

“STATE-OF-THE-ART”



Cumberland

F A R M S

# Quasi-Jucial Proceeding/Competent and Substantial Evidence

- Subject Matter Expert testimony:

- Land Use/Code Compliance

- Mel Scott, AICP (since 1997) – land use compatibility/Comp. Plan & Zoning Code compliance/consistency

- Traffic Safety/FDOT Compliance

- Shaun MacKenzie, P.E. (since 2001) – Seaway Drive level-of-service (LOS) acceptability and traffic flow/design per FDOT standards

- Environmental Protections/Innovations

- William E. Baird, P.E., LSP (since 1965) – environmental protections meeting and/or exceeding State and Federal standards for underground petroleum storage

- Engineer of Record

- Jeff Lucas, P.E., (since 2010) – site layout and code compliance

# Cumberland Farms Request to Mayor/Commission

- Approval of “State-of-the-Art” Convenience Store w/ *fueling island*
- *1,675 sq. ft.* of additional retail space.



# Harbor Isle at Hutchinson Island History

- August 5, 2004, City Commission granted approval of the “planned development” *Harbor Isle*.
- Multi-family and commercial uses were approved.
- Commercial uses were approved along Seaway Drive (i.e., subject parcel) to ensure resident convenience and predictability of future build-out.
- Initially planned for a 33,000 s.f. retail center and later reduced to a 15,000 s.f. retail center.

# Tenants of “Planned Development”

- Community Planning – Right uses/right locations
- Architecture/Aesthetics
- Landscaping
- Lighting/Security
- Traffic Circulation
- Environmental Protections

## Site Design; Listening - Responding

- Underground Storage tanks shifted away from adjacent residential.
- All deliveries will occur in “front of house”, never from the rear.
- Increased landscaping along existing privacy wall to achieve 100% opaque condition from all commercial activity at rear property line.
- Color scheme/architecture consistent with Harbor Cay shops and Harbor Isle (Benjamin Moore paint).

# Site Design; Listening - Responding

- Additional investment in security cameras around perimeter
- (3) Storm-Ceptor devices to capture runoff particulates before entering into master storm system (key innovation exceeds Code)
- Site lighting achieves 0 foot-candles at property line (slide 14 will illustrate)





# Eastern Entrance



835 Seaway Dr  
Fort Pierce FL

FOR INFORMATIONAL AND ILLUSTRATION PURPOSES ONLY. ALL PRODUCT, SERVICE AND CORPORATE NAMES ARE THE PROPERTY OF THEIR RESPECTIVE OWNERS. THESE IMAGES ARE NOT INTENDED FOR ENGINEERING PURPOSES. RED LEONARD ASSOCIATES IS NOT RESPONSIBLE FOR ANY DIMENSIONS LISTED ON THE ILLUSTRATIONS PROVIDED.

RLAtechnology.com  
813-574-9500

**RLA TECHNOLOGY**  
SOLUTIONS

# Western Entrance



835 Seaway Dr  
Fort Pierce FL

FOR INFORMATIONAL AND ILLUSTRATION PURPOSES ONLY. ALL PRODUCT, SERVICE AND CORPORATE NAMES ARE THE PROPERTY OF THEIR RESPECTIVE OWNERS. THESE IMAGES ARE NOT INTENDED FOR ENGINEERING PURPOSES. RED LEONARD ASSOCIATES IS NOT RESPONSIBLE FOR ANY DIMENSIONS LISTED ON THE ILLUSTRATIONS PROVIDED.

RLAtechnology.com  
813-574-9500

**RLA TECHNOLOGY**  
SOLUTIONS



**EXAMPLES OF  
ALUMINUM ROOFTOP  
SCREENING LOUVERS**

North View Harbor  
Isle pkg lot & CF rear

ARE THE PROPERTY OF THEIR RESPECTIVE OWNERS. THESE IMAGES  
ARE FOR ANY DIMENSIONS LISTED ON THE ILLUSTRATIONS PROVIDED

RLAtechnology.com  
913-574-9500

**RLA TECHNOLOGY  
SOLUTIONS**

2<sup>nd</sup> FL looking north



835 Seaway Dr  
Fort Pierce FL

FOR INFORMATIONAL AND ILLUSTRATION PURPOSES ONLY. ALL PRODUCT, SERVICE AND CORPORATE NAMES ARE THE PROPERTY OF THEIR RESPECTIVE OWNERS. THESE IMAGES ARE NOT INTENDED FOR ENGINEERING PURPOSES. RED LEONARD ASSOCIATES IS NOT RESPONSIBLE FOR ANY DIMENSIONS LISTED ON THE ILLUSTRATIONS PROVIDED

