



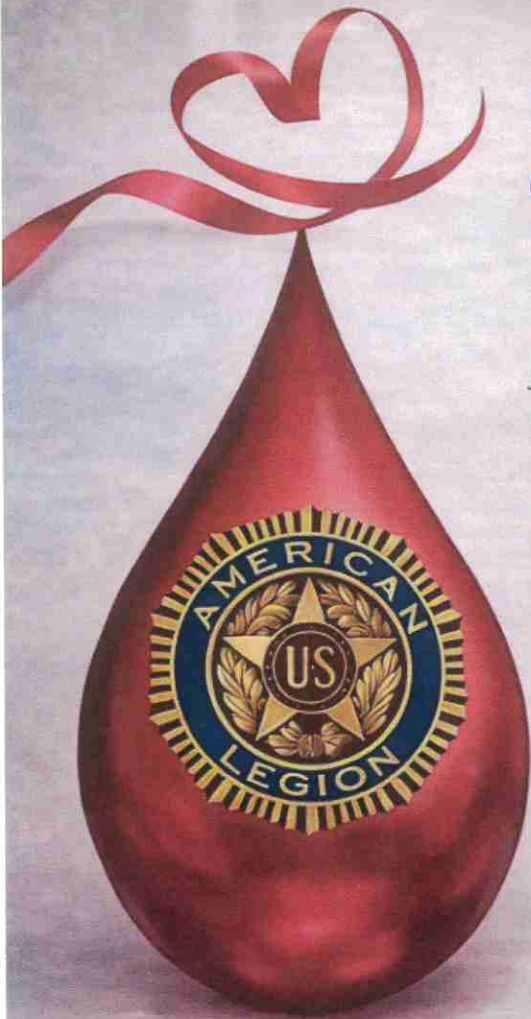
# COMMUNITY BLOOD DRIVE

Received from  
Liliana Armenta

Hosted by American Legion Post 255


In partnership with  American Red Cross


**Veterans Helping Veterans.  
Neighbors Helping Neighbors.** 





## HELP SAVE A LIFE · GIVE THE GIFT OF BLOOD

One blood donation can **save up to THREE lives.**  
Join Veterans, military families, and community members in giving the **Gift of Life.**

 **Location:** American Legion Post 255  
35 E. 18th Street  
National City, CA 91950

 **Date:** Tuesday, April 28, 2026

 **Time:** 10:00 AM – 4:00 PM

 **Schedule** your appointment:

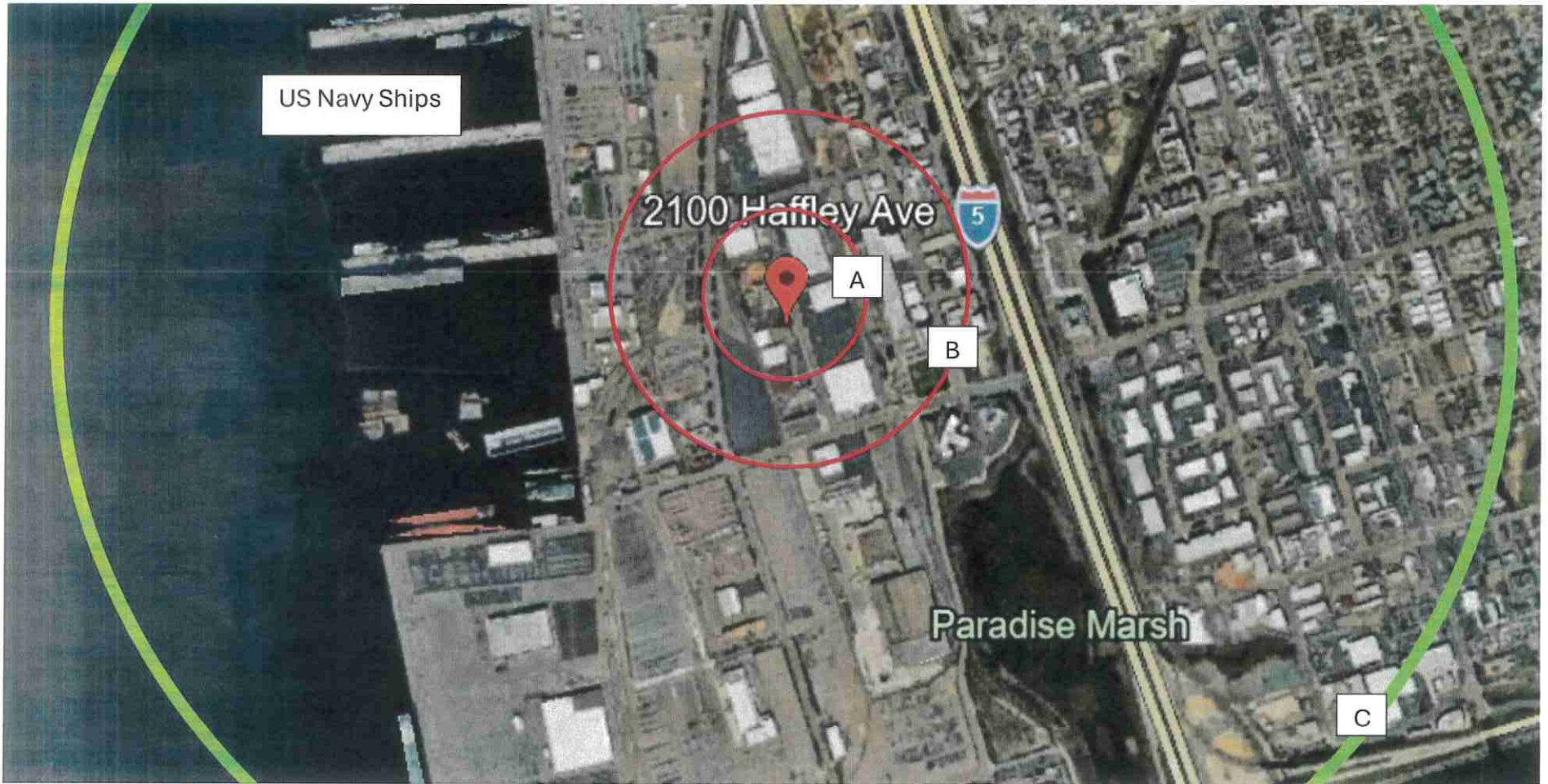
**USE [RedCrossBlood.org](https://www.RedCrossBlood.org)**

