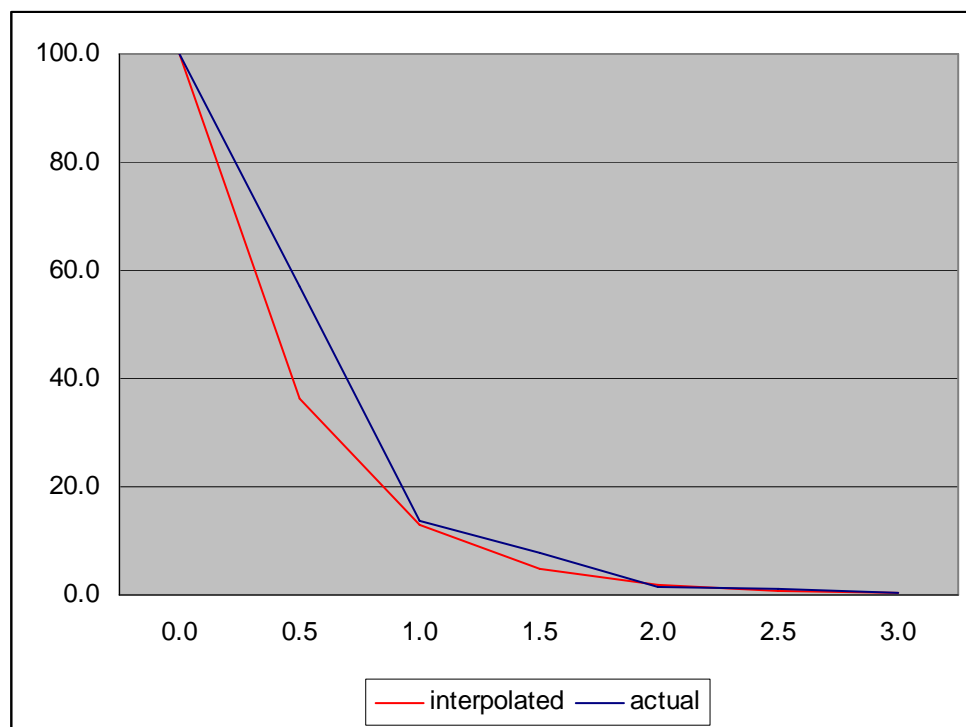
Water levels had been gradually rising to a peak in mid 1997. By the end of 1999, water levels had fallen to below 1990 levels. The range for the full 14-year period is 1.4 meters.



Wave Height

Wave height data from Environment Canada between 1959 and 1988 indicates that mariners in the St. Clair River may experience waves in excess of one meter as much as 13.8% of the time. This means that some vessels, particularly smaller ones, may occasionally have trouble manoeuvring or navigating due to wave heights. Generally, ten percent occurrence is where the threat becomes significant.

The preliminary threat-rating sheet uses 1.5 meters as a threat level for some vessels. However, Environment Canada arranges the data in one-meter intervals so interpolation is required. Since wave heights are greater than one meter only 13.8% of the time and smaller waves are more likely than larger, wave heights of greater than 1.5 meters are likely to occur below the ten percent frequency rate. Using a simple formula and the three given wave height exceeded frequencies, we can create estimated and interpolated half-meter values. This method shows that wave heights of 1.5 meters or greater should occur approximately 4.8% of the time.



ENVIRONMENT CANADA

ATMOSPHERIC ENVIRONMENT SERVICE

CANADIAN CLIMATE CENTRE

ENVIRONNEMENT CANADA

SERVICE DE L'ENVIRONNEMENT ATMOSPHERIQUE

CENTRE CLIMATOLOGIQUE CANADIEN

PERCENTAGE FREQUENCY OF COMBINED WAVE HEIGHT BY DIRECTION

FREQUENCE EN POURCENTAGE DE LA HAUTEUR COMBINEE DES VAGUES PAR DIRECTION

JAN 1 - DEC 31

1959 - 1988

1ER JANV AU 31 DEC

1959 A 1988

LOCATION: ST. CLAIR RIVER

LIEU:

WAVE HEIGHT (M)	N	NE	E	SE	S	SW	W	NW	IND	CALM	TOTAL FREQ.	EXCEED. FREQ.
HAUTEUR DES VAGUES (M)	N	NE	E	SE	S	SW	W	NW	IND	CALME	FREQ. TOTALE	FREQ. DE DEPASS.
0.0- 0.9	10.6	7.5	5.7	6.0	13.5	14.1	9.6	9.1	.4	9.7	86.2	100.0
1.0- 1.9	2.4	1.1	.7	.8	1.5	1.6	2.0	2.0		.0	12.2	13.8
2.0- 2.9	.3	.1	.1	.1	.1	.2	.1	.3			1.3	1.6
3.0- 3.9	.1	.0	.0		.0	.1	.0	.0			.3	.3
4.0- 4.9	.0										.0	.0
5.0- 5.9												.0
6.0- 6.9												.0
7.0- 7.9												.0
8.0- 8.9												.0
9.0- 9.9												.0
10.0-10.9												.0
11.0-11.9												.0
12.0-12.9					.0						.0	.0
13.0-13.9												.0
14.0-14.9												.0
15.0-									.0		.0	.0
TOTAL	13.4	8.8	6.6	6.9	15.1	16.0	11.7	11.4	.4	9.7	100.0	

TOTAL NUMBER OF OBSERVATIONS

7374

NOMBRE TOTAL D'OBSERVATIONS

MEAN LATITUDE OF OBSERVATIONS

42.8N

LATITUDE MOYENNE DES OBSERVATIONS

MEAN LONGITUDE OF OBSERVATIONS

82.4W

LONGITUDE MOYENNE DES OBSERVATIONS

Ice Conditions

The need for icebreaking in the St. Clair River occurs when the ice bridge that forms across the S end of Lake Huron breaks and the broken mass of ice travels down the river to the lower end where it meets the natural ice cover and forms a massive ice jam. When this occurs, ice can clog the entire 27-foot depth of the channel and cause serious flooding.

ENVIRONMENT CANADA ATMOSPHERIC ENVIRONMENT SERVICE CANADIAN CLIMATE CENTRE						ENVIRONNEMENT CANADA SERVICE DE L'ENVIRONNEMENT ATMOSPHERIQUE CENTRE CLIMATOLOGIQUE CANADIEN					
MARINE CLIMATOLOGICAL SUMMARIES PERCENTAGE FREQUENCY DISTRIBUTION OF PRECIPITATION						RESUMES CLIMATOLOGIQUES MARITIMES DISTRIBUTION DE FREQUENCE DES PRECIPITATIONS EN POURCENTAGE PERIOD: 1959 - 1988 PERIODE: 1959 A 1988					
LOCATION: ST. CLAIR RIVER LIEU:											
POTENTIAL ICING RATE DUE TO FREEZING SPRAY						FREEZING PRECI- PITATION	FOG DEPOSITING RIME	OBSERVATIONS WITH HAIL	OBSERVATIONS WITH THUNDER	NO. OF READINGS	
NONE	LIGHT	MODERATE	HEAVY	SEVERE	NO. OF READINGS						
INTENSITE EVENTUELLE DU GIVRAGE CAUSE PAR LES EMBRUNS						PRECIPITATIONS VERGLACANTES	BROUILLARD SE CONGELANT GIVRE BLANC	OBSERVATIONS EN DE GRELE	OBSERVATIONS DE TONNERRE	NBRE DE RELEVES	
NULLE	FAIBLE	MODEREE	FORTE	DANGER- EUSE	NBRE DE RELEVES						
JANUARY/JANVIER	61.5	14.3	16.5	7.7	91	.6				169	
FEBRUARY/FEVRIER	80.0	10.0	10.0		10					53	
MARCH/MARS	93.9	6.1			33					77	
APRIL/AVRIL	99.5	.5			209	.2				578	
MAY/MAI	100.0				451				.7	967	
JUNE/JUIN	100.0				602				1.6	1132	
JULY/JUILLET	100.0				558				3.5	1073	
AUGUST/AOUT	100.0				607				4.2	915	
SEPTEMBER/SEPTEMBRE	100.0				333			.1	4.3	829	
OCTOBER/OCTOBRE	100.0				279			.1	2.2	714	
NOVEMBER/NOVEMBRE	97.9	1.7	.3		292	.1			.4	874	
DECEMBER/DECEMBRE	85.5	8.7	4.0	1.7	173	.6			.3	363	

Current

The following currents are averages of water flow through the entire cross section of the river, that is from bank to bank and from the surface to the bottom during normal flow conditions. The current encountered at midstream is usually about 1.5 times the average velocity. Expect greater velocities when the difference between the lake levels is greater than normal, or the lake stages are higher. In some cases, wind may cause higher water levels and faster currents.

Currents for the following locations in the St. Clair River are for a high water flow of 230,000 cubic feet per second (cfs) and low water flow of 130,000 cfs.

- Algonac: 1.7 knots and 1.1 knots
- Port Lambton: 1.8 knots and 1.1 knots
- Marine City: 1.7 knots and 1.1 knots
- St. Clair: 1.9 knots and 1.2 knots
- Marysville: 1.7 knots and 1.1 knots
- Point Edward: 3.4 knots and 2.2 knots

The rapids section extends from about 1,000 feet (305 m) above to 200 (60 m) or 300 feet (90 m) below the Blue Water Bridge. During periods of sustained high N to NE winds on Lake Huron, velocities in the upper St. Clair River are increased.

Needs Analysis

From the information compiled from the Site Data Sheets and Threat Rating Guide, a Needs Matrix Form was completed. The most significant threats and (ratings) are as follows:

Commercial Category I

- Proximity of Hazards (1)
- Diminished Room to Manoeuvre (1)
- Darkness (1)
- Traffic Density/Mix (2)
- Sea Conditions (3)
- Channel Complexity (3)
- Reduced Visibility (3)
- Ice and Freezing Spray (3)

Commercial Category II

- Darkness (2)
- Sea Conditions (3)
- Proximity of Hazards (3)
- Channel Complexity (3)
- Diminished Room to Manoeuvre (3)
- Traffic Density/Mix (3)
- Reduced Visibility (3)

Pleasure Craft Category III

- Sea Conditions (3)

- (1) Overriding Importance
- (2) Highly Significant
- (3) Significant

Operational Analysis

Hazards

- The proximity of shorelines and of underwater hazards together with diminished room to manoeuvre and heavy traffic make navigating difficult for large commercial vessels.
- Underwater drafts of the large commercial vessels are frequently very close to the dredged depth making wind-induced water level variations a hazard.
- Current is a risk factor for the larger slower vessels especially when transiting downstream.
- The angle of turn combined with fast current is a significant threat.
- High winds, especially cross winds, can negatively affect ship handling in the narrow channel.
- Poor visibility combined with higher winds in the winter months is a concern for commercial vessels that must navigate year round.
- Darkness – while there is plenty shore lighting in some areas, often it is not sufficient or practical for use in navigating.

Channel Description

St. Clair Cutoff Channel, the main vessel route through the St. Clair River delta, extends ENE from the N end of Lake St. Clair ship channel for about 6 miles between Seaway Island and Bassett Island to its junction with South Channel at the SE end of Harsens Island. The channel is maintained by CCG and is well marked by lighted and unlighted buoys, lights, and a 064°15' lighted range on Squirrel Island.

Three diked disposal areas are on the SE side of Seaway Island. Barge landing docks are at the center and E areas. Lights mark the center and E disposal areas.

St. Clair Flats Canal extends from the N end of Lake St. Clair ship channel NE for about 1.7 miles along the SW end of Seaway Island to the junction with South Channel. The canal is marked with lighted and unlighted buoys, a light, and a 041° lighted range.

South Channel extends from the N end of St. Clair Flats Canal along the NW side of Seaway Island and bends E along the S shore of Harsens Island, MI to the junction with St. Clair Cutoff Channel at Southeast Bend. This section of South Channel is well marked with lights.

St. Clair Flats Canal and South Channel below Southeast Bend have good available depths but have not been maintained for deep-draft navigation since completion of St. Clair Cutoff Channel. The U.S. side of South Channel has extensively developed summer cottages and small-craft landings.

Periodic high water conditions submerge the earth dike along the SE edge of St. Clair Flats Canal S entrance. Small boats have struck the dike when it was submerged. A large dayboard with the words "Danger Submerged Jetty" marks the approximate point where the jetty submerges.

From the junction with St. Clair Cutoff Channel, South Channel leads NNE for about 6.5 miles to the junction with North Channel. Lighted and unlighted buoys, lights, and lighted ranges mark the channel. The minimum depth at datum is 27 feet (8.2 m).

Vessels transiting South Channel should favour the E side of the channel N of Russell Island, because the current flows strongly from the main river channel into North Channel.

Russell Island, MI, is on the W side of South Channel just below the junction with North Channel. A shallow bank extends about 0.5 mile NNE from the head of the island. A lighted buoy marks the NE side of the shoal.

A ferry landing is on the NW side of Walpole Island, Ont., opposite the upper end of Russell Island, MI. Breakwaters protect the 105-foot wharf on the N and S sides. A light marks the W end of the detached N breakwater. A ferry operates from the wharf to Algonac, MI.

From the junction with North Channel, the dredged channel of the St. Clair River extends upstream for about 7 miles to a point about 1.3 miles above Fawn Island. The channel passes W of Fawn Island. Lighted and unlighted buoys and lights mark the channel. The minimum channel depth at datum is 27 feet (8.2 m).

Port Lambton, Ont., a village on the E side of the river about 1 mile above the junction with Chenal Ecarte, has a 125-foot (38 m) Government wharf with a reported depth alongside of about 12 feet (3.6 m). A ferry operates from the wharf across the river to Roberts Landing. The ferry track is not marked on the chart. A marina is close S of the Government wharf. A Canadian customs vessel reporting station is at Port Lambton.

Roberts Landing, Michigan is on the W side of the river 3 miles above Russell Island. A ferry operates across the river to Port Lambton.

About 1.7 miles above Port Lambton, a shoal with a least depth of 15 feet (4.5 m) is in midriver along the E limit of the dredged channel. A lighted buoy off the S end of the shoal marks the limit of the dredged channel.

Fawn Island, Ont., is off the Canadian side of the river about 3 miles above Port Lambton. Shoals with depths to 1 foot extend 0.4 mile SSW and NNE from the island. An unlighted bifurcation buoy marks the S end of the shoals S of Fawn Island. A shoal with a least depth of 5 feet (1.5 m) extends along the E limit of the dredged channel from about 0.3 to 1.3 miles N of Fawn Island with a deep channel between. An unmarked channel with a least depth of about 18 feet (5.4 m) passes E of Fawn Island and the shoals. The E channel is not as straight and is not frequently used. The dredged channel W of Fawn Island is the preferred route. A ferry track is charted from the Canadian mainland to Fawn Island.

Sombra, population 420 (1981), is on the east shore 0.6 mile NNE of Fawn Island opposite Marine City, MI. Sombra is a Customs land border reporting station for passengers, general public, and commercial Highway traffic, and is a vessel reporting station for pleasure craft.

A ferry (Blue Water Ferry) serves Sombra and Marine City, Michigan, year round depending on ice conditions. It uses Sombra Public wharf, at the outer end of a causeway 230 feet (70 m) long and 20 feet (6 m) wide. There is a Canadian Coast Guard Emergency Response building with oil-spill containment equipment on the south side of the wharf and a Customs office on the north side. There are no facilities or shelter for small craft at Sombra Public wharf.

From a point 1.3 miles above Fawn Island, the channel through the St. Clair River is a natural deepwater channel 0.2 to 0.4 mile wide upstream for 6.5 miles to the lower end of St. Clair Middle Ground. Lighted buoys and lights mark the channel.

At Stokes Point, Ont., about 1.5 miles above Sombra, there is a ruined wharf. A light buoy located near the wharf replaces a light that used to mark the wharf. One mile upstream near Clay Creek is Kessel Point steering light. This aid assists downbound vessels.

Detroit Edison Co. has a power plant with two wharves on the W side of the St. Clair River about two miles above Stokes Point. Several stacks at the plant are prominent, and private lights mark the upper and lower ends of the wharf area.