RLAtechnology.com  
513-574-9500

**RLA TECHNOLOGY**  
SOLUTIONS



3<sup>rd</sup> FL looking north

835 Seaway Dr  
Fort Pierce FL

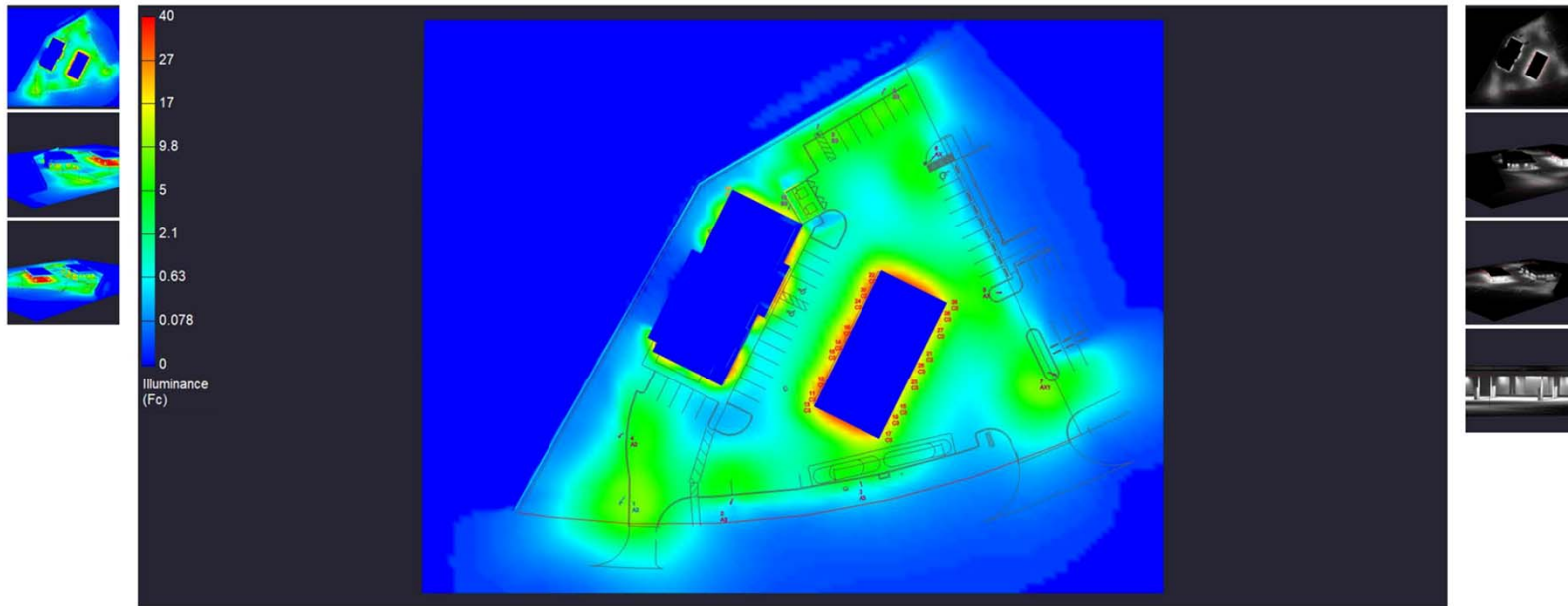
FOR INFORMATIONAL AND ILLUSTRATION PURPOSES ONLY. ALL PRODUCT, SERVICE AND CORPORATE NAMES ARE THE PROPERTY OF THEIR RESPECTIVE OWNERS. THESE IMAGES ARE NOT INTENDED FOR ENGINEERING PURPOSES. RED LEONARD ASSOCIATES IS NOT RESPONSIBLE FOR ANY DIMENSIONS LISTED ON THE ILLUSTRATIONS PROVIDED.

RLAtechnology.com  
513-574-9500

RLA TECHNOLOGY  
SOLUTIONS

# INTERACTIVE SITE LIGHTING

**ILLUMINATION MAPPING**  
PSEUDO COLOR LIGHTING STUDY AND SLIDESHOW



ROLL CURSOR OVER IMAGES ON LEFT AND RIGHT TO VIEW LARGER



**UNDERSTAND YOUR LIGHTING SOLUTION**  
CLICK TO VIEW AN INTERACTIVE PHOTOMETRY COMPARISON

PHOTOMETRIC COMPARISON TOOL  
LIGHTING DISTRIBUTION TOOL  
IP RATINGS EXPLAINED



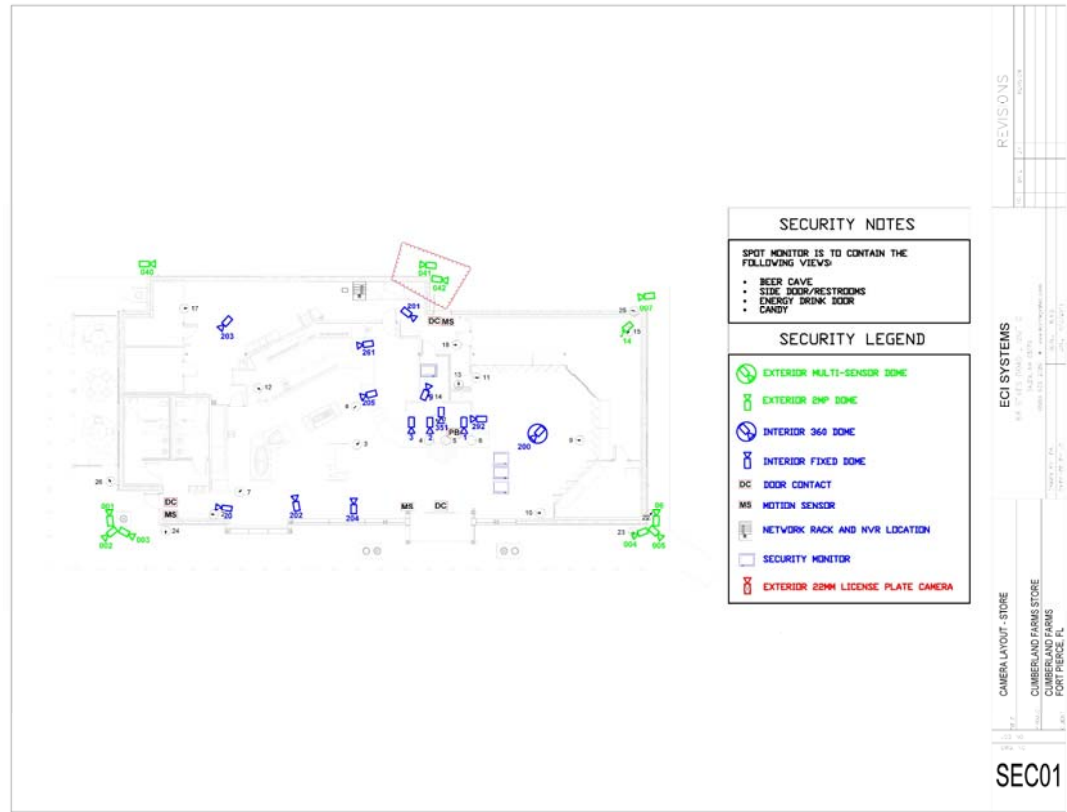
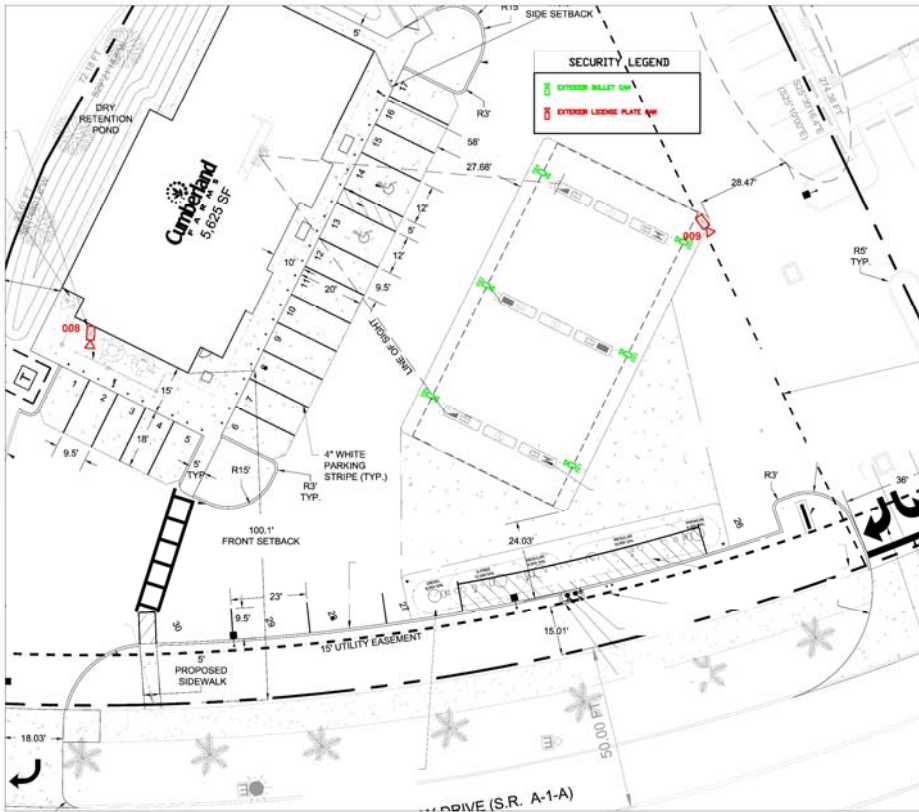
Adobe Acrobat  
Document