**or call Liliana (619) 957-2067**



Donors receive **\$15 Amazon gift card** provided from American Red Cross.

**Walk-Ins Welcome**

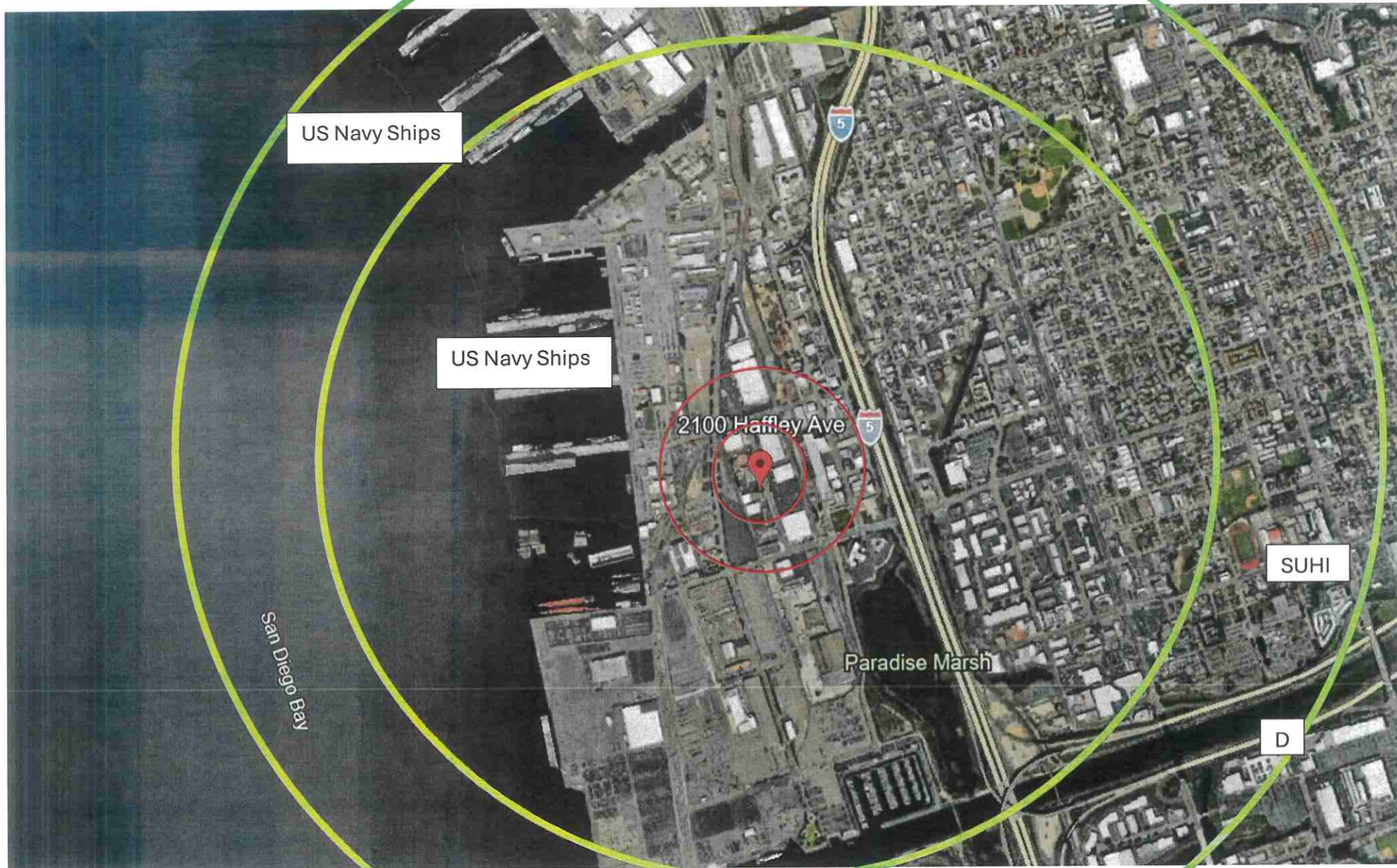


Circle A – 345 ft (FIREBALL RADIUS)

Circle B – 1,378 ft (Emergency Response Distance [the minimum distance response teams have]) & Thermal Radiation Zone – burns exposed skin in 2 seconds

Circle C – 5,167.5 ft (Minimum evacuation zone)

Circle D – 7,218 ft (Preferred evacuation distance) [see page two]



A guidebook intended for use by first responders  
during the initial phase of a transportation incident  
involving hazardous materials/dangerous goods

# 2024

## EMERGENCY RESPONSE GUIDEBOOK



U.S. Department  
of Transportation  
**Pipeline and  
Hazardous Materials  
Safety Administration**



Transport Canada  
Transports Canada



**COMUNICACIONES**  
SECRETARÍA DE INFRAESTRUCTURA, COMUNICACIONES Y TRANSPORTES

## **BLEVE AND HEAT INDUCED TEAR**

### **BLEVE (BOILING LIQUID EXPANDING VAPOR EXPLOSION)**

The following section presents important safety-related information on BLEVEs, including a table, to consider in a situation involving Liquefied Petroleum Gases (LPG), UN1075.

LPGs include the following flammable gases:

- UN1011 - Butane
- UN1012 - Butylene
- UN1055 - Isobutylene
- UN1077 - Propylene
- UN1969 - Isobutane
- UN1978 - Propane

A BLEVE occurs when a fire impinged or damaged tank car fails to contain its internal pressure and explodes with a sudden product release. This catastrophic failure is more likely to occur with damaged pressure tank cars, even in the absence of an active fire.

The **main hazards** from a LPG BLEVE are:

- **Fire:** If the released substance is ignited, there is an immediate fireball.