Ontario Hydro Lambton Generating Station is on the E side of the river about two miles above the Detroit Edison Co. wharves. The coal wharf, 1,000 feet (305 m) long, had a depth of 30 feet (9.1 m) in 1994.

A 1.5-mile long shoal (St. Clair Middle Ground) with a least depth of 1 foot is in midriver from just below the mouth of Pine River to opposite Mooretown Ontario. Lighted buoys mark the shoal at its upper and lower ends and on the W side.

From the lower end of St. Clair Middle Ground, the dredged channel of the St. Clair River leads W of the middle ground and upstream for about 12.5 miles to just above the mouth of the Black River, then for about 1.5 miles through natural deep water to the head of the river at Lake Huron. Lighted and unlighted buoys and lights mark this section of the river.

Downbound vessels should exercise caution when negotiating the westerly turn at the upper end of St. Clair Middle Ground to avoid striking these shoals. The channel to the E of the middle ground, formerly for upbound traffic, had a minimum depth of 24 feet (7.3 m) in 1961, but there has been no maintenance of this depth since.

Courtright Ontario is a village on the E side of the river opposite St. Clair, MI. The Public wharf is 180 feet (54.9 m) long, 10 feet (3 m) wide and 6 feet (1.8 m) high, and had a depth of 11 feet (3.4 m) in 1994. Courtright is a Customs vessel reporting station for pleasure craft.

Mooretown, Ont., is on the E side of the river 1.3 miles above Courtright. The wharf at Mooretown had a depth of 7 feet (2.1 m) in 1994 but had no facilities for boaters. A pile 52 feet (15.8 m) south of the SW corner of the wharf had an elevation of 3 feet (0.9 m) in 1994.

Stag Island is off the Canadian side of the river about three miles above St. Clair Middle Ground. The main vessel channel is along the U.S. shore W of Stag Island. Shoals extend about 0.8 mile S and 0.6 mile N from the island. Lighted buoys mark the outer extent of these shoals. Stag Island Shoal Light is about mid-length of the shoals off the S end of the island.

The Canadian channel E of Stag Island, formerly the upbound channel, had a controlling depth of 21 feet in 1950, but there has been no maintenance of this depth since. A 167°15' lighted range marks the approach to Corunna, Ont., through the upper entrance to the channel and past the shoals off the mouth of Talford Creek.

Corunna, Ont., is a village on the Canadian channel E of Stag Island. A ferry operates from Corunna to the E side of Stag Island. The CCG has discontinued the range lights at Corunna although the structures remain.

Shell Canada, Ltd. operates a wharf on the E side of St. Clair River N of the mouth of Talford Creek. The wharf is 1,000 feet (305 m) long and 9 feet (2.7 m) high, with a depth of 23 feet (7 m) in 1994. Bunkering, shipping, and receiving of petroleum products are available at this site. A tank farm here makes a good landmark.

Detroit Edison Marysville Power Plant wharves are on the W side of the river about 2 miles above Stag Island.

A buoy marks the S side of a 16-foot (4.8 m) shoal on the E side of the St. Clair River opposite Detroit Edison Marysville Power Plant.

There is a municipal marina at Sarnia providing a wide range of facilities including 200 slips for transient boats.

The upper part of the St. Clair River flows S between the cities of Port Huron, Mich., and Sarnia, Ont. Vessels enter the head of the river from a dredged channel that leads through the shallow lower end of Lake Huron. A 180.3° lighted range on the E side of the head of the river marks the approach to the river through this channel. There is a Racon at the front light.

Blue Water Bridge, a fixed Highway bridge with a clearance of 150 feet (45 m), crosses the river just below the head. The bridge is prominent in approaching the river.

Currents in the upper part of the river are considerable, at times 4.4 knots or more above the Blue Water Bridge and 3.5 knots or more for 1 mile below the bridge. Upbound vessels will experience a W set between the Blue Water Bridge and Lake Huron Cut Lighted Buoys 1 and 2. Mariners should use the lowest possible safe speed in this reach to avoid damage to wharves and moored vessels.

A 207½° lighted range on the W side of the river 0.5 mile below the Blue Water Bridge marks the channel through the head of the river to just below the bridge.

Bay Point is a long narrow point that extends S along the E side of the river about 1.4 miles below the head. An unlighted buoy marks submerged ruins off the S end of the point. A lighted buoy marks an 18-foot shoal off the W side of the inner end of the point.

An alternating one-way traffic zone is between Lake Huron Cut Light Buoy 1 and St. Clair/Black River Junction Light.

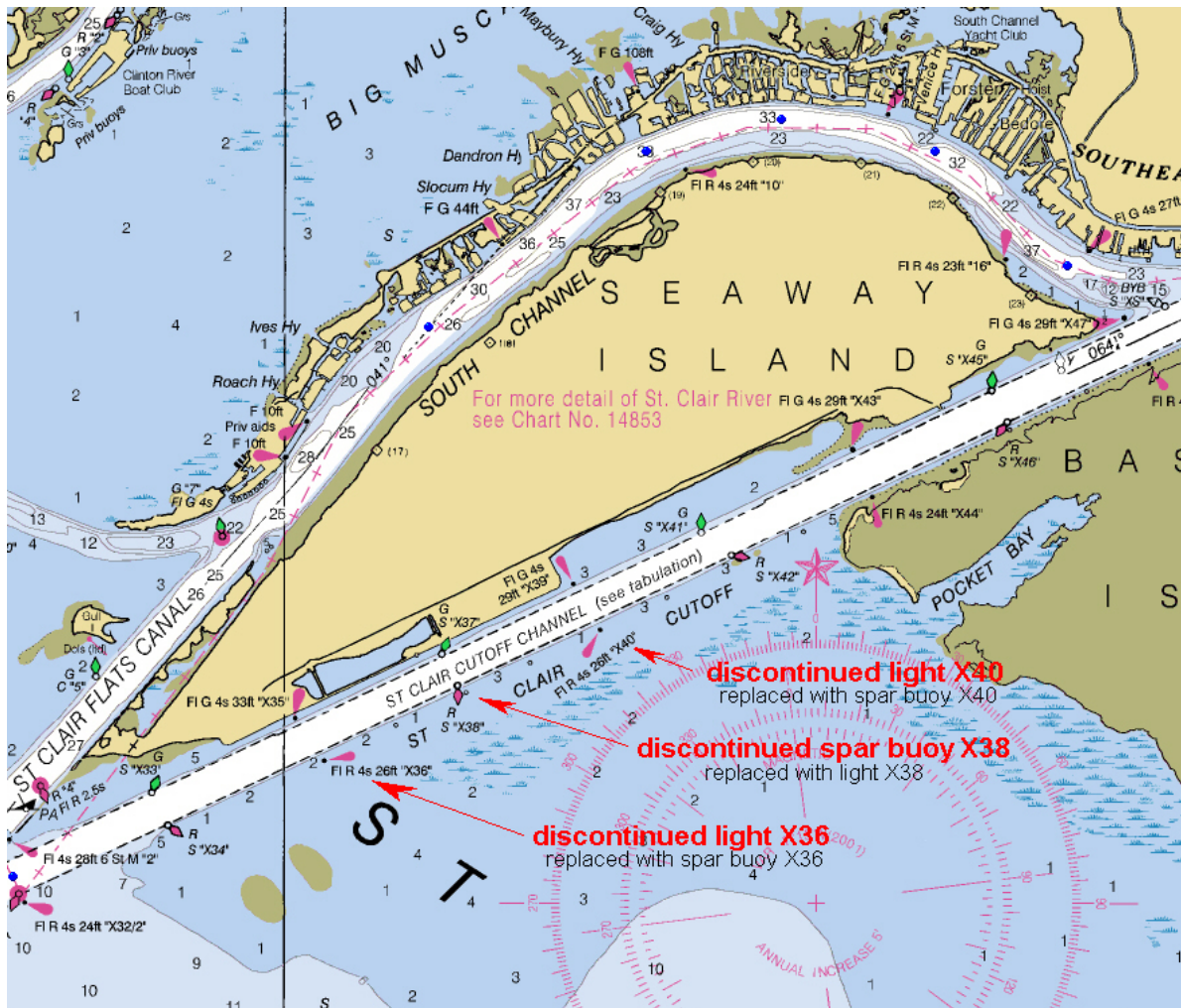
Good anchorage (clay and gravel bottom) is abreast of Sarnia below the section of the rapids near the Blue Water Bridge. There is good holding ground and some eddy near the Canadian shore below the Canadian National Railway Wharf. Vessels should anchor as close to shore as possible to leave the mid-channel clear for passing vessels.

There is mainly just the one channel for all classes of users. The exceptions are formerly upbound channels and alternate passages around the few islands in the system.

Thoughts Concerning Specific Aids to Navigation

Lights X36 and X40 and Spar Buoy X38

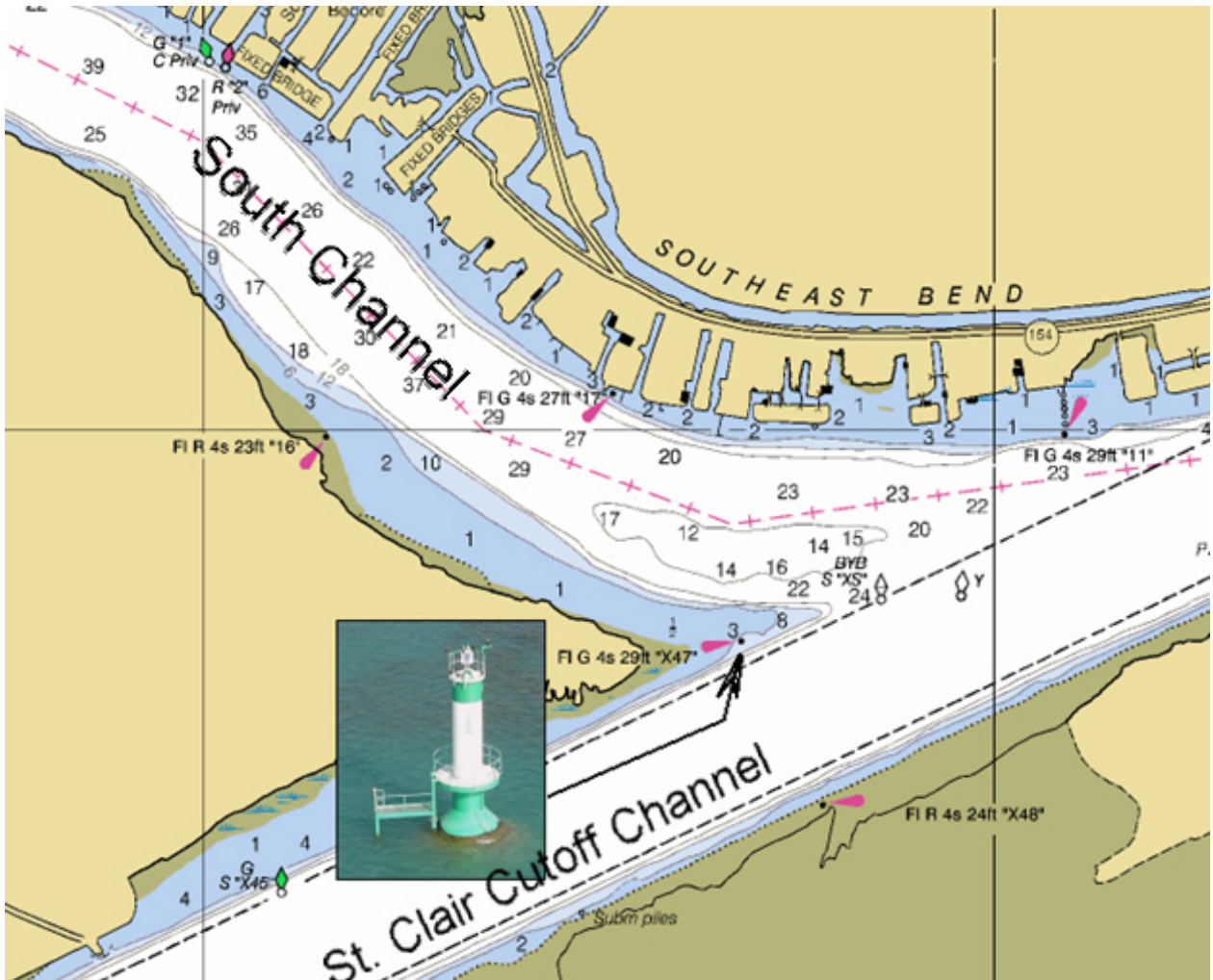
The CCG has discontinued and removed these aids from the system. In their places, the CCG has established a new light near the position of the discontinued buoy and two new unlighted spar buoys near the positions of the discontinued lights. The new light structure and spar buoys display the ID markings of the original aids they replace.



Based on daytime and nighttime visible ranges, these changes are well within acceptable tolerances. The light towers carry four-mile lights (three-mile luminous) and the structures are visible by day much further than the spar buoys that have daytime visible ranges of 1.5 miles. The spars have radar ranges of 2.5 miles. The radar ranges for the lights are better. This means there is a set of aids to navigation with a minimum daytime visible range of 1.5 miles and a minimum radar range of 2.5 miles every half mile or so. Every other set of aids exhibits one or more lights visible for three miles 75% of the time. A light tower is on the port side of the channel opposite each of the two new spar buoys.

Light X47

This light structure is located at the point of intersection between two channels - South Channel and St. Clair Cutoff Channel. Mariners determine its function by the colour of its light, which is green, and its daytime colours, which are green and white. Although CCG intends X47 for the St. Clair Cutoff Channel, vessels in the South Channel can see X47 as it appears to be in open water and it is the same distance from center channel as the nearby light, "16". Mariners in the South Channel must pass between this green light and two U.S. green lights on the other side of the channel "17" and "11".

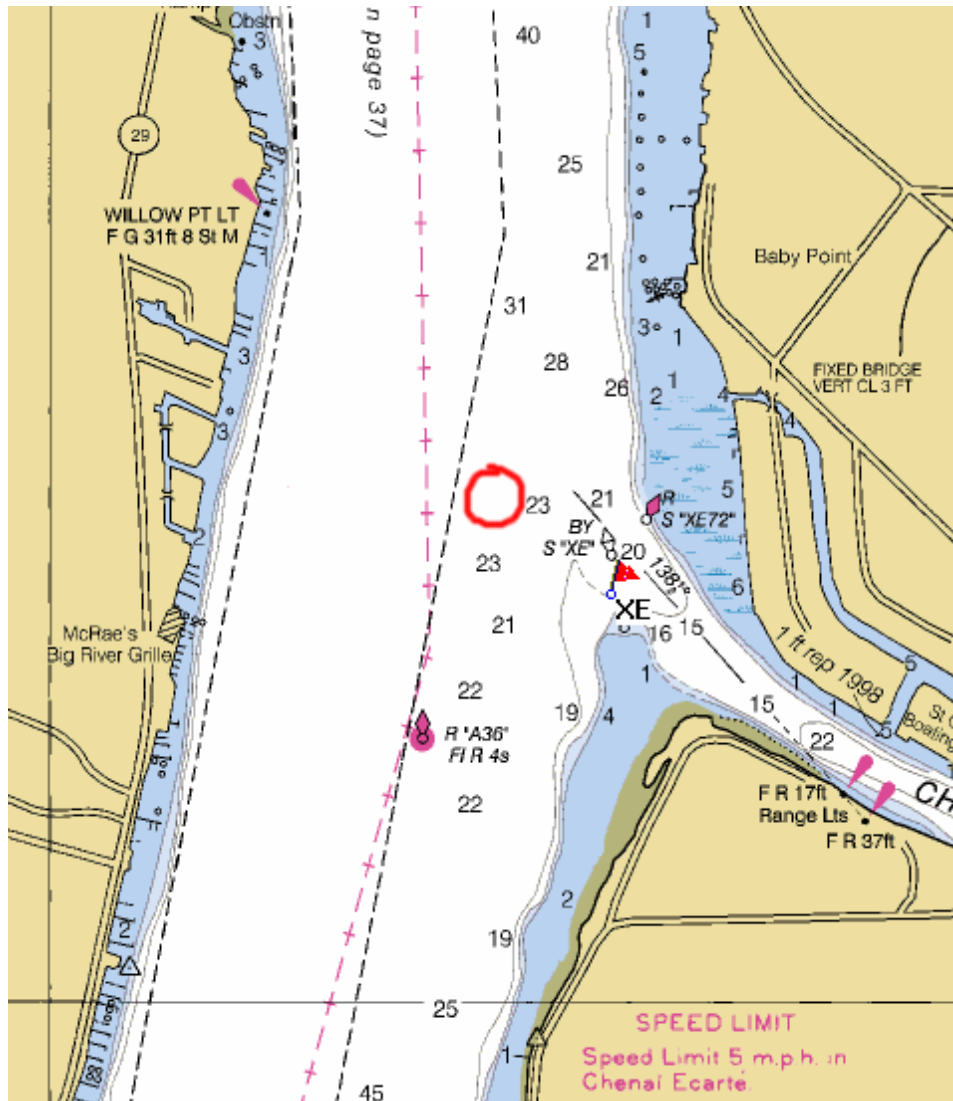


This light has been in place since around 1960 with the opening of the St. Clair Cutoff. Obviously, mariners understand how to use X47 because of their experience. However, in terms of following the standard navigation system, the port function seems inappropriate for vessels operating in the South Channel.