For informational and illustrative purposes only. All product, service and corporate names are the property of their respective owners. Product specifications and quantities may vary. These documents are the property of Reed Larson Associates, Inc. Any use of these documents without the written consent of Jeremy J. Larson of Reed Larson Associates, Inc. is strictly prohibited.

**RL-5964-S1-R5**  
PAGE 4 OF 5

# SECURITY CAMERA LAYOUT



REVISIONS	

ECI SYSTEMS	

CAMERA LAYOUT - STORE	

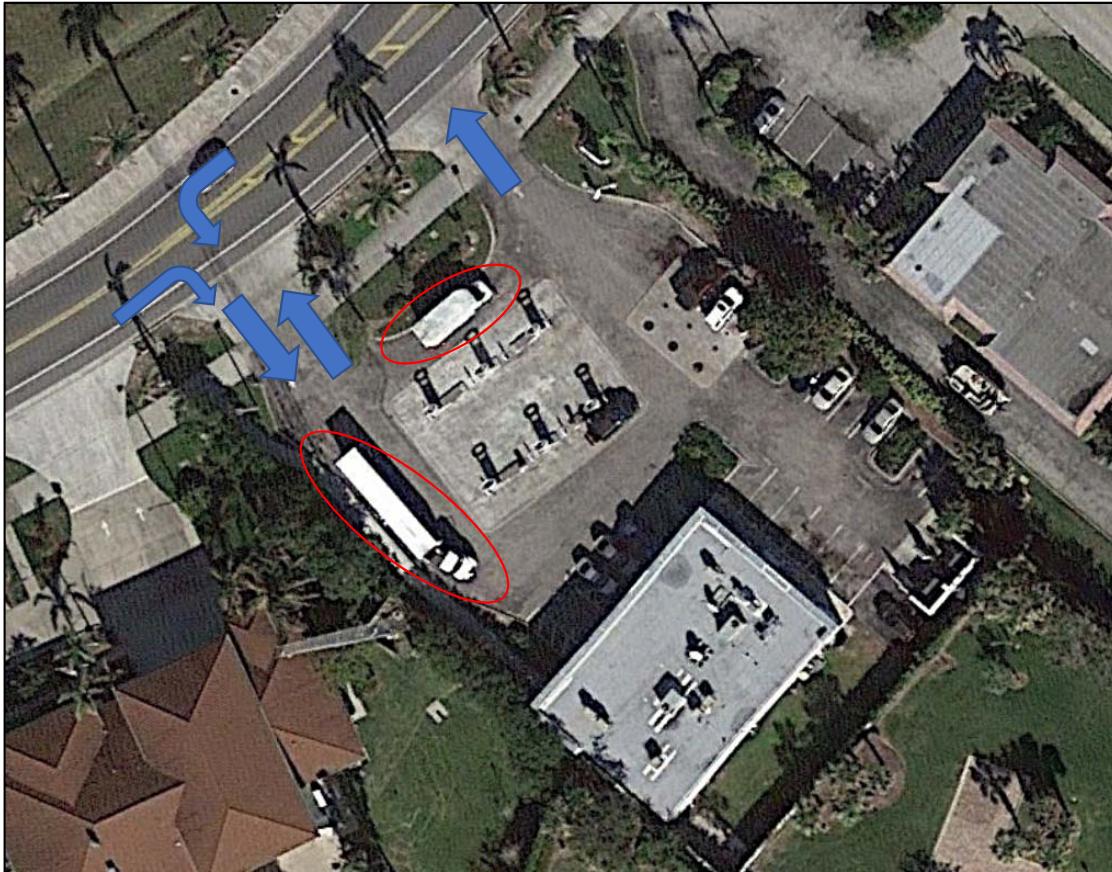
CUMBERLAND FARMS STORE	

PORT PEARCE, WA	

SEC01

# TRAFFIC - EXISTING SITE



- One Outbound Driveway
- One Inbound and Outbound Driveway
- Tight Circulation
  - 1 x 12' inbound lane
  - 12' between Pumps Parking & Store Parking
  - 13' between Pump parking and exit Island
  - 21 parking stalls
  - 12 vehicle fueling positions