- **Thermal radiation:** At a distance of about 4 times the radius of a fireball, the heat radiated from a fireball is enough to burn exposed skin in 2 seconds. Wearing protective clothing limits the thermal radiation dose.
- **Blast:** A concussive force caused by the sudden release of the pressurized substance. For a BLEVE occurring out in the open, the blast strength at a distance of 4 times the radius of a fireball can break window glass and may cause minor damage to buildings.
- **Projectiles:** Tank failure can throw metal fragments over large distances. These fragments can and have been deadly.

The danger decreases as you move away from the BLEVE centre. The furthest-reaching hazard is projectiles.

For a video with information on critical safety issues concerning BLEVEs, please visit <https://www.tc.gc.ca/eng/tdg/publications-menu-1238.html>.

### **HEAT INDUCED TEAR (HIT)**

A heat induced tear (HIT) is a rupture of a NON-PRESSURE tank car containing flammable liquids when exposed to the intense heat of a fire. The metal will soften and the pressure in the tank car will increase which can lead to containment failure. The tear generally occurs at the vapor space (upper side) of the container, venting large quantities of flammable liquid and vapors at high speed. A fireball and an intense heat wave will occur.

Compared to BLEVEs, HITs rarely result in the projection of tank car fragments. Heat induced tearing has occurred within 20 minutes of the derailment and as long as 10+ hours following the initial fire.

Responding to these types of incidents (BLEVE and HIT) requires specialized training, equipment and a tactical approach.