This aid has the potential to confuse navigators unfamiliar with the area, especially when transiting upbound and in poor visibility, as less time may be available for decision-making.

North Cardinal Spar Buoy XE

North Cardinal spar buoy XE marks the south shoal at the entrance to Chenal Ecarté. It is a cardinal to mark the junction between the main channel and the Chenal Ecarté channel. However, XE is not located at the junction. Light buoy A36 keeps vessels in the main channel away since there is not enough water for the larger vessels to pass close to XE. There is no marked shallow draft channel running alongside the main channel, as is the case near Amherstburg. If this were a new system, a port hand buoy would be adequate here. Since mariners are accustomed to the north cardinal with no known incidents or complaints, it is difficult to justify a change at this time.



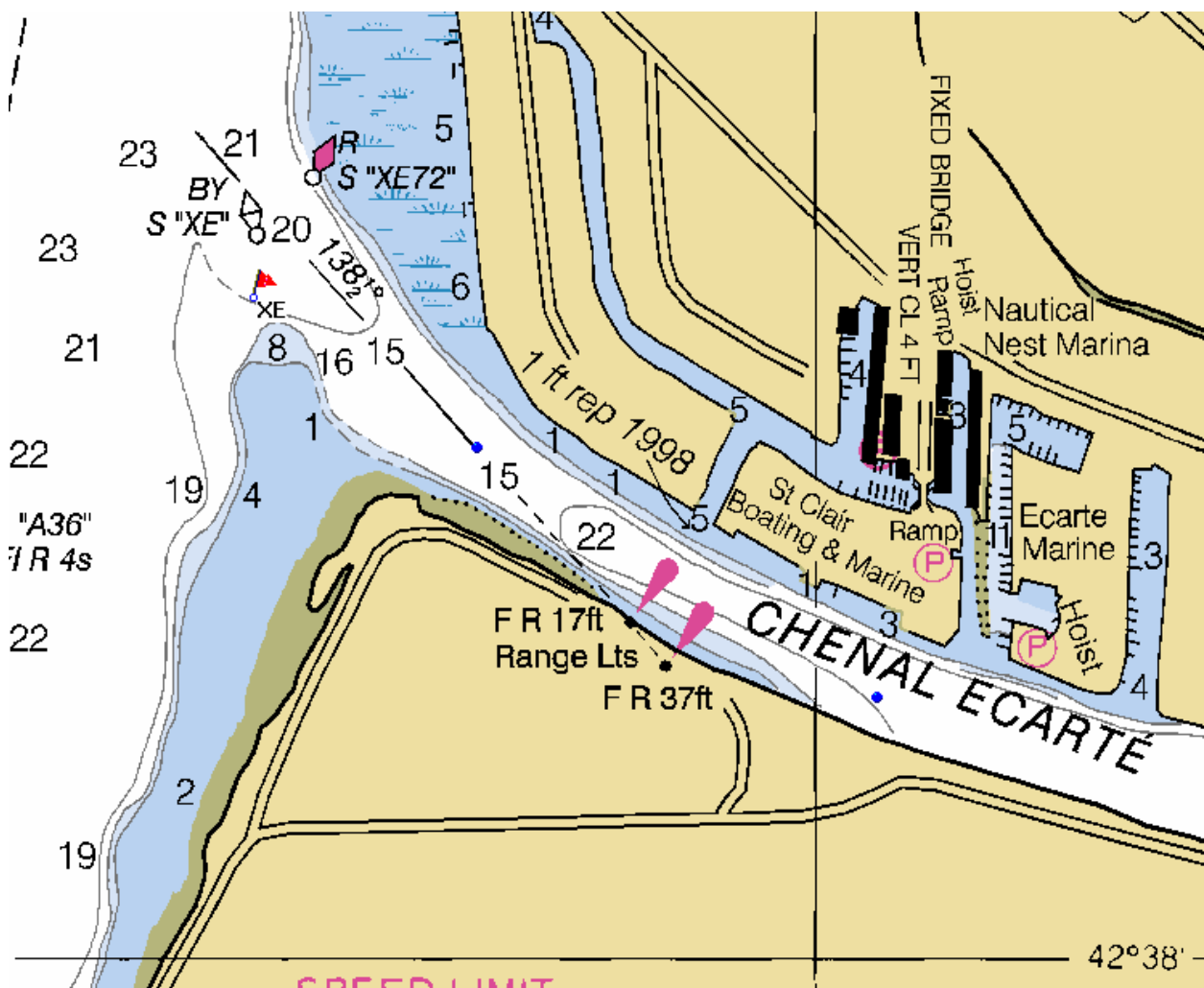
The red circle shows the approximate area where the two channels would meet and where both channels could use the same buoy.

Notice also that XE is located approximately 200 feet (60 m) south of the charted position as indicated with the red flag.

Chenal Ecarté Range

The only aids in Chenal Ecarté, other than the two spar buoys at its entrance, are the range lights. This set of range lights is useful only for a short distance. Beyond the entrance buoys, there is open water for the size of vessels using this channel. Once inside the entrance buoys, vessels can use the range lights for a distance of about 900 feet before altering course to avoid the south shore.

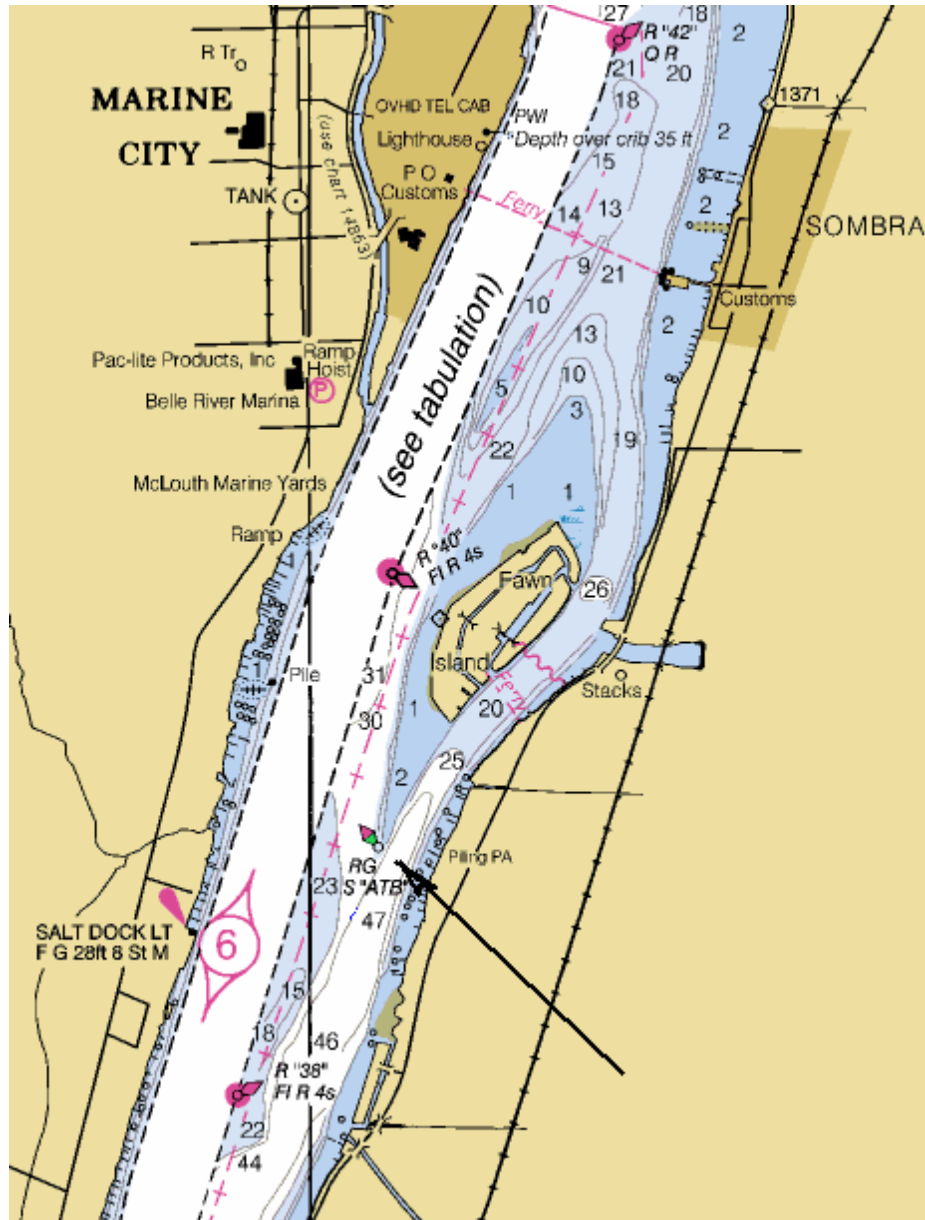
The first consideration was to divest, downsize to day ranges, or discontinue. However, the speed limit is just five knots while the following current is 1.2 knots making this potentially tricky for navigating. If the local night lighting is insufficient to lead mariners into the channel, they might find navigating here even more difficult. This review recommends keeping this set of ranges unless someone is willing to take it over.



Fawn Island Starboard Bifurcation Spar Buoy ATB

Starboard bifurcation buoy ATB marks a shoal south of Fawn Island. The only other aids in the area mark the main shipping channel passing west of the island. There is an unmarked channel for local boaters east of the island.

ATB is located outside the marked channel so it is an off-track hazard marker. Larger vessels in the main channel should not use ATB because there is a 15-foot shoal between the main channel and the buoy. There are shallow areas north of the island that are unmarked making the return to the marked channel potentially dangerous.



This bifurcation buoy ATB does two things. It tells mariners where the end of the shoal south of Fawn Island is located and it tells them they can pass on either side. Heading west toward the marked channel is a good choice. Local boaters will know where to go when taking the east passage. However, transient boaters choosing the east passage could find trouble returning to the marked channel north of the island.

Transient boaters and larger vessels should stay in the marked channel. ATB has no value to these users. It may even entice transient boaters into the east passage.

Due to the volume of local traffic, this shoal should be marked. Similarly, a buoy should mark the shoal north of the island.

Unless CCG establishes a buoy on the north shoal, ATB should not lead mariners around the east side of the island. Instead, it could be a starboard, a west cardinal, or a south cardinal. Mariners transiting east of the island then would be navigating based on local knowledge and would not be following the navigation markers.

If CCG establishes a buoy on the north shoal, then ATB could be a port, an east cardinal, a north cardinal, or continue to be a starboard bifurcation. The north shoal buoy should compliment the south shoal buoy. The two buoys should be port, east cardinals, a south and a north cardinal, or a starboard bifurcation and a cardinal to maintain consistency with other areas in the Canadian marine navigation system.

It must also be kept in mind that the USCG does not normally establish cardinal buoys so many boaters in these waters may not be familiar with how to use them.

Courtright Light

Established in 1944, Courtright light is located south of the community of Courtright on the apex of a bend in the river. At that time, there were two channels around the St. Clair Middle Ground Shoal. The upbound channel went east of the shoal and the downbound went west. There was a significant turn at Courtright for the upbound traffic but the downbound traffic turned upstream from Courtright near the shoal and by the community of St. Clair.

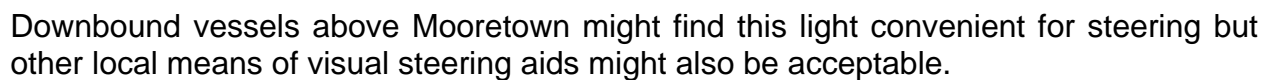
At that time, the shoreline south of Courtright was relatively undeveloped and the turn eastward into the upbound channel would have been dark except for a couple light buoys. Mariners heading upbound likely used Courtright light as a reference for beginning their turn.

Downbound vessels would not have needed this light as they had already made their turn so the channel for them was almost straight by the time they passed Courtright. Downbound mariners in this area were looking to Harts Landing light for reference.



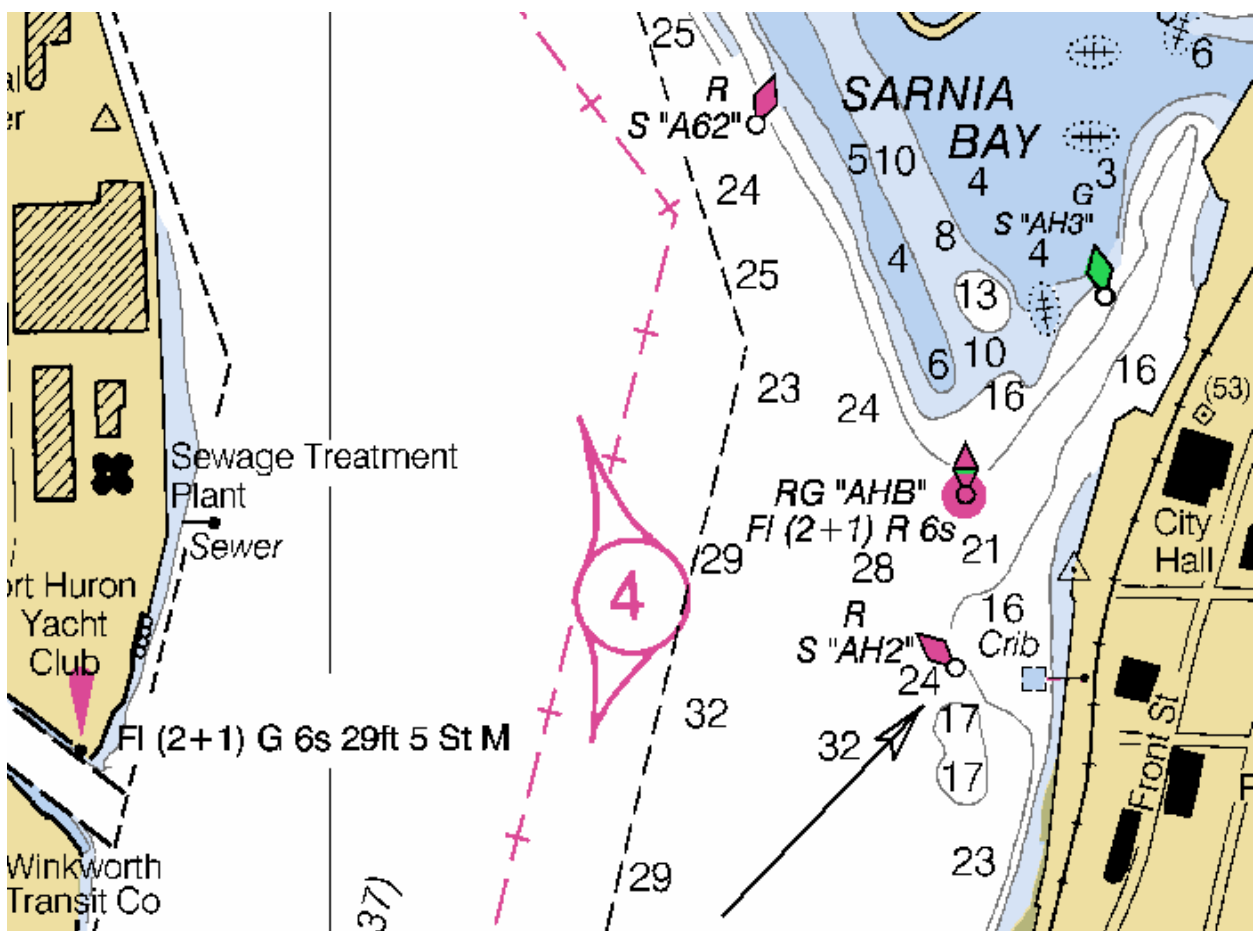
Today, the original downbound channel serves both directions. As a result, there is only a mild alteration for both upbound and downbound traffic in the area of Courtright light. Mariners may still find this light convenient when making the small alteration. The question, however, is whether it is required for safe navigation. Other structures and lights in the area may satisfactorily provide adequate references for this minor course adjustment.