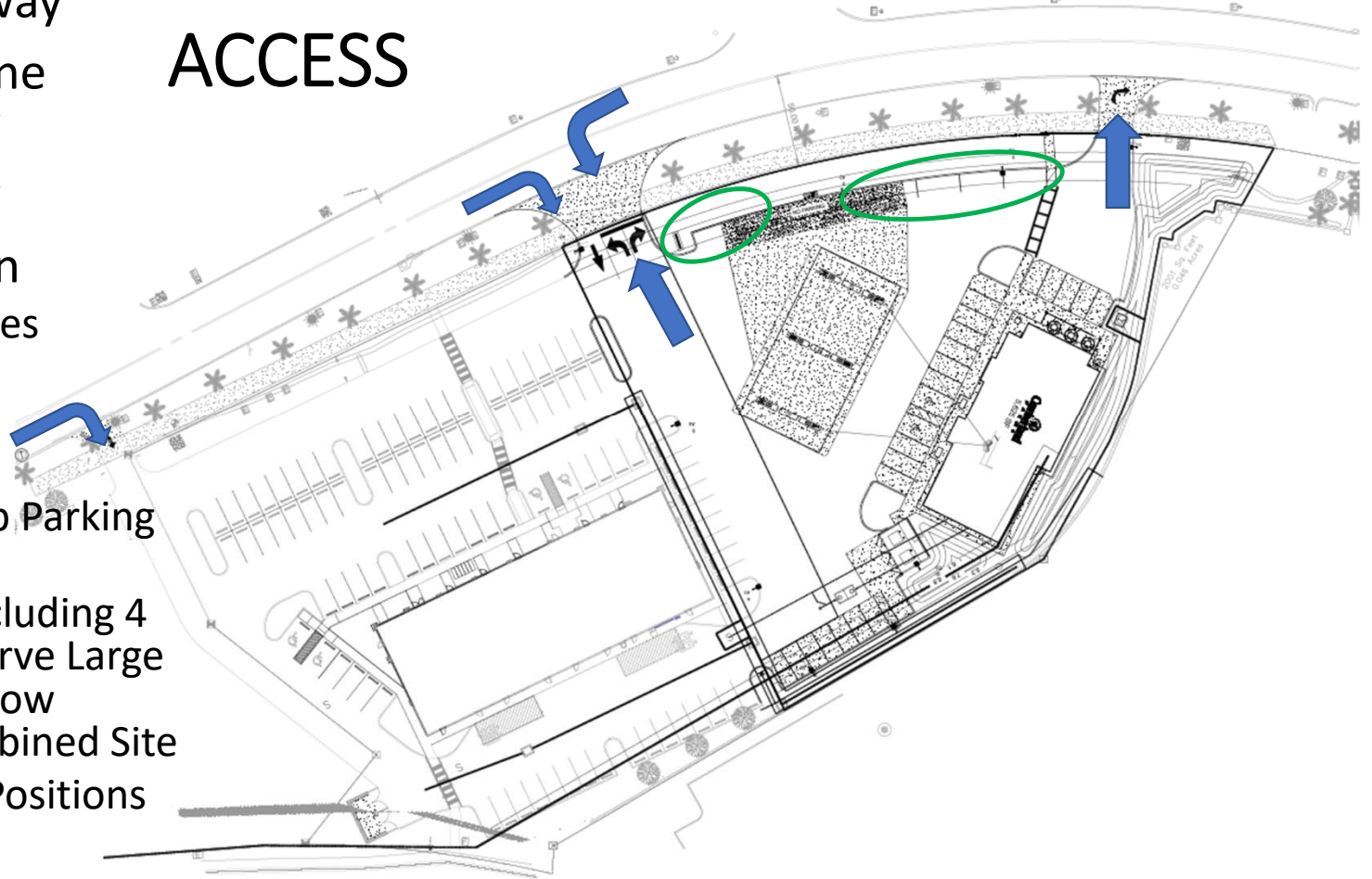
# EXISTING SITE CONSTRAINTS



- Onsite Circulation is constrained and impacting A1A
- Large vehicles have difficulty parking at circulating at the existing site
- 2 Pump Islands

# IMPROVED SITE CIRCULATION AND ACCESS

- One Inbound Driveway
- One Inbound and One Outbound Driveway
- Outbound Driveway
- Improved Circulation
  - 2 x 12' Inbound Lanes
  - 30±' between Pump Parking & Store Parking
  - 28±' between Pump Parking and Exit Island
  - 30 Parking Stalls Including 4 Parallel Spaces – Serve Large Vehicles Plus Overflow Parking within Combined Site
  - 12 Vehicle Fueling Positions
  - 3 Pump Islands



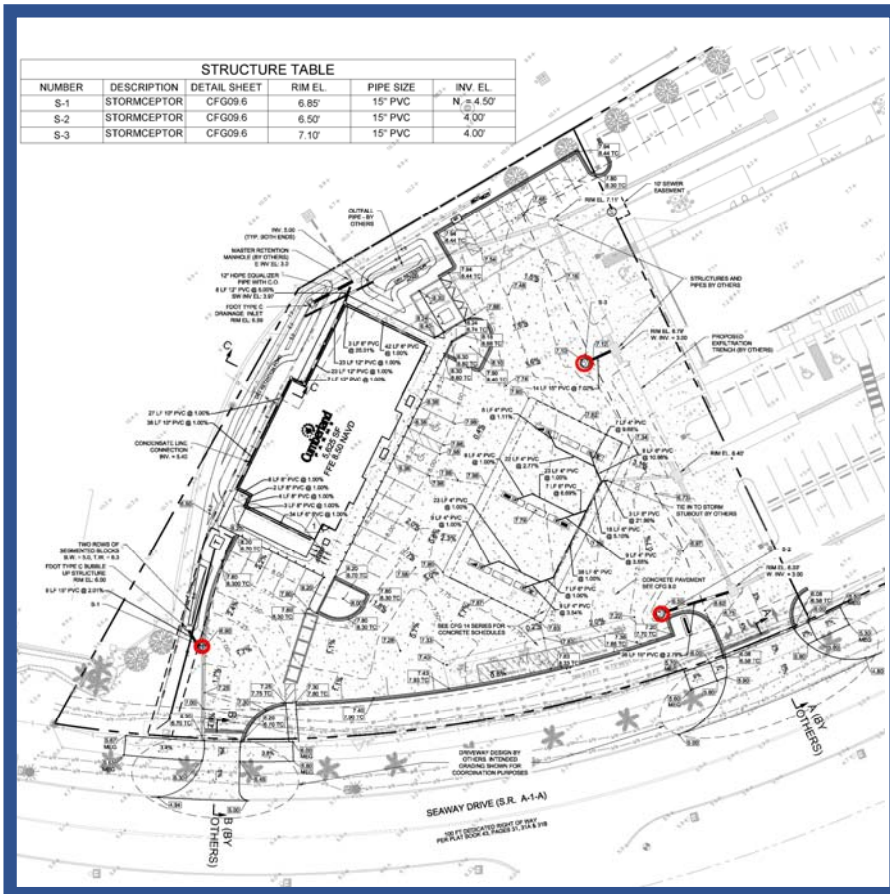
# TRAFFIC FLOW

- New Site Provides More and Better Access
- Move Cars Off A1A Faster and on to Site
- FDOT Approved Access as Shown
- St Lucie County Fire District Approve Site and Access – “The St Lucie County Fire District has no issues and the site meets the access requirements” – Captain Paul Langel