## **BLEVE – SAFETY PRECAUTIONS**

**Use with caution.** The following table gives a summary of tank properties, critical times, critical distances and cooling water flow rates for various tank sizes. This table is provided to give responders some guidance but it should be used with caution.

**Tank dimensions are approximate** and can vary depending on the tank design and application.

**Minimum time to failure** is based on *severe torch fire impingement* on the vapor space of a tank in good condition, and is approximate. Tanks may fail earlier if they are damaged or corroded. Tanks may fail minutes or hours later than these minimum times depending on the conditions. It has been assumed here that the tanks are not equipped with thermal barriers or water spray cooling.

**Minimum time to empty** is based on an engulfing fire with a properly sized pressure relief valve. If the tank is only partially engulfed, then time to empty will increase (i.e., if tank is 50% engulfed, then the tanks will take twice as long to empty). Once again, it has been assumed that the tank is not equipped with a thermal barrier or water spray.

**Tanks equipped with thermal barriers or water spray cooling** significantly increase the times to failure and the times to empty. A thermal barrier can reduce the heat input to a tank by a factor of ten or more. This means it could take ten times as long to empty the tank through the Pressure Relief Valve (PRV).

**Fireball radius and emergency response distance** is based on mathematical equations and is approximate. They assume spherical fireballs and this is not always the case.

**Two safety distances for public evacuation.** The minimum distance is based on tanks that are launched with a small elevation angle (i.e., a few degrees above horizontal). This is most common for horizontal cylinders. The preferred evacuation distance has more margin of safety since it assumes the tanks are launched at a 45 degree angle to the horizontal. This might be more appropriate if a vertical cylinder is involved.

It is understood that these distances are very large and may not be practical in a highly populated area. However, it should be understood that the risks increase rapidly the closer you are to a BLEVE. Keep in mind that the furthest reaching projectiles tend to come off in the zones 45 degrees on each side of the tank ends.

**Water flow rate is based on  $5 (\sqrt{\text{capacity (USgal)}}) = \text{USgal/min}$  needed to cool tank metal.**

**Warning:** the data given are approximate and should only be used with extreme caution. For example, where times are given for tank failure or tank emptying through the pressure relief valve – these times are typical but they can vary from situation to situation. Therefore, never risk life based on these times.

**WARNING:**

The data given are approximate and should only be used with extreme caution. These times can vary from situation to situation. LPG tanks have been known to BLEVE within minutes. Therefore, never risk life based on these times.

**BLEVE  
(USE WITH CAUTION)**

Capacity		Diameter		Length		Propane Mass	Minimum time to failure for severe torch	Approximate time to empty for engulfing fire	Fireball radius	Emergency response distance	Minimum evacuation distance	Preferred evacuation distance	Cooling water flow rate	
Litres (Gallons)	Meters (Feet)	Meters (Feet)	Meters (Feet)	Kilograms (Pounds)	Minutes	Minutes	Meters (Feet)	Meters (Feet)	Meters (Feet)	Meters (Feet)	Meters (Feet)	Litres/min	USgal/min	
100 (26.4)	0.3 (1)	1.5 (4.9)	40 (88)	4	8	10 (33)	90 (295)	154 (505)	307 (1007)	97	26			
400 (106)	0.61 (2)	1.5 (4.9)	160 (353)	4	12	16 (52)	90 (295)	244 (801)	488 (1601)	195	52			
2000 (528)	0.96 (3.1)	3 (9.8)	800 (1764)	5	18	28 (92)	111 (364)	417 (1368)	834 (2736)	435	115			
4000 (1057)	1 (3.3)	4.9 (16.1)	1600 (3527)	5	20	35 (115)	140 (459)	525 (1722)	1050 (3445)	615	163			
8000 (2113)	1.25 (4.1)	6.5 (21.3)	3200 (7055)	6	22	44 (144)	176 (577)	661 (2169)	1323 (4341)	870	230			
22000 (5812)	2.1 (6.9)	6.7 (22)	8800 (19401)	7	28	62 (203)	247 (810)	926 (3038)	1852 (6076)	1443	381			
42000 (11095)	2.1 (6.9)	11.8 (38.7)	16800 (37038)	7	32	77 (253)	306 (1004)	1149 (3770)	2200 (7218)	1994	527			
82000 (21662)	2.75 (9)	13.7 (45)	32800 (72312)	8	40	96 (315)	383 (1257)	1435 (4708)	2200 (7218)	2786	736			
140000 (36984)	3.3 (10.8)	17.2 (56.4)	56000 (123459)	9	45	114 (374)	457 (1499)	1715 (5627)	2200 (7218)	3640	962			