Established in 1942, the light at the community of Moore (now called Mooretown) marked a wharf and the edge of the upbound channel. In the middle of the river across from this light was the junction buoy separating the upbound and downbound traffic above the St. Clair Middle Ground Shoal.



Sarnia Starboard Spar Buoy AH2

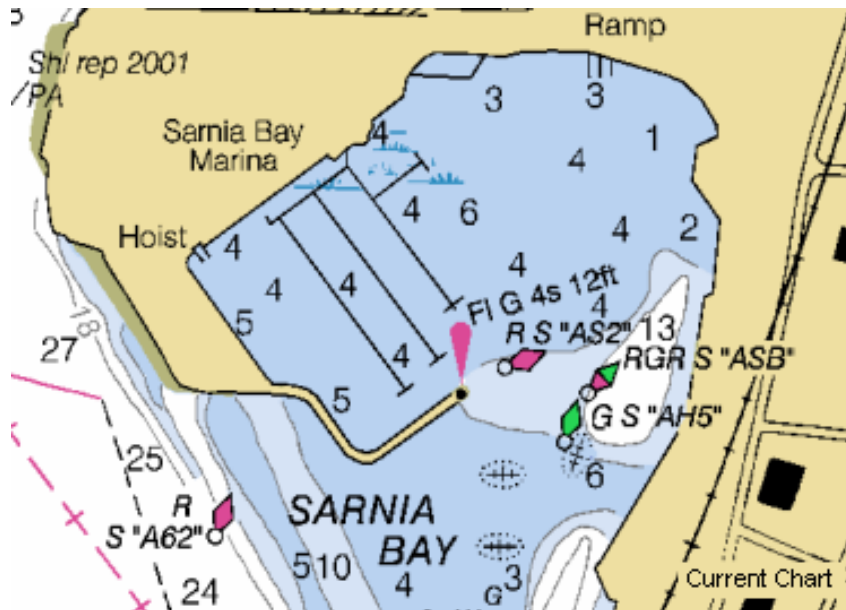
Spar buoy AH2 marks an 18-foot depth contour line near a crib at Sarnia. When transiting upstream, the channel divides into two at starboard bifurcation light buoy AHB. Channel A continues north by northwest up the main river and the secondary channel AH takes mariners into Sarnia Bay Marina. AH2 is marked incorrectly because the AH channel starts after the bifurcation buoy AHB upstream from AH2. There is a crib 190 feet east of the spar but it is close to shore (120 feet) and has more than six feet of water over it. Vessels drawing more than six feet cannot enter the marina so they should not be transiting this close to the shoreline. Vessels having depths of more than 18 feet should stay in the main channel.



Spar buoy AH2 marks an off-track hazard for vessels in the main channel and the water depth poses no threat to vessels with shallow enough drafts to enter Sarnia Bay. If CCG feels the crib needs marking, a caution buoy is another possibility.

Port Bifurcation Spar Buoy ASB

This port bifurcation buoy tells boaters that the main channel AH continues in a northerly direction where there are no aids to navigation and the water is shallower than in the secondary channel marked AS. There is a public boat ramp north of ASB as a destination for smaller vessels. From the bifurcation buoy, the secondary AS channel turns west toward Sarnia Bay Marina light at the end of the breakwater. On the west side of the bay, there are more berths and a hoist for larger vessels.



Note that in 1985, when the marina began operations, the system was almost identical except the starboard bifurcation has the main channel turning west and a secondary channel heading north for the ramp.

The channel changed in 1985 in response to the new recreational traffic. There were two distinct destinations leading from the entrance to the marina so the system designers established a starboard bifurcation buoy to direct traffic. According to the system, smaller craft headed north in an unmarked secondary channel for the public ramp and larger vessels headed west for the marina following the channel markers.

The short channel leading to the marina consisted of a port light on the end of the breakwater and a starboard spar buoy marked AS2. This "AS2" marking indicated the marina-bound channel was not a continuation of the AH channel in contradiction to the information provided by the starboard bifurcation buoy.

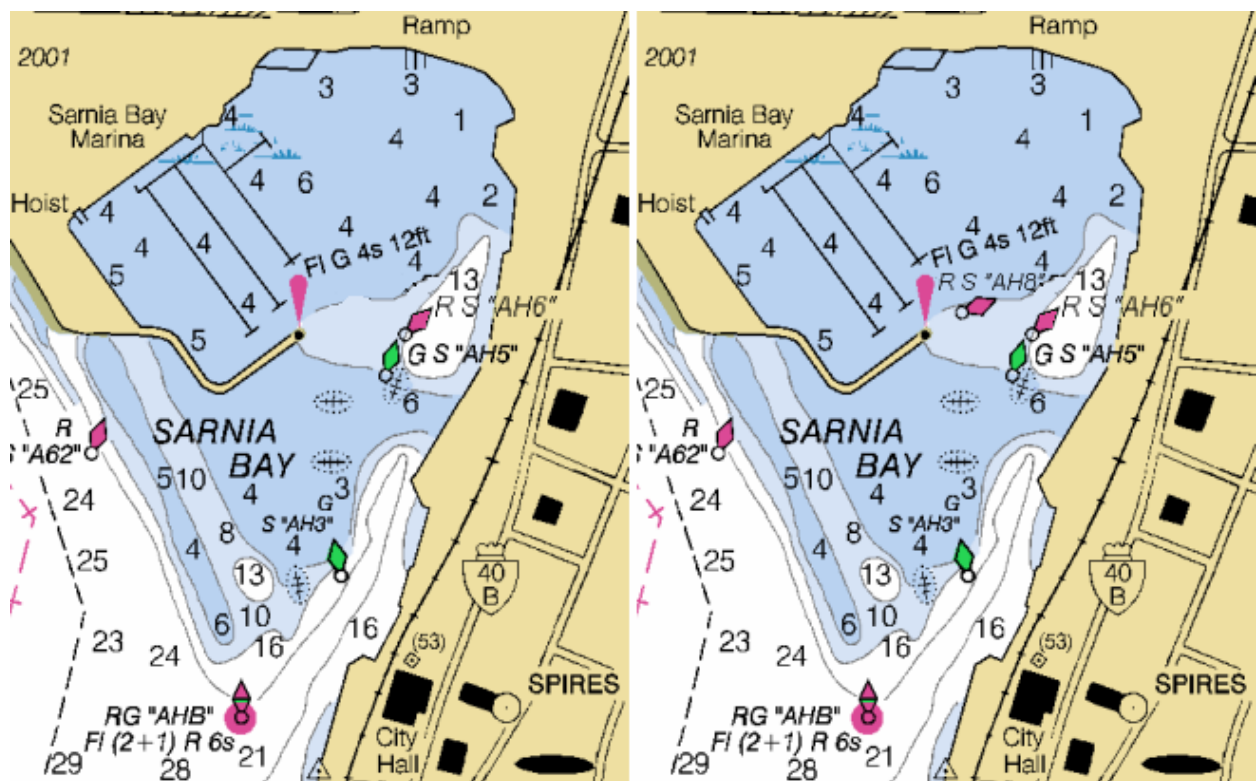
Sometime after 1985, a port bifurcation buoy replaced the starboard bifurcation buoy. Although the buoy markings are now consistent, the indicated main channel now leads to the public boat ramp servicing the smaller vessels. Larger vessels and transient boaters normally should choose the secondary channel and turn west.

A bifurcation buoy at the ASB position increases the complexity of the channel at a point where transient mariners are looking around trying to figure out where they want to go. There are 100 seasonal boat slips at the marina but there are 200 berths for transient boaters.

The ideal channel into Sarnia Bay would consist of just AHB, AH3, AH5, and the port breakwater light. Mariners with larger vessels would follow the port buoys around to the light and into the marina. Smaller craft could do the same or exit the channel anywhere after passing AH5 to head for the boat ramp.

Two compromises may be required. The first might be to establish a starboard spar buoy marked AH6 at the position of ASB and forming a gate with buoy AH5. The larger boats use the current bifurcation buoy as starboard now and smaller boats can go on either side. The starboard buoy would serve as extra notice for the turn into the marina for the larger boats.

The second compromise might be to keep starboard spar buoy AS2. There is a possibility that buoy AS2 prevents larger vessels from wandering into shallow water to the east from the light. If this is the case, it should remain and be renumbered AH8. This would be in addition to replacing the bifurcation buoy ASB with starboard spar buoy AH6. Without AH6, mariners could mistakenly pass between AH5 and AH8. With this compromise, CCG could also replace ASB with a starboard bifurcation buoy.



The above charts are proposals only.

Review Options for Aids on the St. Clair River

This system has been working well for a number of years and a recent review already resulted in some changes. The review considers the options listed below as desirable in order to offer a consistent standard system of marine aids to navigation. However, experience shows that the changes listed below are not significant for marine safety. Furthermore, the review does not weigh the costs of implementing these options against perceived benefits.

1. Port Light X47

- Change day markings to all white or red and green sectors.
- Change green light to sector light (red visible from shore at heading 110 degrees true through S. to 185 and green visible from 185 through W. and N. to shore at 065)

2. Fawn Island Starboard Bifurcation Spar Buoy ATB

- Replace ATB with a west cardinal spar buoy.
- Maintain ATB as a starboard bifurcation... and
- Establish an east cardinal on the north shoal... or

3. Courtright Light

- After consultation with commercial mariners, CCG should discontinue or divest.

4. Mooretown Light

- After consultation with commercial mariners, CCG should discontinue or divest.

5. Starboard Spar Buoy AH2

- Discontinue AH2, establish a caution buoy in its place, and divest... or
- Discontinue AH2... or
- Renumber AH2 to A60/2.

6. Sarnia Bay

- Replace ASB with starboard spar buoy AH6... and
- Renumber starboard spar buoy AS2 to AH8... and
- If possible, divest AHB, AH3, AH5, AH6, AH8, and Sarnia Breakwater Light... or
- Replace ASB with starboard bifurcation spar buoy ASB... and
- Renumber AS2 to AH8... and
- If possible, divest AHB, AH3, AH5, ASB, AH8, and Sarnia Breakwater Light.



Fisheries and Oceans
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Canada



Canada

November 2004

AIDS TO NAVIGATION - SITE DATA SHEET

Prescott / Central and Arctic

US14848 / US14853

St. Clair River

District / Region

Chart(s)

Site Description

1	NAVIGATION SEASON	Certified Commercial	I	Year Round			
		Uncertified Commercial	II	May - October			
		Pleasure Craft	III	May - October			
2	MAXIMUM SHIP SIZE			Gross	Length	Beam	Draught
		Certified Commercial	I	78,850	1014.5 ft	105 ft	26 ft
		Uncertified Commercial	II				
		Pleasure Craft	III				
3	VOLUME OF TRAFFIC			Number of Users		Number of Transits	
		Certified Commercial	I	estimate 300		20,344	
		Uncertified Commercial	II	estimate 50		2,716	
		Pleasure Craft	III				
4	NIGHT USAGE % USERS OPERATING IN DARK	Certified Commercial	I	100%			
		Uncertified Commercial	II				
		Pleasure Craft	III				

MONTHS			OUTER APPROACHES OPEN WATER	INNER APPROACHES CONFINED WATER
5	VISIBILITY % TIME VISIBILITY EQUAL OR GREATER THAN (nautical miles) (worst month of season)	January / August	0.5	97.1 / 98.3
			1.1	92.7 / 96.4
			2.2	85.5 / 92.0
			5.4	73.0 / 79.9
6	FREEZING SPRAY % OCCURRENCE (worst month of navigation season)	January	moderate	16.5%
			heavy	7.7%
			severe	
7	WIND SPEED % TIME WIND SPEED EXCEEDS (nautical miles) (navigation season)	Year / May - Oct	10	39.3 / 29.9
			20	2.3 / 1.0
			25	0.5 / 0.1
			30	0.2 / 0.0
			35	0.0 / 0.0
			40	
8	WAVE HEIGHT % TIME WAVE HEIGHT EXCEEDS (metres) (navigation season)	Year	1	13.8%
			2	1.6%
			3	0.3%
			4	
			5	
			6	
9	TIDE RANGE / FLUCTUATING WATER DEPTH (feet)			4
10	MAXIMUM CURRENT (knots)	along track		3.9
		across track		
11	CHANNEL SILTATION (yes/no)			no
12	DISTINCTIVE SHORELINE FEATURES (yes/no)	visual		yes
		radar		yes

St. Clair River Inventory Summary

October 28, 2004

Count Category Description

1 FIXED AIDS

1	1.1	Major Lights (≥ 10 mile nominal range)
21	1.2	Minor Lights (< 10 mile nominal range)
6	1.3	Ranges (sets) : Lighted
		Ranges (sets) : Unlighted
	1.4	Day Beacons
	1.5	Radar Reflector Beacons
	1.6	Major Fog Signals (≥ 1 mile nominal range)
	1.7	Minor Fog Signals (< 1 mile nominal range)
	1.8	Racons on Fixed Structures
17	1.9	Others (Specify) <u>US and private</u>
		Others (Specify) _____

45 Fixed

2 FLOATING AIDS

Lighted Buoys

	2.1	Large Whistle (2.9m diameter; 6000kg)
	2.2	Large Bell or Fog Signal (2.9m diameter; 4400kg)
18	2.3	Medium (1.4m to 1.8m diameter; 1900-3000kg)
1	2.4	Small (< 1.4 m diameter; 1000kg)

Unlighted buoys

18	2.5	Large (ice spars; > 600 kg)
	2.6	Medium (175-600kg)
4	2.7	Small (< 175 kg)
	2.8	Racons on Buoys
17	2.9	Others (Specify) <u>US and private</u>
		Others (Specify) _____

58 Floating

103 ALL AIDS



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MARINE AIDS

SITE INVENTORY AND TECHNICAL DATA

Date:	October 28, 2004
District:	Central & Arctic, Prescott
Chart:	US14853, US14852
Site:	St. Clair River