# TRAFFIC CONCURRENCY

- MEETS ADOPTED LEVEL OF SERVICE STANDARD
- Westbound Left-turn LOS
  - AM Peak Hour – 8.6 Seconds – LOS A
  - PM Peak Hour – 9.2 Seconds – LOS A
- Traffic Study Includes Impact of Existing Cumberland Farms Store
- Closure of Existing Store – 661 Daily Trip Reduction on A1A

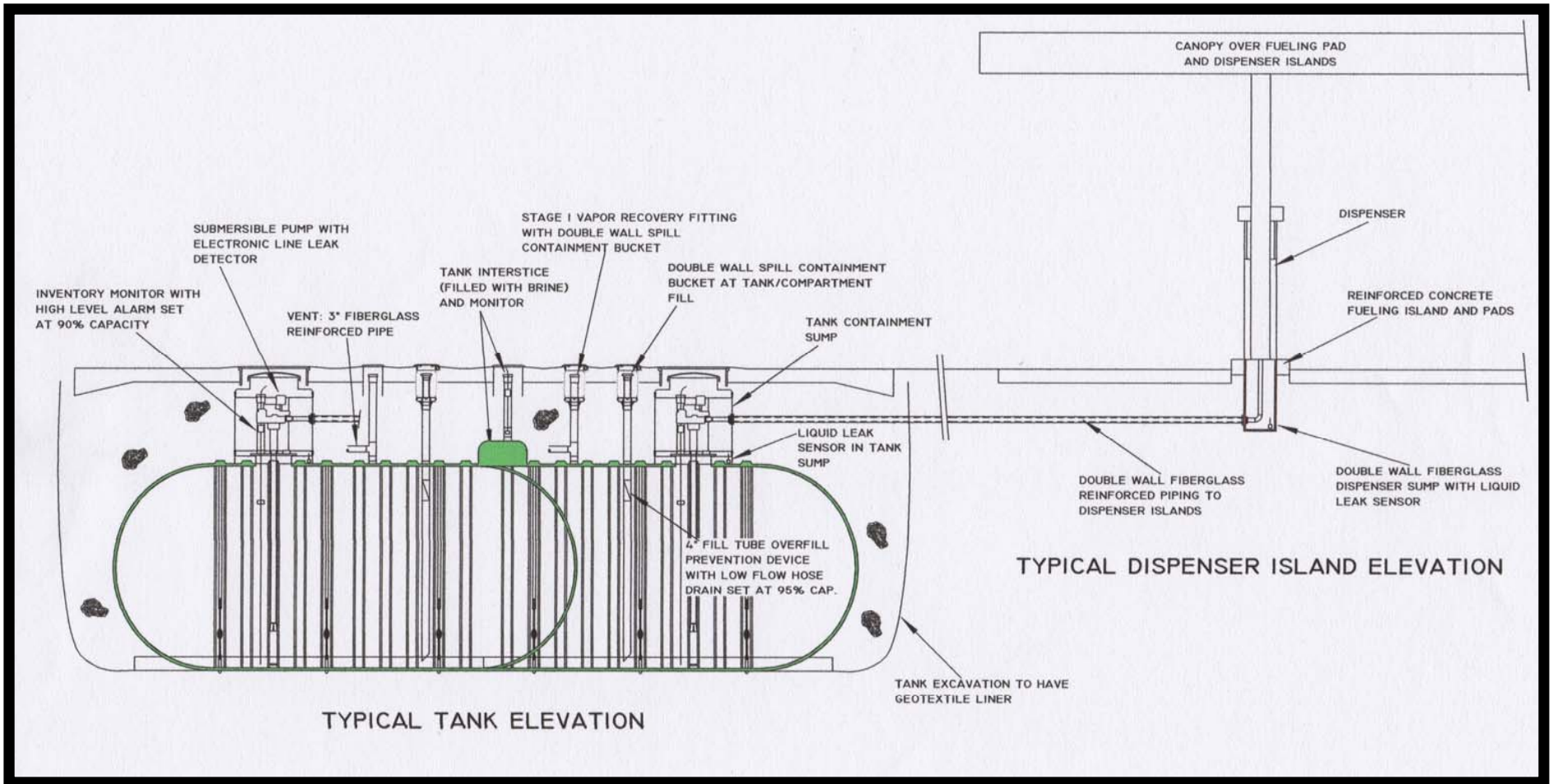
# Protecting the Environment



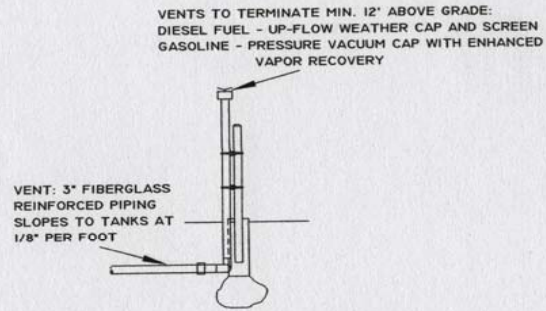
- The site plan shows 3 Stormceptors.
- All surface waters will drain to a Stormceptor.
- Stormceptors remove sediments and oils from stormwater.
- Stormceptors were first approved by the New Jersey Corporation of Advanced Technology in 2004.
- Stormceptors were recently recertified by the Department Environmental Engineering and Sciences at the University of Florida, Gainesville in 2008