Description			Day-light Visual Range	Radar Range	Light signal								Sound Signal		General History		
Aid No.	General Category	Particulars			Lantern Type and Size	Rotation Flash Duration	Lens Type and Colour	Bulb				Nominal Range	Luminous Range	Horn	Nominal Range	Year Est.	Circumstances Etc.
	(See summary)	(Name Type Size Seasonality)						Nautical Miles	Type	Voltage	Amps Watts	Candelas	N. Miles	db	Hz		
741	1.1	Walpole Island, starboard, Shore Light, 04b, Year Round, CCG	3.8	2	Prescott DLD 300mm	F	Red	Metal Halide White		175 W	2,000	11	7			1953	A-Light, C-Radar Target, 1-Visual Marker on Hazard, 2-Lighted Marker on Hazard, 11-Visual Marker on Turn, 12-Lighted Marker on Turn, 15-Radar Target on Hazard Turn or Boundary
7014 X38	1.2	Pier X38, starboard, Pier Light, 04b, Year Round, CCG	2	2	Tideland 155mm	Fl 4s	Red	Incandescent White		0.77 A	34	4	3			2004	A-Light, C-Radar Target, 1-Visual Marker on Hazard, 2-Lighted Marker on Hazard, 15-Radar Target on Hazard Turn or Boundary, NOTE: buoy X38 permanently discontinued and replaced with fixed structure and light
721 X32/2	1.2	Pier X32/2, starboard, Pier Light, 04b, Year Round, CCG	2	2	Tideland 155mm	Fl 4s	Red	Incandescent White		0.77 A	34	4	3			1982	A-Light, C-Radar Target, 11-Visual Marker on Turn, 12-Lighted Marker on Turn, 15-Radar Target on Hazard Turn or Boundary
723 X35	1.2	Pier X35, port, Pier Light, 04b, Year Round, CCG	2	2	Tideland 155mm	Fl 4s	Green	Incandescent White		0.77 A	34	4	3			1982	A-Light, C-Radar Target, 1-Visual Marker on Hazard, 2-Lighted Marker on Hazard, 15-Radar Target on Hazard Turn or Boundary
725 X39	1.2	Pier X39, port, Pier Light, 04b, Year Round, CCG	2	2	Tideland ML-155 155mm	Fl 4s	Green	Incandescent White		0.77 A	34	4	3			1982	A-Light, C-Radar Target, 1-Visual Marker on Hazard, 2-Lighted Marker on Hazard, 15-Radar Target on Hazard Turn or Boundary
727 X43	1.2	Pier X43, port, Pier Light, 04b, Year Round, CCG	2	2	Tideland 155mm	Fl 4s	Green	Incandescent White		0.77 A	34	4	3			1982	A-Light, C-Radar Target, 1-Visual Marker on Hazard, 2-Lighted Marker on Hazard, 15-Radar Target on Hazard Turn or Boundary
728 X44	1.2	Pier X44, starboard, Pier Light, 04b, Year Round, CCG	2	2	Tideland 155mm	Fl 4s	Red	Incandescent White		0.77 A	34	4	3			1982	A-Light, C-Radar Target, 1-Visual Marker on Hazard, 2-Lighted Marker on Hazard, 15-Radar Target on Hazard Turn or Boundary
729 X47	1.2	Pier X47, port, Pier Light, 04b, Year Round, CCG	2	2	Tideland 155mm	Fl 4s	Green	Incandescent White		0.77 A	34	4	3			1982	A-Light, C-Radar Target, 1-Visual Marker on Hazard, 2-Lighted Marker on Hazard, 11-Visual Marker on Turn, 12-Lighted Marker on Turn, 15-Radar Target on Hazard Turn or Boundary, 21-Alternative Route
730 X48	1.2	Pier X48, starboard, Pier Light, 04b, Year Round, CCG	2	2	Tideland 155mm	Fl 4s	Red	Incandescent White		0.77 A	34	4	3			1982	A-Light, C-Radar Target, 1-Visual Marker on Hazard, 2-Lighted Marker on Hazard, 15-Radar Target on Hazard Turn or Boundary
734 10	1.2	Maybury Highway 10, starboard, Pier Light, 04b, Year Round, CCG	1.5	1.5	Tideland 155mm	Fl 4s	Red	Incandescent White		0.77 A	34	4	3			1928	A-Light, C-Radar Target, 1-Visual Marker on Hazard, 2-Lighted Marker on Hazard, 11-Visual Marker on Turn, 12-Lighted Marker on Turn, 15-Radar Target on Hazard Turn or Boundary
736 16	1.2	Southeast Bend 16, starboard, Pier Light, 04b, Year Round, CCG	1.2	1.2	Tideland 155mm	Fl 4s	Red	Incandescent White		0.77 A	34	4	3			1913	A-Light, C-Radar Target, 1-Visual Marker on Hazard, 2-Lighted Marker on Hazard, 15-Radar Target on Hazard Turn or Boundary
737 A20	1.2	South Channel A20, starboard, Pier Light, 04b, Year Round, CCG	3	2	Tideland 155mm	Q 1s	Red	Incandescent White		0.77 A	26	4	3			1913	A-Light, C-Radar Target, 1-Visual Marker on Hazard, 2-Lighted Marker on Hazard, 11-Visual Marker on Turn, 12-Lighted Marker on Turn, 15-Radar Target on Hazard Turn or Boundary

MARINE AIDS
SITE INVENTORY AND TECHNICAL DATA

Date:	October 28, 2004
District:	Central & Arctic, Prescott
Chart:	US14853, US14852
Site:	St. Clair River

Description			Day-light Visual Range	Radar Range	Light signal									Sound Signal			General History	
Aid No.	General Category	Particulars			Lantern Type and Size	Rotation Flash Duration	Lens Type and Colour	Bulb				Nominal Range	Luminous Range	Horn	Nominal Range	Year Est	Circumstances Etc.	
	(See summary)	(Name Type Size Seasonality)						Nautical Miles	Type	Volt-age	Amps Watts							Candelas
739 A26	1.2	Light A26, starboard, Pier Light, 04b, Year Round, CCG	2.8	2	Tideland 155mm	Q 1s	Red	Incandescent White		0.77 A	26	4	3				1988	A-Light, C-Radar Target, 1-Visual Marker on Hazard, 2-Lighted Marker on Hazard, 11-Visual Marker on Turn, 12-Lighted Marker on Turn, 15-Radar Target on Hazard Turn or Boundary
742 A32	1.2	Walpole Island, Lower A32, starboard, Pier Light, 04b, Year Round, CCG	6	2	Tideland ML-300 300mm	Iso 4s	Red	Quartz Halogen White		20 W	962	9	5				1920	A-Light, C-Radar Target, 1-Visual Marker on Hazard, 2-Lighted Marker on Hazard, 15-Radar Target on Hazard Turn or Boundary
743	1.2	Walpole Island Ferry Breakwater, starboard, Pier Light, 04b, Year Round, CCG	1		Tideland 155mm	Fl 4s	Red	Incandescent White		0.77 A	34	4	3				1956	A-Light, 1-Visual Marker on Hazard, 2-Lighted Marker on Hazard, 3-Visual Marker for Position, 4-Lighted Marker for Position
744 A34	1.2	Walpole Island Upper A34, starboard, Pier Light, 04b, Year Round, CCG	4.5	3	Tideland 155mm	Fl 4s	Red	Incandescent White		0.77 A	34	4	3				1920	A-Light, C-Radar Target, 13-Visual Marker on Off-Track Hazard, 14-Lighted Marker on Off-Track Hazard
750	1.2	Kessel Point, information, Shore Light, 04b, Year Round, CCG	3		Tideland ML-300 300mm	F	Yellow	Incandescent White		0.55 A	169	6	4.1				1953	A-Light, used as a steering light
752	1.2	Bowens Creek Light, steering, Shore Light, 04b, Year Round, CCG	3		Tideland ML-300 300mm	F	Yellow	Incandescent White		0.55 A	169	6	4.1				1963	A-Light, used as a steering light
753	1.2	Courtright, sector light, Pier Light, 04b, Year Round, CCG	2	1	Tideland 300mm	F	Yellow	Incandescent White		2.03 A	683	9	6				1944	A-Light, 1-Visual Marker on Hazard, 2-Lighted Marker on Hazard, 11-Visual Marker on Turn, 12-Lighted Marker on Turn, 15-Radar Target on Hazard Turn or Boundary
756	1.2	Mooretown, secondary landfall, Wharf Light, 04b, Year Round, CCG	3.5	3.5	Tideland 300mm	Fl 4s	Yellow	Incandescent White		2.03 A	410	8	5.2				1942	A-Light, C-Radar Target, 13-Visual Marker on Off-Track Hazard, 14-Lighted Marker on Off-Track Hazard
759	1.2	Stag Island Shoal, hazard / warning, Shoal light, 04b, Year Round, CCG	2	2	Tideland 155mm	Fl 4s	White	Incandescent White		0.77 A	119	6	4				1900	A-Light, C-Radar Target, 1-Visual Marker on Hazard, 2-Lighted Marker on Hazard, 15-Radar Target on Hazard Turn or Boundary, used as a steering light
765.5	1.2	Sarnia Breakwater, port, Pier Light, 04b, Seasonal, CCG	2	2	Tideland 155mm	Fl 4s	Green	Incandescent White		0.77 A	34	4	3				1982	A-Light, 1-Visual Marker on Hazard, 2-Lighted Marker on Hazard, 22-Port of Refuge Marker
732	1.3	Squirrel Island range front, front range, Front Range, 08b, Year Round, CCG	4	2	Wallace & Tiernan FA 240	Iso 2s	Yellow	Incandescent White		0.55 A	13,232	14	8.5				1962	A-Light, 5-Visual Marker for Lateral Motion, 6-Lighted Marker for Lateral Motion
733	1.3	Squirrel Island range rear, rear range, Rear Range, 08b, Year Round, CCG	4		Wallace & Tiernan FA 240	F	Yellow	Incandescent White		0.77 A	24,000	16	10				1962	A-Light, 5-Visual Marker for Lateral Motion, 6-Lighted Marker for Lateral Motion
746	1.3	Chenal Ecarte range front, front range, Front Range, 08b, Year Round, CCG	0.75	0.75	Wallace & Tiernan FA 240	F	Red	Incandescent White		0.55 A	5,000	13	8				1909	A-Light, C-Radar Target, 1-Visual Marker on Hazard, 2-Lighted Marker on Hazard, 5-Visual Marker for Lateral Motion, 6-Lighted Marker for Lateral Motion, 15-Radar Target on Hazard Turn or Boundary



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MARINE AIDS

SITE INVENTORY AND TECHNICAL DATA

Date:	October 28, 2004
District:	Central & Arctic, Prescott
Chart:	US14853, US14852
Site:	St. Clair River

Description			Day-light Visual Range	Radar Range	Light signal										Sound Signal		General History	
Aid No.	General Category	Particulars			Lantern Type and Size	Rotation Flash Duration	Lens Type and Colour	Bulb				Nominal Range	Luminous Range	Horn	Nominal Range	Year Est.	Circumstances Etc.	
	(See summary)	(Name Type Size Seasonality)						Nautical Miles	Type	Voltage	Amps Watts							Candelas
747	1.3	Chenal Ecarte range rear, rear range, Rear Range, 08b, Year Round, CCG	0.75	0.75	Wallace & Tiernan FA 240	F	Red	Incandescent White		0.55 A	5,000	13	8			1909	A-Light, 5-Visual Marker for Lateral Motion, 6-Lighted Marker for Lateral Motion	
768	1.3	Point Edward range front, front range, Front Range, 08b, Year Round, CCG	4.5		Wallace & Tiernan FA 240	F	Red	Incandescent White		2.03 A	26,400	16	10			1903	A-Light, 5-Visual Marker for Lateral Motion, 6-Lighted Marker for Lateral Motion, 17-Radar Signal for Position or Turn	
769	1.3	Point Edward range rear, rear range, Rear Range, 08b, Year Round, CCG	4.5		Wallace & Tiernan FA 240	F	Red	Incandescent White		2.03 A	26,400	16	10			1903	A-Light, 5-Visual Marker for Lateral Motion, 6-Lighted Marker for Lateral Motion	
709.3	1.9	St. Clair Flats Canal range front (U.S.), front range, Front Range, 08c, Year Round, U.S.	4			F	Green	White									A-Light, 1-Visual Marker on Hazard, 2-Lighted Marker on Hazard, 5-Visual Marker for Lateral Motion, 6-Lighted Marker for Lateral Motion	
709.4	1.9	St. Clair Flats Canal range rear (U.S.), rear range, Rear Range, 08c, Year Round, U.S.	4			F	Green	White									A-Light, 5-Visual Marker for Lateral Motion, 6-Lighted Marker for Lateral Motion	
730.5 11	1.9	Harsens Island 11 (U.S.), port, Pier Light, 04b, Year Round, U.S.	0.5			Fl 4s	Green	White									A-Light, C-Radar Target, 1-Visual Marker on Hazard, 2-Lighted Marker on Hazard, 11-Visual Marker on Turn, 12-Lighted Marker on Turn, 15-Radar Target on Hazard Turn or Boundary	
734.5 13	1.9	Light 13 (U.S.), port, Pier Light, 04b, Year Round, U.S.	1			F	Green	White				6					A-Light, C-Radar Target, 1-Visual Marker on Hazard, 2-Lighted Marker on Hazard, 11-Visual Marker on Turn, 12-Lighted Marker on Turn, 15-Radar Target on Hazard Turn or Boundary	
736.5 17	1.9	Light 17 (U.S.), port, Pier Light, 04b, Year Round, U.S.	1			Fl 4s	Green	White				4					A-Light, C-Radar Target, 1-Visual Marker on Hazard, 2-Lighted Marker on Hazard, 11-Visual Marker on Turn, 12-Lighted Marker on Turn, 15-Radar Target on Hazard Turn or Boundary	
737.6	1.9	Harsens Island range front (U.S.), front range, Front Range, 08b, Year Round, U.S.	1.5	1.5		F	Green	White									A-Light, 1-Visual Marker on Hazard, 2-Lighted Marker on Hazard, 5-Visual Marker for Lateral Motion, 6-Lighted Marker for Lateral Motion, 15-Radar Target on Hazard Turn or Boundary	
737.7	1.9	Harsens Island range rear (U.S.), rear range, Rear Range, 08b, Year Round, U.S.	1.5			F	Green	White									A-Light, 5-Visual Marker for Lateral Motion, 6-Lighted Marker for Lateral Motion	
737.8 23	1.9	Grande Pointe 23 (U.S.), port, Dolphin, 04b, Year Round, U.S.	2.5			F	Green	White				5					A-Light, C-Radar Target, 1-Visual Marker on Hazard, 2-Lighted Marker on Hazard, 15-Radar Target on Hazard Turn or Boundary	
740.2	1.9	Russell Island (U.S.), sector light, Sector Light, 04a, Year Round, U.S.	4			F	White	White				10					A-Light, 1-Visual Marker on Hazard, 2-Lighted Marker on Hazard, 11-Visual Marker on Turn, 12-Lighted Marker on Turn	
742.5 33	1.9	Russell Island 33 (U.S.), port, Pier Light, 04b, Year Round, U.S.	3			F	Green	White				5					A-Light, 1-Visual Marker on Hazard, 2-Lighted Marker on Hazard	



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MARINE AIDS

SITE INVENTORY AND TECHNICAL DATA

Date:	October 28, 2004
District:	Central & Arctic, Prescott
Chart:	US14853, US14852
Site:	St. Clair River

Description			Day-light Visual Range	Radar Range	Light signal								Sound Signal		General History			
Aid No.	General Category	Particulars			Lantern Type and Size	Rotation Flash Duration	Lens Type and Colour	Bulb				Nominal Range	Luminous Range	Horn	Nominal Range	Year Est.	Circumstances Etc.	
	(See summary)	(Name Type Size Seasonality)						Nautical Miles	Type	Volt- age	Amps Watts	Candelas	N. Miles	db	Hz			N. Miles
747.2	1.9	Willow Point (U.S.), port, Pier Light, 04b, Year Round, U.S.	4			F	Green	White				8					A-Light, 1-Visual Marker on Hazard, 2-Lighted Marker on Hazard, 11-Visual Marker on Turn, 12-Lighted Marker on Turn	
748	1.9	Marine City Salt Dock (U.S.), port, Pier Light, 04b, Year Round, U.S.	5			F	Green	White				8					A-Light, 1-Visual Marker on Hazard, 2-Lighted Marker on Hazard, 15-Radar Target on Hazard Turn or Boundary	
752.2	1.9	Harts Landing (U.S.), port, Dolphin, 04b, Year Round, U.S.	3			F	Green	White				8					A-Light, 1-Visual Marker on Hazard, 2-Lighted Marker on Hazard	
760.5	1.9	Stag Island Middle (U.S.), port, Shore Light, 04b, Year Round, U.S.	4.5			Oc 4s	Green	White				8					A-Light, C-Radar Target, 1-Visual Marker on Hazard, 2-Lighted Marker on Hazard, 11-Visual Marker on Turn, 12-Lighted Marker on Turn, 15-Radar Target on Hazard Turn or Boundary, used as a steering light	
764.5	1.9	Stag Island Upper (U.S.), port, Pier Light, 04b, Year Round, U.S.	3			Fl 2.5s	Green	White				7					A-Light, 1-Visual Marker on Hazard, 2-Lighted Marker on Hazard	
766.4	1.9	Fort Gratiot range front (U.S.), front range, Front Range, 08b, Year Round, U.S.	1.25			F	White	White									A-Light, 5-Visual Marker for Lateral Motion, 6-Lighted Marker for Lateral Motion	
766.5	1.9	Fort Gratiot range rear (U.S.), rear range, Rear Range, 08b, Year Round, U.S.	1.25			F	White	White									A-Light, 5-Visual Marker for Lateral Motion, 6-Lighted Marker for Lateral Motion	
722 X32	2.3	Light buoy X32, starboard, 1.4m Buoy, 13a, Seasonal, CCG	2	4	Prescott DLD 200mm	Q 1s	Red	Incandescent White		0.55 A	9	3	1.5				1964	A-Light, C-Radar Target, 1-Visual Marker on Hazard, 2-Lighted Marker on Hazard, 11-Visual Marker on Turn, 12-Lighted Marker on Turn, 15-Radar Target on Hazard Turn or Boundary
730.7 X50	2.3	St. Clair Cutoff light buoy X50, starboard, 1.4m Buoy, 13a, Seasonal, CCG	2	4	Prescott DLD 200mm	Fl 4s	Red	Incandescent White		0.55 A	12	3	2.4				1968	A-Light, C-Radar Target, 1-Visual Marker on Hazard, 2-Lighted Marker on Hazard, 15-Radar Target on Hazard Turn or Boundary
731.2 A14	2.3	St. Clair Cutoff light buoy A14, starboard, 1.4m Buoy, 13a, Seasonal, CCG	2	4	Prescott DLD 200mm	Fl 4s	Red	Incandescent White		0.55 A	12	3	2.4				1974	A-Light, C-Radar Target, 1-Visual Marker on Hazard, 2-Lighted Marker on Hazard, 15-Radar Target on Hazard Turn or Boundary
737.5 A22	2.3	Light buoy A22, starboard, 1.4m Buoy, 13a, Seasonal, CCG	2	4	Prescott DLD 200mm	Fl 4s	Red	Incandescent White		0.55 A	12	3	2.4				1968	A-Light, C-Radar Target, 1-Visual Marker on Hazard, 2-Lighted Marker on Hazard, 15-Radar Target on Hazard Turn or Boundary
740 A30	2.3	Walpole Island light buoy A30, starboard, 1.4m Buoy, 13a, Seasonal, CCG	2	4	Prescott DLD 200mm	Fl 4s	Red	Incandescent White		0.55 A	12	3	2.4				1964	A-Light, C-Radar Target, 1-Visual Marker on Hazard, 2-Lighted Marker on Hazard, 15-Radar Target on Hazard Turn or Boundary
745 A36	2.3	Chenal Ecarte Shoal light buoy A36, starboard, 1.4m Buoy, 13a, Seasonal, CCG	2	4	Prescott DLD 200mm	Fl 4s	Red	Incandescent White		0.55 A	12	3	2.4				1964	A-Light, C-Radar Target, 1-Visual Marker on Hazard, 2-Lighted Marker on Hazard, 15-Radar Target on Hazard Turn or Boundary



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MARINE AIDS

SITE INVENTORY AND TECHNICAL DATA

Date:	October 28, 2004
District:	Central & Arctic, Prescott
Chart:	US14853, US14852
Site:	St. Clair River

Description			Day-light Visual Range	Radar Range	Light signal								Sound Signal		General History		
Aid No.	General Category	Particulars			Lantern Type and Size	Rotation Flash Duration	Lens Type and Colour	Bulb				Nominal Range	Luminous Range	Horn	Nominal Range	Year Est.	Circumstances Etc.
	(See summary)	(Name Type Size Seasonality)						Nautical Miles	Type	Voltage	Amps Watts						
749.1 A42/2	2.3	Stokes Point light buoy A42/2, starboard, 1.4m Buoy, 13a, Seasonal, CCG	2	4	Prescott DLD 200mm	Fl 4s	Red	Incandescent White		0.55 A	12	3	2.4			2002	A-Light, C-Radar Target, 1-Visual Marker on Hazard, 2-Lighted Marker on Hazard, 11-Visual Marker on Turn, 12-Lighted Marker on Turn, 15-Radar Target on Hazard Turn or Boundary
751 A44	2.3	Recoors Point light buoy A44, starboard, 1.4m Buoy, 13a, Seasonal, CCG	2	4	Prescott DLD 200mm	Fl 4s	Red	Incandescent White		0.55 A	12	3	2.4			1964	A-Light, C-Radar Target, 1-Visual Marker on Hazard, 2-Lighted Marker on Hazard, 11-Visual Marker on Turn, 12-Lighted Marker on Turn, 15-Radar Target on Hazard Turn or Boundary
752.5 A46	2.3	Harts Landing light buoy A46, starboard, 1.4m Buoy, 13a, Seasonal, CCG	2	4	Prescott DLD 200mm	Fl 4s	Red	Incandescent White		0.55 A	12	3	2.4			1967	A-Light, C-Radar Target, 1-Visual Marker on Hazard, 2-Lighted Marker on Hazard, 15-Radar Target on Hazard Turn or Boundary
757 A54	2.3	Middle Ground light buoy A54, starboard, 1.4m Buoy, 13a, Seasonal, CCG	2	4	Prescott DLD 200mm	Q 1s	Red	Incandescent White		0.55 A	9	3	1.5			1964	A-Light, C-Radar Target, 1-Visual Marker on Hazard, 2-Lighted Marker on Hazard, 11-Visual Marker on Turn, 12-Lighted Marker on Turn, 15-Radar Target on Hazard Turn or Boundary
758 AMB	2.3	Stag Island bifurcation light buoy AMB, starboard bifurcation, 1.4m Buoy, 13a, Seasonal, CCG	2	4	Prescott DLD 200mm	Fl(2+1) 6s	Red	Incandescent White		0.55 A	9	3	2.4			1964	A-Light, C-Radar Target, 1-Visual Marker on Hazard, 2-Lighted Marker on Hazard, 11-Visual Marker on Turn, 12-Lighted Marker on Turn, 15-Radar Target on Hazard Turn or Boundary, 21-Alternative Route
763 AM3	2.3	Stag Island North End light buoy AM3, port, 1.4m Buoy, 13a, Seasonal, CCG	2	4	Prescott DLD 200mm	Fl 4s	Green	Incandescent White		0.55 A	11	3	2.4			1968	A-Light, C-Radar Target, 1-Visual Marker on Hazard, 2-Lighted Marker on Hazard, 15-Radar Target on Hazard Turn or Boundary
764 AM	2.3	Stag Island North Cardinal light buoy AM, north cardinal, 1.4m Buoy, 13a, Seasonal, CCG	2	4	Prescott DLD 200mm	Q 1s	White	Incandescent White		0.55 A	40	4	2.9			1964	A-Light, C-Radar Target, 1-Visual Marker on Hazard, 2-Lighted Marker on Hazard, 15-Radar Target on Hazard Turn or Boundary, 21-Alternative Route
765 A80	2.3	St Clair River light buoy A80, starboard, 1.4m Buoy, 13a, Seasonal, CCG	2	4	Prescott DLD 200mm	Fl 4s	Red	Incandescent White		0.55 A	12	3	2.4			1967	A-Light, C-Radar Target, 7-Visual Boundary Marker, 8-Lighted Boundary Marker, 13-Visual Marker on Off-Track Hazard, 14-Lighted Marker on Off-Track Hazard, 15-Radar Target on Hazard Turn or Boundary
765.2 AHB	2.3	Sarnia Breakwater light buoy AHB, starboard bifurcation, 1.4m Buoy, 13a, Seasonal, CCG	2	4	Prescott DLD 200mm	Fl(2+1) 6s	Red	Incandescent White		0.55 A	9	3	2.4			1982	A-Light, C-Radar Target, 1-Visual Marker on Hazard, 2-Lighted Marker on Hazard, 11-Visual Marker on Turn, 12-Lighted Marker on Turn, 15-Radar Target on Hazard Turn or Boundary, 21-Alternative Route
766 A86	2.3	Bay Point light buoy A86, starboard, 1.4m Buoy, 13a, Seasonal, CCG	2	4	Prescott DLD 200mm	Fl 4s	Red	Incandescent White		0.55 A	12	3	2.4			1965	A-Light, C-Radar Target, 7-Visual Boundary Marker, 8-Lighted Boundary Marker, 15-Radar Target on Hazard Turn or Boundary
766.8 A88	2.3	Light buoy A88, starboard, 1.4m Buoy, 13a, Seasonal, CCG	2	4	Prescott DLD 200mm	Q 1s	Red	Incandescent White		0.55 A	9	3	1.5			1991	A-Light, C-Radar Target, 1-Visual Marker on Hazard, 2-Lighted Marker on Hazard, 11-Visual Marker on Turn, 12-Lighted Marker on Turn, 15-Radar Target on Hazard Turn or Boundary



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MARINE AIDS

SITE INVENTORY AND TECHNICAL DATA

Date:	October 28, 2004
District:	Central & Arctic, Prescott
Chart:	US14853, US14852
Site:	St. Clair River

Description			Day-light Visual Range	Radar Range	Light signal								Sound Signal			General History		
Aid No.	General Category	Particulars			Lantern Type and Size	Rotation Flash Duration	Lens Type and Colour	Bulb				Nominal Range	Luminous Range	Horn	Nominal Range	Year Est.	Circumstances E to.	
	(See summary)	(Name Type Size Seasonality)						Nautical Miles	Type	Voltage	Amps Watts	Candelas	N. Miles	db	Hz			N. Miles
770 2	2.3	Lake Huron Cut light buoy 2, starboard, 1.8m Buoy, 13a, Seasonal, CCG	4	5	Prescott DLD 200mm	Q 1s	Red	Incandescent White		0.55 A	9	3	1.5				1964	A-Light, C-Radar Target, 1-Visual Marker on Hazard, 2-Lighted Marker on Hazard, 11-Visual Marker on Turn, 12-Lighted Marker on Turn, 15-Radar Target on Hazard Turn or Boundary
738 A24	2.4	South Channel light buoy A24, starboard, 0.6m SB 60 Conical Plastic spar, 17a, Seasonal, CCG	2	4	Carmanah 702 Carmanah - Model 702	Fl 4s	Red	LED White			12	3	2.4				1964	A-Light, C-Radar Target, 1-Visual Marker on Hazard, 2-Lighted Marker on Hazard, 15-Radar Target on Hazard Turn or Boundary
7000 A28	2.5	A28, starboard, 0.6m Spar Conical (Long), 14b, Year Round, CCG	1	2													1964	B-Reflective Material, C-Radar Target, 1-Visual Marker on Hazard, 15-Radar Target on Hazard Turn or Boundary
7001 A62	2.5	A62, starboard, 0.6m Spar Conical (Long), 14b, Year Round, CCG	1	2													1964	B-Reflective Material, C-Radar Target, 1-Visual Marker on Hazard, 11-Visual Marker on Turn, 15-Radar Target on Hazard Turn or Boundary
7002 A64	2.5	A64, starboard, 0.6m Spar Conical (Long), 14b, Year Round, CCG	1	2													1964	B-Reflective Material, C-Radar Target, 1-Visual Marker on Hazard, 15-Radar Target on Hazard Turn or Boundary
7003 AH2	2.5	AH2, starboard, 0.6m Spar Conical (Long), 14b, Year Round, CCG	1	2													1964	B-Reflective Material, C-Radar Target, 13-Visual Marker on Off-Track Hazard
7006 AM2	2.5	AM2, starboard, 0.6m Spar Conical (Long), 14b, Year Round, CCG	1	2													1964	B-Reflective Material, C-Radar Target, 13-Visual Marker on Off-Track Hazard
7009 ATB	2.5	ATB, starboard bifurcation, 0.6m Spar Conical (Long), 14b, Year Round, CCG	1	2													1964	B-Reflective Material, C-Radar Target, 1-Visual Marker on Hazard, 21-Alternative Route
7011 X33	2.5	X33, port, 0.6m Spar Can (Long), 14b, Year Round, CCG	1	2													1964	B-Reflective Material, C-Radar Target, 1-Visual Marker on Hazard, 15-Radar Target on Hazard Turn or Boundary
7012 X34	2.5	X34, starboard, 0.6m Spar Conical (Long), 14b, Year Round, CCG	1	2													1964	B-Reflective Material, C-Radar Target, 1-Visual Marker on Hazard, 15-Radar Target on Hazard Turn or Boundary
7013 X37	2.5	X37, port, 0.6m Spar Can (Long), 14b, Year Round, CCG	1	2													1964	B-Reflective Material, C-Radar Target, 1-Visual Marker on Hazard, 15-Radar Target on Hazard Turn or Boundary
7015 X41	2.5	X41, port, 0.6m Spar Can (Long), 14b, Year Round, CCG	1	2													1964	B-Reflective Material, C-Radar Target, 1-Visual Marker on Hazard, 15-Radar Target on Hazard Turn or Boundary
7016 X42	2.5	X42, starboard, 0.6m Spar Conical (Long), 14b, Year Round, CCG	1	2													1964	B-Reflective Material, C-Radar Target, 1-Visual Marker on Hazard, 15-Radar Target on Hazard Turn or Boundary



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MARINE AIDS

SITE INVENTORY AND TECHNICAL DATA

Date:	October 28, 2004
District:	Central & Arctic, Prescott
Chart:	US14853, US14852
Site:	St. Clair River

Description			Day-light Visual Range	Radar Range	Light signal								Sound Signal			General History	
Aid No.	General Category	Particulars			Lantern Type and Size	Rotation Flash Duration	Lens Type and Colour	Bulb				Nominal Range	Luminous Range	Horn	Nominal Range	Year Est.	Circumstances E to.
	(See summary)	(Name Type Size Seasonality)	Nautical Miles					Type	Voltage	Amps Watts	Candelas			db	Hz	N. Miles	
7017 X45	2.5	X45, port, 0.6m Spar Can (Long), 14b, Year Round, CCG	1	2												1964	B-Reflective Material, 1-Visual Marker on Hazard
7018 X46	2.5	X46, starboard, 0.6m Spar Conical (Long), 14b, Year Round, CCG	1	2												1964	B-Reflective Material, C-Radar Target, 1-Visual Marker on Hazard, 15-Radar Target on Hazard Turn or Boundary
7019 XE	2.5	XE, north cardinal, 0.6m Spar Can (Long), 14b, Year Round, CCG	1	2												1964	B-Reflective Material, C-Radar Target, 1-Visual Marker on Hazard, 15-Radar Target on Hazard Turn or Boundary
7020 XE72	2.5	XE72, starboard, 0.6m Spar Conical (Long), 14b, Year Round, CCG	1	2												1964	B-Reflective Material, C-Radar Target, 1-Visual Marker on Hazard, 15-Radar Target on Hazard Turn or Boundary
7021 XS	2.5	XS, east cardinal, 0.6m Spar Can (Long), 14b, Year Round, CCG	1	2												1964	B-Reflective Material, C-Radar Target, 1-Visual Marker on Hazard, 15-Radar Target on Hazard Turn or Boundary, 21-Alternative Route
724 X36	2.5	X36, starboard, 0.6m Spar Conical (Long), 14b, Year Round, CCG	1	2												2004	B-Reflective Material, C-Radar Target, 1-Visual Marker on Hazard, 15-Radar Target on Hazard Turn or Boundary, permanently discontinued and replaced with spar buoy
726 X40	2.5	X40, starboard, 0.6m Spar Conical (Long), 14b, Year Round, CCG	1	2												2004	B-Reflective Material, C-Radar Target, 1-Visual Marker on Hazard, 15-Radar Target on Hazard Turn or Boundary, permanently discontinued and replaced with spar buoy
7004 AH3	2.7	AH3, port, 0.3m Spar Can-Plastic (ORT), 17b, Year Round, CCG	0.25	1												1964	B-Reflective Material, 1-Visual Marker on Hazard
7005 AH5	2.7	AH5, port, 0.3m Spar Can-Plastic (ORT), 17b, Year Round, CCG	0.25	1												1964	B-Reflective Material, 1-Visual Marker on Hazard, 11-Visual Marker on Turn
7007 AS2	2.7	AS2, starboard, 0.3m Spar-Conical Plastic (ORT), 17b, Year Round, CCG	0.25	1												1964	B-Reflective Material, 1-Visual Marker on Hazard
7008 ASB	2.7	ASB, starboard bifurcation, 0.3m Spar-Conical Plastic (ORT), 17b, Year Round, CCG	0.25	1												1964	B-Reflective Material, 11-Visual Marker on Turn, 21-Alternative Route
710	2.9	St. Clair Cut-Off Channel bifurcation light buoy (U.S.), port bifurcation, 1.8m Buoy, 13a, Seasonal, U.S.	4	5		Fl(2+1) 6s	Green	White				4					A-Light, C-Radar Target, 1-Visual Marker on Hazard, 2-Lighted Marker on Hazard, 11-Visual Marker on Turn, 12-Lighted Marker on Turn, 15-Radar Target on Hazard Turn or Boundary, 21-Alternative Route
736.6 15	2.9	Light buoy 15 (U.S.), port, 1.8m Buoy, 13a, Seasonal, U.S.	4	5		Fl 4s	Green	White				4					A-Light, C-Radar Target, 1-Visual Marker on Hazard, 2-Lighted Marker on Hazard, 15-Radar Target on Hazard Turn or Boundary