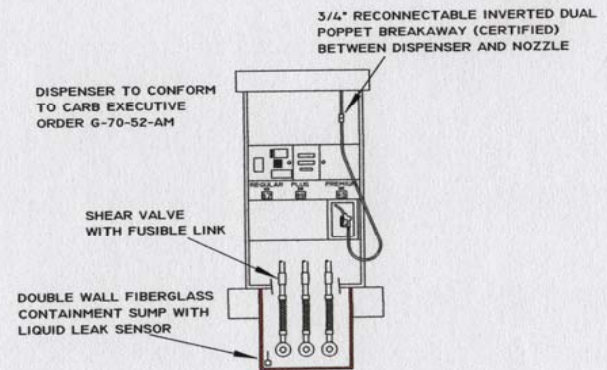
# Protecting the environment



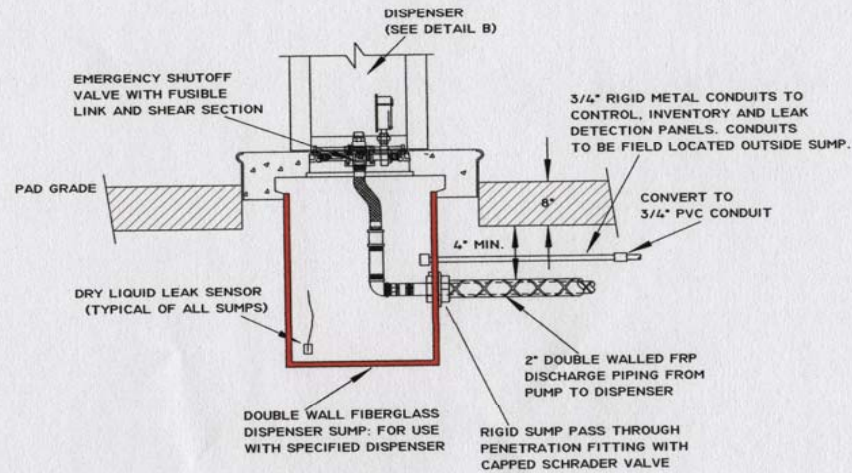
# Protecting the Environment



VENT SUPPORT AND TERMINATION



TYPICAL DISPENSER DETAILS



TYPICAL DISPENSER SUMP

# Summary Facts for Approval

- Planning Staff recommendation – APPROVAL
- Planning Board recommendation – Unanimous APPROVAL
- Elimination of “old” store with “State-of-the-Art” Facility
- 15 years ago – HIMU/PD anticipated commercial use at 835 Seaway Dr.
- Infill development preserving community asset for convenience goods.



**WEB ENGINEERING ASSOCIATES, INC.**

111 Summer Street

P.O. Box 710

North Scituate, Massachusetts 02060

TEL: 781-546-2161 • FAX: 781-378-2192

July 1, 2019

Fort Pierce Planning Board  
100 N. U.S. Highway 1  
P.O. Box 1480  
Fort Pierce, FL 34954

Dear Members of the Fort Pierce Planning Board

The following is a Third Party Evaluation of the Proposed New Petroleum Storage, Fuel Dispensing and Environmental Protection for Cumberland Farms, Inc. at 801 Seaway Drive, Ft. Pierce, FL

This evaluation is prepared by Web Engineering Associates, Inc., Scituate, MA., William E. Baird, PE, LSP.

Existing Facility: Cumberland Farms currently operates a convenience store with gasoline at 975 Seaway Drive. The existing fuel storage and dispensing at 975 Seaway Drive consists of 3-8,000-gallon double wall steel tanks installed in 1995. The underground piping is double wall flexible piping with mechanical leak detection. There are two dispenser islands with 6 dispensers dispensing gasoline.

Proposed new facility: Cumberland Farms proposes to operate a new convenience store at 801 Seaway Drive with fuel dispensing. The fuel will be stored in double wall fiberglass reinforced plastic (FRP) tanks. The underground piping will be double wall FRP piping. There will be 3 dispenser islands with 6 dispensers. The fuels dispensed will be regular and premium gasoline, ethanol free gasoline and diesel fuel.

The entire facility will be "state of the art" for petroleum storage, meeting or exceeding state and federal regulations for underground petroleum storage.

This report is divided into 4 Sections: (1) Environmental Protection, (2) Operations and (3) Environmental issues related to the storage of gasoline. (4) Comments Regarding the "Initial Strategy Analysis-Harbour Isle Preservation & Cumberland Farms."

**(1) Environmental Protection:**

Tanks: The proposed new tanks are 24,000 gallons each. The tank storing ethanol free gasoline has three compartments; 1-6,000-gallon diesel, 1-6,000 gallon regular gasoline and 1-12,000 gallon ethanol free gasoline. The tank storing 18,000 gallons of regular gasoline also has a 6,000-gallon premium gasoline compartment. The compartments are separated by a fiberglass reinforced plastic bulkhead. The 6,000-gallon gasoline compartment is connected to the 18,000 gallon gasoline compartment by a pipe that creates a siphon, so the two regular gasoline compartments in the two tanks act as one tank.

The primary tank and the secondary tank are constructed of fiberglass reinforced plastic (FRP). FRP tanks and FRP piping contain glass fiber reinforcement embedded in cured thermosetting resin. Thermosetting plastics are resins that undergo an irreversible reaction when cured in the presence of a catalyst. Cured thermosetting resins cannot be re-melted and are insoluble to petroleum products; blends of gasoline and diesel fuels. FRP tanks and piping do not corrode in a soils environment.

The steel tanks at 975 Seaway are steel and subject to internal and external corrosion.

FRP tanks and piping meet the standards of the following organizations:

API American Petroleum Institute  
ASME American Society of Mechanical Engineers  
ASTM American Society for Testing and Materials  
AWWA American Water Works Association  
FM Factory Mutual Research  
NSF National Sanitation Foundation  
UL Underwriters Laboratories, Inc.

The FRP tanks are double wall. The space between the walls, the interstice, is filled with brine. Brine is filled into the interstice and into a containment area located on the top of the tank. The brine is a calcium chloride solution. The containment area at the top of the tank has a liquid level sensor. Should the primary tanks containing gasoline or diesel fuel fail, the brine will leak into the primary tank and the liquid level sensor will activate an alarm. An inventory gauge located in the product also has a liquid sensor. Therefore, there is redundancy in sensing a leak in the primary tank. There will be no release to the environment. Should the external tank, the secondary containment, leak, the brine will leak into the area surrounding the tank and the level sensor will sound an alarm. The brine is a non toxic colored water solution. The sensor is continuously monitored and should the sensor fail to provide a signal, an audio/visual alarm is activated.