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MARINE AIDS

SITE INVENTORY AND TECHNICAL DATA

Date:	October 28, 2004
District:	Central & Arctic, Prescott
Chart:	US14853, US14852
Site:	St. Clair River

Description			Day-light Visual Range	Radar Range	Light signal								Sound Signal			General History	
Aid No.	General Category	Particulars			Lantern Type and Size	Rotation Flash Duration	Lens Type and Colour	Bulb				Nominal Range	Luminous Range	Horn	Nominal Range	Year Est	Circumstances Etc.
	(See summary)	(Name Type Size Seasonality)	Nautical Miles					Type	Voltage	Amps Watts	Candelas	N. Miles		db Hz	N. Miles		
736.7 16	2.9	Light buoy 16 (U.S.), starboard, 1.8m Buoy, 13a, Seasonal, U.S.	4	5		Fl 4s	Red	White				4					A-Light, C-Radar Target, 1-Visual Marker on Hazard, 2-Lighted Marker on Hazard, 15-Radar Target on Hazard Turn or Boundary
736.8 17	2.9	Light buoy 17 (U.S.), port, 1.8m Buoy, 13a, Seasonal, U.S.	4	5		Fl 4s	Green	White				4					A-Light, C-Radar Target, 1-Visual Marker on Hazard, 2-Lighted Marker on Hazard, 11-Visual Marker on Turn, 12-Lighted Marker on Turn, 15-Radar Target on Hazard Turn or Boundary
739.2 27	2.9	Grande Pointe light buoy 27 (U.S.), port, 1.8m Buoy, 13a, Seasonal, U.S.	4	5		Fl 4s	Green	White				4					A-Light, C-Radar Target, 1-Visual Marker on Hazard, 2-Lighted Marker on Hazard, 15-Radar Target on Hazard Turn or Boundary
743.5	2.9	Russell Island Shoal light buoy (U.S.), port bifurcation, 1.8m Buoy, 13a, Seasonal, U.S.	4	5		Fl(2+1) 6s	Green	White				4					A-Light, C-Radar Target, 1-Visual Marker on Hazard, 2-Lighted Marker on Hazard, 15-Radar Target on Hazard Turn or Boundary, 21-Alternative Route
747.5 37	2.9	Roberts Landing light buoy 37 (U.S.), port, 1.8m Buoy, 13a, Seasonal, U.S.	4	5		Fl 4s	Green	White				4					A-Light, C-Radar Target, 1-Visual Marker on Hazard, 2-Lighted Marker on Hazard, 11-Visual Marker on Turn, 12-Lighted Marker on Turn, 15-Radar Target on Hazard Turn or Boundary
747.6 38	2.9	Fawn Island light buoy 38 (U.S.), starboard, 1.8m Buoy, 13a, Seasonal, U.S.	4	5		Fl 4s	Red	White				4					A-Light, C-Radar Target, 1-Visual Marker on Hazard, 2-Lighted Marker on Hazard, 15-Radar Target on Hazard Turn or Boundary
748.2 40	2.9	Marine City Shoal light buoy 40 (U.S.), starboard, 1.8m Buoy, 13a, Seasonal, U.S.	4	5		Fl 4s	Red	White				4					A-Light, C-Radar Target, 7-Visual Boundary Marker, 8-Lighted Boundary Marker, 11-Visual Marker on Turn, 12-Lighted Marker on Turn, 15-Radar Target on Hazard Turn or Boundary
748.3 42	2.9	Fawn Island Upper End light buoy 42 (U.S.), starboard, 1.8m Buoy, 13a, Seasonal, U.S.	4	5		Q 1s	Red	White				3					A-Light, C-Radar Target, 1-Visual Marker on Hazard, 2-Lighted Marker on Hazard, 11-Visual Marker on Turn, 12-Lighted Marker on Turn, 15-Radar Target on Hazard Turn or Boundary
753.2 48	2.9	St. Clair Middle Ground light buoy 48 (U.S.), starboard, 1.8m Buoy, 13a, Seasonal, U.S.	4	5		Q 1s	Red	White				3					A-Light, C-Radar Target, 1-Visual Marker on Hazard, 2-Lighted Marker on Hazard, 15-Radar Target on Hazard Turn or Boundary
753.5 50	2.9	St. Clair Middle Ground light buoy 50 (U.S.), starboard, 1.8m Buoy, 13a, Seasonal, U.S.	4	5		Fl 4s	Red	White									A-Light, C-Radar Target, 1-Visual Marker on Hazard, 2-Lighted Marker on Hazard, 11-Visual Marker on Turn, 12-Lighted Marker on Turn, 15-Radar Target on Hazard Turn or Boundary
754 52	2.9	St. Clair Middle Ground light buoy 52 (U.S.), starboard, 1.8m Buoy, 13a, Seasonal, U.S.	4	5		Q 1s	Red	White				3					A-Light, C-Radar Target, 1-Visual Marker on Hazard, 2-Lighted Marker on Hazard, 11-Visual Marker on Turn, 12-Lighted Marker on Turn, 15-Radar Target on Hazard Turn or Boundary
757.5 55	2.9	Stag Island Lower light buoy 55 (U.S.), port, 1.8m Buoy, 13a, Seasonal, U.S.	4	5		Fl 4s	Red	White				4					A-Light, C-Radar Target, 1-Visual Marker on Hazard, 2-Lighted Marker on Hazard, 11-Visual Marker on Turn, 12-Lighted Marker on Turn, 15-Radar Target on Hazard Turn or Boundary

MARINE AIDS

SITE INVENTORY AND TECHNICAL DATA

Date:	October 28, 2004
District:	Central & Arctic, Prescott
Chart:	US14853, US14852
Site:	St. Clair River

Description			Day-light Visual Range	Radar Range	Light signal								Sound Signal			General History	
Aid No.	General Category	Particulars			Lantern Type and Size	Rotation Flash Duration	Lens Type and Colour	Bulb				Nominal Range	Luminous Range	Horn	Nominal Range	Year Est.	Circumstances Etc.
	(See summary)	(Name Type Size Seasonality)	Nautical Miles	Type				Voltage	Amps Watts	Candelas	N. Miles	db	Hz	N. Miles			
760 56	2.9	Stag Island Shoal light buoy 56 (U.S.), starboard, 1.8m Buoy, 13a, Seasonal, U.S.	4	5		Fl 4s	Red	White				4					A-Light, C-Radar Target, 1-Visual Marker on Hazard, 2-Lighted Marker on Hazard, 15-Radar Target on Hazard Turn or Boundary
760.6 56	2.9	Light buoy 56 (U.S.), starboard, 1.8m Buoy, 13a, Seasonal, U.S.	4	5		Fl 4s	Red	White				4					A-Light, C-Radar Target, 1-Visual Marker on Hazard, 2-Lighted Marker on Hazard, 11-Visual Marker on Turn, 12-Lighted Marker on Turn, 15-Radar Target on Hazard Turn or Boundary



Fisheries and Oceans Canada
MARINE SAIDS
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PRELIMINARY THREAT RATING

DATE	December 2004
DISTRICT/REGION	Prescott Central
CHARTS	US 14848 / US 14853
SITE	St. Clair River

Vessel Category	SIZE AND TYPE OF VESSELS					SUBMERGED HAZARDS				TYPES OF THREATS																		
	LENGTH (feet)	GROSS TONNAGE	BEAM (feet)	DRAUGHT (feet)	GENERAL TYPES	NON-THREATENING UNDER KEEL CLEARANCE (feet)		MINIMUM DEPTH ALLOWANCE (feet)		COLUMN A - Significant								COLUMN B - Highly Significant										
										DISTANCE FROM HAZARD	DISTANCE FROM OTHER VESSEL WHEN PASSING	MINIMUM CHANNEL WIDTH		ANGLE OF TURN IN CHANNEL		WIND SPEED		WAVE HEIGHT		CURRENT SPEED				VISIBILITY				
																				ALONG TRACK		ACROSS TRACK						
																				3.9		1.5			2.2 / 5.4			
																				(feet)		(feet)			(feet)		(feet)	
OTHER	GIVEN	INNER	OUTER	A	B	A	B	A	B	A	B	A	B	A	B	A	B	A	B	A	B							
	1000+	80000-300000	140-200	54-80			15			1000	800	300	200	1000	800	15	20	20	30	3	6	2	3	1	2	3	2	
1	1000+	32000-37000	105	26-40	26	Laker, Bulk Freighter and Self Unloader (US)	1	15	27		1000	800	300	200	1000	800	15	20	20	30	3	6	2	3	1	2	3	2
	800-1000	30000-100000	95-175	26-64		Ocean-going Tanker, Ore and Bulk Carrier		15		1000	800	300	200	1000	800	15	20	20	30	3	6	2	3	1	2	3	2	
1	730-1000	12000-28000	70-105	26-40	26	Laker, Bulk Freighter and Self Unloader	1	15	27		800	400	300	200	1000	800	20	30	10	30	1.5	3	2	4	1	3	3	2
1	630-800	10000-80000	60-140	20-54	26	Tanker, Ore and Bulk Carrier, General Cargo	1	15	27		800	400	200	100	1000	800	20	30	10	20	1.5	3	4	7	1	3	3	1.5
1	700-730	11000-25000	62-78	21-35	26	Laker, Bulk Freighter and Self Unloader	1	15	27		800	400	200	100	1000	500	20	30	10	20	1	2.5	4	7	1	2	3	1
1	550-830	8000-30000	55-105	20-42	26	Tanker, Ore and Bulk Carrier, General Cargo	1	15	27		800	400	200	100	800	500	20	35	20	30	1	2.5	5	7	1	3	2	1
1	300-550	2500-20000	43-105	16-38	26	Tanker, Ore and Bulk Carrier, General Cargo	1	15	27		500	300	200	100	800	400	20	35	20	30	1	2.5	5	7	1	3	2	1
	300-600	2500-13000	58-90	13-20		Car Ferry		15		1000	800	400	300	800	400	20	35	20	30	1	2.5	5	7	1	3	3	1.5	
2	200-300	10-1500	12-70		10	Car Ferry	2	10	12		500	300	300	100	400	200	30	45	25	30	1	2.5	3	6	2	4	2	1
1	200-300	2000-3500	23-65	9-20	20	Tanker, Bulk Freighter, Self Unloader, Fish Factory	1	15	21		400	300	200	100	800	200	30	40	25	30	1	2.5	5	7	1	3	2	1
1	200-250	2000-3000	40-60	8-20	20	Small Tanker, General Cargo, Fishing (Long Liner)	2	10	22		300	200	200	100	400	200	30	45	25	30	1	2.5	3	6	1.5	3	2	1
1	150-200	1500-2500	30-50	6-15	15	Small Tanker, General Cargo, Fishing (Long Liner)	2	10	17		300	200	200	100	300	200	30	45	25	30	1	2	3	6	1	2	2	1
1	90-150	200-800	12-50	4-15	15	Small Tanker, General Cargo, Fishing (Dragger, Long Liner)	2	10	17		300	150	200	100	300	200	30	45	20	30	1	2	3	4	1	2	2	1
2	65-100	40-250	13-28	5-15	15	Tugs, Small Draggers, Long Liners, Pleasure Craft	2	4	17		200	100	100	50	300	200	30	45	20	30	1	2	3	4	1	2	1.5	1
2	45-65	20-160	9-16	4-15	15	Tugs, Work Boats, Small Draggers, Inshore Long Liners, Pleasure Craft	2	4	17		200	100	100	50	300	200	30	45	20	30	1	2	3	4	1	2	1.5	1
2	32-45	8-50	4-14	3-9	9	Tugs, Work Boats, Fishing (Cape Islanders, Trollers), Pleasure Craft	3	4	12		200	100	100	50	200	100	30	50	20	30	1	2	3	4	2	3	1.5	1
2	25-35	4-20	4-11	3-5	5	Tugs, Work Boats, Fishing Trollers, Pleasure Craft	3	4	8		100	75	50	30	100	50	40	60	20	25	1	1.5	4	5	2	4	1	0.5
3	12-25	1-7	3-8	2-4	4	Tugs, Work Boats, Fishing Trollers, Pleasure Craft	3	4	7		100	50	40	20	100	50	50	70	10	20	1	1.5	4	5	3	5	1	0.5
	300	10-1000	12-80	2-5		Athabasca River Tugs and Barges		1.5			75	25	200	100	150	100	40	60	20	40	N/A	N/A	5	7	4	6	1	0.5
	up to 950	10000	160	6		Mackenzie River Tugs and Barges - Upstream		3			100	26	400	200	300	250	90	120	30	40	1	1.5	5	7	2	3	1	0.5
	up to 950	10000	160	6		Mackenzie River Tugs and Barges - Downstream		5			200	27	400	200	400	300	40	60	25	35	1	1.5	5	7	1	2	2	1



COMPOSITE THREATS	THREAT RATING			NAVIGATIONAL NEEDS		RATING OF GENERAL FEATURES (ABILITY TO REDUCE THREATS)			LOCAL MEANS / FEATURES FOR MEETING NEEDS		AIDS PROVIDED		COMMENTS	
	1. Overriding Importance	2. Highly Significant	3. Significant	For standard aids systems features to reduce threats.		A. Greatly Reduces B. Significantly Reduces C. Somewhat Reduces or Reduces for Some Vessels Only			Specify and Rate as: 1. Fully Adequate 2. Partially Adequate 3. Marginally Useful	List All Established Aids that Contribute to Reducing Each Threat by Relevant Generic Aids System Feature				
	4. Little Significance	5. Not Applicable	MARK AN X BESIDE MOST APPROPRIATE FEATURES TO REDUCE THREATS	CAT-I C-COMM	CAT-II U-COMM	CAT-III P-CRAFT	NOTE: Any one aid may be listed several times.							
1. Sea Conditions	3	3	3	5	Visual Markers for Lateral Motion	x	A		A	charted buildings, towers, stacks forming transit lines	3	709.3, 709.4, 732, 733, 737.6, 737.7, 746, 747, 766.4, 766.5, 768, 769	leading lines are provided for all users	
				1	Visual Markers on Relevant Hazards	x	A		A	A	shoreline	709.3, 710, X32/2, X35, X36, X39, X40, X43, X44, X47, X48, 11, X50, A14, 10, 13, 16, 17, 15, 16, 17, A20, A22, 737.6, 23, A24, A26, 27, A30, 740.2, A32, 33, 743, 743.5, A36, 747.2, 37, 38, 748, 42, A42/2, A44, 752.2, A46, 48, 50, 52, A54, 55, AMB, 759, 56, 760.5, 58, AM, 764.5, AHB, 765.5, A66, 766.4, A68, 2, 1, A28, A62, A64, AH2, AH3, AH5, AM2, AS2, ATB, X33, X34, X37, X38, X41, X42, X45, X46, XE, XE72, XS	hazard markers are provided for all users	
				3	Distinct Visual Markers for Position					charted shoreline, buildings, towers, stacks, bridge	2	13, 16, 743, A34, 750, 752, 756, 759, 760.5	position fixing markers are provided for all users	
				7	Visual Boundary Markers					shoreline	2	X32, 40, AM3, A60	boundary markers are provided for all users	
				13	Visual Markers on Off-Track Hazards					shoreline		A34, 753, 759	markers on off-track hazards are provided for recreational users	
2. Proximity of Hazards	1	3	4	7	Visual Boundary Markers					shoreline	3	X32, 40, AM3, A60	boundary markers are provided for all users	
				1	Visual Markers on Relevant Hazards	x	A		A	A	shoreline	3	709.3, 710, X32/2, X35, X36, X39, X40, X43, X44, X47, X48, 11, X50, A14, 10, 13, 16, 17, 15, 16, 17, A20, A22, 737.6, 23, A24, A26, 27, A30, 740.2, A32, 33, 743, 743.5, A36, 747.2, 37, 38, 748, 42, A42/2, A44, 752.2, A46, 48, 50, 52, A54, 55, AMB, 759, 56, 760.5, 58, AM, 764.5, AHB, 765.5, A66, 766.4, A68, 2, 1, A28, A62, A64, AH2, AH3, AH5, AM2, AS2, ATB, X33, X34, X37, X38, X41, X42, X45, X46, XE, XE72, XS	hazard markers are provided for all users
				5	Visual Markers for Lateral Motion	x	A		A	A	charted buildings, towers, stacks forming transit lines	3	709.3, 709.4, 732, 733, 737.6, 737.7, 746, 747, 766.4, 766.5, 768, 769	leading lines are provided for all users
				13	Visual Markers on Off-Track Hazards					shoreline		A34, 753, 759	markers on off-track hazards are provided for recreational users	
				3	Distinct Visual Markers for Position					charted shoreline, buildings, towers, stacks, bridge	3	13, 16, 743, A34, 750, 752, 756, 759, 760.5	position fixing markers are provided for all users	
3. Complexity of Channel	3	3	4	7	Visual Boundary Markers					shoreline	2	X32, 40, AM3, A60	boundary markers are provided for all users	
				5	Visual Markers for Lateral Motion	x	A		A	A	charted buildings, towers, stacks forming transit lines	3	709.3, 709.4, 732, 733, 737.6, 737.7, 746, 747, 766.4, 766.5, 768, 769	leading lines are provided for all users
				11	Visual Markers on Turns	x	A		A	B	shoreline	3	710, X32/2, X32, X47, 11, 17, A20, A26, A32, 33, 747.2, 37, 40, 42, A42/2, A44, 753, 50, 52, A54, 55, AMB, 56, 760.5, 58, 764.5, A66, A68, 2, 1, A28, A62, AH5, ASB, XS	markers on turns are provided for all users
				1	Visual Markers on Relevant Hazards	x	A		B	B	shoreline	3	709.3, 710, X32/2, X35, X36, X39, X40, X43, X44, X47, X48, 11, X50, A14, 10, 13, 16, 17, 15, 16, 17, A20, A22, 737.6, 23, A24, A26, 27, A30, 740.2, A32, 33, 743, 743.5, A36, 747.2, 37, 38, 748, 42, A42/2, A44, 752.2, A46, 48, 50, 52, A54, 55, AMB, 759, 56, 760.5, 58, AM, 764.5, AHB, 765.5, A66, 766.4, A68, 2, 1, A28, A62, A64, AH2, AH3, AH5, AM2, AS2, ATB, X33, X34, X37, X38, X41, X42, X45, X46, XE, XE72, XS	hazard markers are provided for all users
				3	Distinct Visual Markers for Position					charted shoreline, buildings, towers, stacks, bridge	2	13, 16, 743, A34, 750, 752, 756, 759, 760.5	position fixing markers are provided for all users	
4. Diminished Room to Manoeuvre	1	3	4	7	Visual Boundary Markers					shoreline	2	X32, 40, AM3, A60	boundary markers are provided for all users	
				1	Visual Markers on Relevant Hazards	x	A		A	A	shoreline	3	709.3, 710, X32/2, X35, X36, X39, X40, X43, X44, X47, X48, 11, X50, A14, 10, 13, 16, 17, 15, 16, 17, A20, A22, 737.6, 23, A24, A26, 27, A30, 740.2, A32, 33, 743, 743.5, A36, 747.2, 37, 38, 748, 42, A42/2, A44, 752.2, A46, 48, 50, 52, A54, 55, AMB, 759, 56, 760.5, 58, AM, 764.5, AHB, 765.5, A66, 766.4, A68, 2, 1, A28, A62, A64, AH2, AH3, AH5, AM2, AS2, ATB, X33, X34, X37, X38, X41, X42, X45, X46, XE, XE72, XS	hazard markers are provided for all users
				5	Visual Markers for Lateral Motion	x	A		B	B	charted buildings, towers, stacks forming transit lines	3	709.3, 709.4, 732, 733, 737.6, 737.7, 746, 747, 766.4, 766.5, 768, 769	leading lines are provided for all users
				3	Distinct Visual Markers for Position					charted shoreline, buildings, towers, stacks, bridge	3	13, 16, 743, A34, 750, 752, 756, 759, 760.5	position fixing markers are provided for all users	



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Canada



MARINE AIDS
NEEDS MATRIX - INNER APPROACHES / CONFINED WATERS

DATE	December 2004
DISTRICT/REGION	Prescott/Central
CHARTS	US14848, US14853
SITE	St. Clair River

COMPOSITE THREATS	THREAT RATING			NAVIGATIONAL NEEDS			RATING OF GENERAL FEATURES (ABILITY TO REDUCE THREATS)			LOCAL MEANS / FEATURES FOR MEETING NEEDS		AIDS PROVIDED		COMMENTS			
	1. Overriding Importance 2. Highly Significant 3. Significant 4. Little Significance 5. Not Applicable			For standard aids systems features to reduce threats.			A. Greatly Reduces B. Significantly Reduces C. Somewhat Reduces or Reduces for Some Vessels Only			Specify and Rate as: 1. Fully Adequate 2. Partially Adequate 3. Marginally Useful		List All Established Aids that Contribute to Reducing Each Threat by Relevant Generic Aids System Feature					
	CAT-I C-COMM	CAT-II U-COMM	CAT-III P-CRAFT	MARK AN X BESIDE MOST APPROPRIATE FEATURES TO REDUCE THREATS			CAT-I C-COMM	CAT-II U-COMM	CAT-III P-CRAFT	NOTE: Any one aid may be listed several times.							
5. Traffic Density / Mix Crossing / Mooring	2	3	4	23	Traffic Separation	x								alternative route markers are provided for all users; areas of one-way traffic reduce this risk also boundary markers are provided for all users			
				21	Alternative Route	x	A		A				710, X47, 743.5, AMB, 759, AM, AHB, ASB, ATB, XS				
				7	Visual Boundary Markers						shoreline	2	X32, 40, AM3, A60			boundary markers are provided for all users	
				20	Anchorage												
6. Reduced Visibility	3	3	4	8	Lighted Boundary Markers	x	A		A		A	lights on shoreline	2	X32, 40, AM3, A60	lighted boundary markers are provided for commercial users		
				7	Visual Boundary Markers						shoreline	3	X32, 40, AM3, A60		boundary markers are provided for all users		
				2	Lighted Markers on Relevant Hazards	x	B		B		B		709.3, 710, X32/2, X35, X36, X39, X40, X43, X44, X47, X48, 11, X50, A14, 10, 13, 16, 17, 15, 16, 17, A20, A22, 737.6, 23, A24, A26, 27, A30, 740.2, A32, 33, 743, 743.5, A36, 747.2, 37, 38, 748, 42, A42/2, A44, 752.2, A46, 48, 50, 52, A54, 55, AMB, 759, 56, 760.5, 58, AM, 764.5, AHB, 765.5, A66, 766.4, A68, 2, 1		lighted hazard markers are provided for commercial users		
				6	Lighted Markers for Lateral Motion	x	B		B		B	lights on charted buildings, towers, stacks forming transit lines	3	709.3, 709.4, 732, 733, 737.6, 737.7, 746, 747, 766.4, 766.5, 768, 769		leading lights are provided for commercial users	
				4	Distinct Lighted Markers for Position						lights on charted buildings, towers, stacks, bridge	3	13, 16, 743, A34, 750, 752, 756, 759, 760.5		lighted position fixing markers are provided for commercial users		
				19	Distinct Aural Signal for Direction												
				1	Visual Markers on Relevant Hazards						shoreline		709.3, 710, X32/2, X35, X36, X39, X40, X43, X44, X47, X48, 11, X50, A14, 10, 13, 16, 17, 15, 16, 17, A20, A22, 737.6, 23, A24, A26, 27, A30, 740.2, A32, 33, 743, 743.5, A36, 747.2, 37, 38, 748, 42, A42/2, A44, 752.2, A46, 48, 50, 52, A54, 55, AMB, 759, 56, 760.5, 58, AM, 764.5, AHB, 765.5, A66, 766.4, A68, 2, 1, A28, A62, A64, AH2, AH3, AH5, AM2, AS2, ATB, X33, X34, X37, X38, X41, X42, X45, X46, XE, XE72, XS		hazard markers are provided for all users		
				20	Anchorage	x	B		C		C						
				18	Aural Signal on Relevant Hazards												
				14	Lighted Markers on Off-Track Hazards										A34, 753, 759		lighted markers on off-track hazards are provided for commercial users
7. Darkness	1	2	4	A	Lights on Markers	x	A		A		A	local shoreline lighting	3	709.3, 709.4, 710, X32/2, X32, X35, X36, X39, X40, X43, X44, X47, X48, 11, X50, A14, 732, 733, 10, 13, 16, 17, 15, 16, 17, A20, A22, 737.6, 737.7, 23, A24, A26, 27, A30, 740.2, 741, A32, 33, 743, 743.5, A34, A36, 746, 747, 747.2, 37, 38, 748, 40, 42, A42/2, 750, A44, 752, 752.2, A46, 753, 48, 50, 52, 756, A54, 55, AMB, 759, 56, 760.5, 58, AM3, AM, 764.5, A60, AHB, 765.5, A66, 766.4, 766.5, A68, 768, 769, 2, 1		lights on markers are provided for commercial users	
				B	Reflective Material on Markers	x	C		B		B			A28, A62, A64, AH2, AH3, AH5, AM2, AS2, ASB, ATB, X33, X34, X37, X38, X41, X42, X45, X46, XE, XE72, XS		reflective properties on markers are provided for recreational users	
				C	Radar Targets on Markers						shoreline	3	710, X32/2, X32, X35, X36, X38, X40, X43, X44, X47, X48, 11, X50, A14, 732, 10, 16, 15, 16, 17, A20, A22, A24, A26, 27, A30, 741, A32, 743.5, A34, A36, 37, 38, 40, 42, A42/2, A44, A46, 48, 50, 52, 756, A54, 55, AMB, 759, 56, 58, AM3, AM, A60, AHB, A66, 766.4, A68, 2, 1, A28, A62, A64, AH2, AH3, AH5, AM2, ATB, X33, X34, X37, X38, X41, X42, X45, X46, XE, XE72, XS		radar targets are provided for commercial users		



MARINE AIDS
NEEDS MATRIX - INNER APPROACHES / CONFINED WATERS

DATE	December 2004
DISTRICT/REGION	Prescott/Central
CHARTS	US14848, US14853
SITE	St. Clair River

COMPOSITE THREATS	THREAT RATING			NAVIGATIONAL NEEDS			RATING OF GENERAL FEATURES (ABILITY TO REDUCE THREATS)			LOCAL MEANS / FEATURES FOR MEETING NEEDS		AIDS PROVIDED		COMMENTS	
	1. Overriding Importance 2. Highly Significant 3. Significant 4. Little Significance 5. Not Applicable	CAT-I C-COMM	CAT-II U-COMM	CAT-III P-CRAFT	For standard aids systems features to reduce threats.	MARK AN X BESIDE MOST APPROPRIATE FEATURES TO REDUCE THREATS	A. Greatly Reduces	B. Significantly Reduces	C. Somewhat Reduces or Reduces for Some Vessels Only	Specify and Rate as: 1. Fully Adequate 2. Partially Adequate 3. Marginally Useful	List All Established Aids that Contribute to Reducing Each Threat by Relevant Generic Aids System Feature	NOTE: Any one aid may be listed several times.	(Apparent Deficiencies and Surplus Aids)		
8. Ice and Freezing Spray	3	5	5	5	Visual Markers for Lateral Motion	x	A	A	N/A	charted buildings, towers, stacks forming transit lines	3	709.3, 709.4, 732, 733, 737.6, 737.7, 746, 747, 766.4, 766.5, 768, 769	leading lines are provided for all users		
				3	Distinct Visual Markers for Position					charted shoreline, buildings, towers, stacks, bridge	3	13, 16, 743, A34, 750, 752, 756, 759, 760.5	position fixing markers are provided for all users		
				1	Visual Markers on Relevant Hazards					shoreline	3	709.3, 710, X32/2, X35, X36, X39, X40, X43, X44, X47, X48, 11, X50, A14, 10, 13, 16, 17, 15, 16, 17, A20, A22, 737.6, 23, A24, A26, 27, A30, 740.2, A32, 33, 743, 743.5, A36, 747.2, 37, 38, 748, 42, A42/2, A44, 752.2, A46, 48, 50, 52, A54, 55, AMB, 759, 56, 760.5, 58, AM, 764.5, AHB, 765.5, A66, 766.4, A68, 2, 1, A28, A62, A64, AH2, AH3, AH5, AM2, AS2, ATB, X33, X34, X37, X38, X41, X42, X45, X46, XE, XE72, XS	hazard markers are provided for all users		
9. Channel Siltation	5	5	5	9	Moveable Visual Markers										
				3	Distinct Visual Markers for Position					charted shoreline, buildings, towers, stacks, bridge	2	13, 16, 743, A34, 750, 752, 756, 759, 760.5	position fixing markers are provided for all users		
10. Lack of Distinctive Features for Positioning / Pilot Station Boarding	5	5	5	3	Distinct Visual Markers for Position	x	A	A	A	charted shoreline, buildings, towers, stacks, bridge	2	13, 16, 743, A34, 750, 752, 756, 759, 760.5	position fixing markers are provided for all users		
				1	Visual Markers on Relevant Hazards	x	A	A	A	shoreline	3	709.3, 710, X32/2, X35, X36, X39, X40, X43, X44, X47, X48, 11, X50, A14, 10, 13, 16, 17, 15, 16, 17, A20, A22, 737.6, 23, A24, A26, 27, A30, 740.2, A32, 33, 743, 743.5, A36, 747.2, 37, 38, 748, 42, A42/2, A44, 752.2, A46, 48, 50, 52, A54, 55, AMB, 759, 56, 760.5, 58, AM, 764.5, AHB, 765.5, A66, 766.4, A68, 2, 1, A28, A62, A64, AH2, AH3, AH5, AM2, AS2, ATB, X33, X34, X37, X38, X41, X42, X45, X46, XE, XE72, XS	hazard markers are provided for all users		
				17	Distinct Radar Signal for Position or Turn										
				21	Alternative Route					710, X47, 743.5, AMB, 759, AM, AHB, ASB, ATB, XS	alternative route markers are provided for all users				
				20	Anchorage										