The steel tanks at 975 Seaway have a dry interstice. Should the secondary containment fail above the groundwater or above the normal high level of the storage of the gasoline, the failure of the secondary containment will not be detected.

I have consulted the Fiberglass Tank Institute, a nonprofit manufacturers association dedicated to the advancement of FRP products, and other journal sources and found no reports of a release of product from double wall fiberglass tanks, of which there are more than 200,000 in service.

Piping: The underground piping is secondarily contained FRP pipe. The primary pipe contains gasoline or diesel fuel. In the event of a failure in the primary pipe, the interstice between the two pipes, conducts the product to a containment sump. The containment sump has sensors located near the bottom of the sump. All underground piping is sloped to a containment sump, so any release of product flows quickly to the containment sump. Activation of a sump sensor creates an audible/visual alarm and the system is immediately shut down.

The underground piping at 975 Seaway has flexible piping. Flexible piping is subject to failure from reactions with certain gasolines or diesel fuels. Flexible piping does not have the ability to carry product leaking from primary containment to a containment sump except under pressure. Small leaks may go undetected for long periods of time.

The underground piping from the tank to the dispenser islands is pressurized by pumps located at the top of the tank in an FRP containment sump. One pump services one product except for the regular gasoline that requires 2 pumps to supply the 6 dispensers. The piping at the pump is equipped with a Veeder-Root Pressurized Line Leak Detector (PLLD). This equipment is "state of the art" for detecting leaks in product piping. Should a leak occur in the pressurized piping an audio/visual alarm is activated and the transfer of product is terminated. Thus, there are redundant systems to detect primary piping leaks and the interstice of the double wall piping conveys product to a containment area such that a release to the environment as a result of a piping leak will not occur.

The pressure piping at 975 Seaway Drive has a mechanical leak detection device. This device only works when the pumps are not working. It senses a leak by the pressure drop in the leaking pipe. The mechanical leak detection device does not sound an alarm. A leak is detected by the partial closure of the valve slowing down the rate of flow to vehicles as the vehicles are filled.

The fill pipes to the regular and ethanol free gasoline tanks are located above the tanks. Each fill pipe has a 5 gallon spill containment sump around the top of the pipe where the tank is filled. The containment sump is designed to catch any drops that may discharge from a nozzle as a hose is disconnected from the fill pipe. The containment sump is double wall cast iron and steel. The double wall containment sump has a connection to test the integrity of the secondary containment. The bottom of the sump connects to steel piping that connects directly to the tank. Inside the steel pipe is an aluminum fill tube. The top of the tube is sealed such that the fill piping is secondarily contained.

The aluminum fill tube is equipped with a float valve. The float valve stops the flow of product into the tank when the level of product in the tank reaches 95% of the capacity of the tank.

The diesel compartment and the premium gasoline compartments have "remote fills." There are spill buckets located between the two double wall tanks. The spill buckets are also double wall. 4 inch diameter double wall FRP pipe carries the diesel fuel and the premium gasoline to their respective compartments. These double wall pipes terminate in containment sumps with leak sensors prior to entering the tanks fill pipe. The remote fills to the diesel and premium gasoline are located so the transport truck will not have to move to deliver product to the tanks.

Also located on top of the gasoline containing compartments is a vapor return pipe. The vapor return pipe also is equipped with a 5 gallon double wall spill containment sump. The spill containment sump will collect any condensate that may occur in the vapor return hose preventing the condensate from entering the subsurface environment.

All hose connections at the tank tops comply with the California Air Resources Board requirements for control of vapor emissions.

The tanks and the piping are installed by qualified contractors. The contractors must be certified by the tank and the piping manufacturers. The Petroleum Equipment Institute and the American Petroleum Institute, as well as the manufacturers, provide recommended practices for the installation of tanks and piping.

Containment Sumps: Containment sumps are constructed of FRP. FRP does not corrode or deteriorate when exposed to the products or to soils. Containment sumps are located under each dispenser with liquid sensors located near the bottom of the sump. Should product leak inside the dispenser, the sump sensor will activate the audio/visual alarm. The dispenser containment sumps are double wall.

The containment sump under each dispenser has a volume of approximately 23 gallons. The containment sump at the top of the tank that has the pump, piping connections and the inventory gage will hold approximately 180 gallons of product.

Dispensers: At the top of the dispenser sump, inside the protection of the concrete mat surrounding the dispenser there is a valve on the product piping. The valve is called a "shear valve" or an "emergency shear valve." The purpose of the valve is safety. Should the dispenser be displaced in an accident, the emergency shear valve closes and prevents an uncontrolled release of gasoline. Cumberland Farms installs double poppet shear valves. The double poppet prevents gasoline in the dispenser and the piping supplying the dispenser from escaping in the event of an accident involving a dispenser.

The hose on the dispenser contains a breakaway coupling (dry-break connection). Should a driver leave the area with the hose nozzle still in the vehicle fill pipe, the dry-break will sever. Mechanisms inside the dry-break prevent the release of little more than a few drops of product.

The nozzle that is placed in the vehicle fill pipe has a self-closing valve. The valve closes automatically as product fills the fill tube. Should the automatic valve fail, the operator would release the lever on the valve and much less than a gallon of product would be released. (The vehicle tank fills with product at less than 10 gallons per minute. If it takes two seconds for an operator to react, the amount released will be about 1/3 of a gallon.

Inventory and Sensor Control: The product inventory is measured by a Veeder-Root Automatic Tank Gauge (ATG). Veeder-Root is the worlds' leading tank gauge supplier. In each tank, there is a float mechanism that senses the level of the product. The ATG converts the level of the product into gallons. Cumberland Farms employs a version of the ATG that provides many functions. The ATG not only provides the tank inventory, but also conducts continuous product leak detection on the tank inventory. The ATG also continuously monitors all the sump sensors and the product line leak detectors. The ATG sends an electronic signal to each sensor. If the signal is not returned, the alarm is activated. Thus, all the sensors, the line leak detector, the tank interstice sensor and the inventory in the tank are continuously monitored. The ATG also has a high product level sensor. Should the product in the tank reach 95% of the capacity of the tank, an audio/visual alarm is activated.

The USEPA requires third party certification of all leak detection systems. The Veeder-Root System meets or exceeds all federal requirements.

**Air Emissions Control:** The tank venting system is configured for vapor recovery and the control of emissions from the gasoline tanks. The vent on the venting system has a pressure vacuum valve. This valve controls the release of gasoline vapors to the atmosphere. During the filling of the tanks, the vapor and air in the tanks is exchanged with the product in the tanker truck.

The pressure vacuum vents installed on the gasoline tank vents limit the emissions from the tanks to 0.17 Standard Cubic Feet per Hour. 0.17 Standard Cubic Feet equals the 293 cubic inches about the size of a professional football. Gasoline is not continuously emitted from the tank vents. As the gasoline tanks are emptied by filling vehicles, a slight vacuum is placed on the tanks. Air is therefore sucked into the tanks and no emission of gasoline vapors occurs. The system is required to be field tested every three years for compliance with regulations.

Cumberland Farms is required to report the amount of gasoline dispensed from the station to the USEPA.

The gasoline delivery and tank venting system meet the National Emission Standards for Hazardous Air Pollutants (NESHAPS) with the Maximum Achievable Control Technology (MACT).

**Tank Flotation:** The tanks are anchored to concrete structures placed below the tanks with "straps" supplied by the tank manufacturer. The straps are placed over the tops of the tanks and anchor the tanks to the concrete structures. In the event of a high-water table, the anchoring prevents empty tanks from floating.

The tanks and piping are bedded in specifically sized stone. The stone provides structure to the tanks and protects the tanks and piping from any sharp objects that may be in the native soil. The excavation is lined with a geotextile fabric. The geotextile fabric prevents native soils from migrating into the stone placed under and around the tanks. Inside the tank excavation are "observation wells." The wells extend below the bottom of the tanks. The wells are required by regulation. The stone surrounding the tanks is much more permeable than native soils. Should a release occur from the secondary of the tanks or piping, product would flow to the tank excavation. The observation wells provide a convenient method to determine if product has been released to the environment.

**Spill Control:**

**Fuel Deliveries:** Fuels are delivered in transport trucks. Before fuel is scheduled to be delivered to a location, the CFI dispatcher knows the volume in the underground storage tanks. This is done electronically through the ATG system. This procedure ensures that the tanks will not be overfilled. When the

truck enters the site to make a delivery, the driver is required to manually determine that the tanks will hold the product. The driver opens the cover of the spill containment sump and removes the cap on the fill pipe. The driver inserts a calibrated wooden stick (pole or rod) into the tank, withdraws the stick and reads the elevation of the product in the tank. He then checks the level of the product against a calibrated tank chart. The chart indicates the amount of product in the tank. The driver then knows if the tank will hold the product that is in the truck. "Sticking the tank" is a check against the Automatic Tank Gauge and the Dispatcher.

Once the driver has determined the tank will hold the product, the driver removes two hoses from a shelf on the truck and connects one hose to the tank fill pipe and to the product manifold on the truck. The second hose is for vapor recovery. This hose attaches to the Stage One Vapor Recovery Piping at the tank and a special fitting on the truck. The two hoses are for gasoline only. As gasoline product fills the underground tank, the truck empties. This procedure creates a slight vacuum in the truck tank such that gasoline vapors in the underground tank are transferred to the truck tank.

Diesel fuel has one hose to fill the tank. Diesel fuel does not have vapors such that vapor return is required.

When the hoses are safely connected to the tank piping and the tanker truck piping, the safety valves on the truck are opened and product flows from the truck to the tank.

As product begins to flow, the driver checks for leaks. If a leak occurs, the driver shuts the valves on the truck manifold and makes a repair. Any gasoline that has dripped on any surface is carefully removed with absorbent pads. The driver is required to remain by the truck manifold as long as the hoses are connected to the truck and the underground storage tank. Absorbent pads contaminated with gasoline or diesel fuel are safely stored on site and removed in accordance with Florida DEP regulations.

Generally, product flows through the hose at less than 500 gallons per minute. Should a hose fail, it will take the driver less than 4 seconds to close the tank truck valves. The release will be less than 40 gallons.

Should a tanker truck hose failure occur, the Fire Department is notified immediately and the Cumberland Farms dispatcher is notified. A Hazmat company is called to remove the spill from any containment structure.

When the truck tank is empty, the driver closes the valve at the truck manifold and disconnects the hose from the truck manifold. The hose is "rolled" toward the tank such that any product in the hose drains into the tank.

When the driver is certain there is no product in the hose, he disconnects and the hose from the tank and places caps on the hose and the tank fill pipe. Any product dripping from the hose during this operation is captured in the 5-gallon spill containment sump.

Stormwater from the area of the tanks and the fuel dispensing is directed to three Stormceptor surface drainage catch basins. The Stormceptor is a prefabricated underground structure designed to remove sediments and oil and grease from stormwater. Stormceptors are installed based upon the storm flow rates for a specific surface area. The smallest Stormceptor has an oil retention capacity of 86 gallons.

The proposed Stormceptor is approved by NJCAT (New Jersey Corporation of Advanced Technology). The Stormceptor was originally tested in 2004 at the NJCAT facility in Bordentown, NJ and recertified by the Department of Environmental Engineering Sciences at the University of Florida, Gainesville in 2008.

The gasoline delivery and tank venting system meet California Air Resources Board (CARB) Standards for Enhanced Vapor Recovery (EVR), the National Emission Standards for Hazardous Air Pollutants (NESHAPS), and Maximum Achievable Control Technology (MACT). Based on the vapor pressure of diesel fuel, diesel tanks do not have vapor recovery.

New vehicles with carbon canisters emit very little gasoline per fill up. Onboard Refueling Vapor Recovery (ORVR) systems, dramatically limit refueling emissions. The EPA implementation of ORVR rules has brought American ORVR efficiency to 98%.

## **(2) Operations:**

Operations concerning fuel deliveries were discussed in the Spill Control Section.

The equipment that measures product in the tank and all the sensors is manufactured by Veeder Root Corporation. The automatic tank gauge not only determines product inventory, but provides a Continuous Leak Detection System. During periods when the dispensers are not in use, the ATG performs a leak test. The tanks' inventory is monitored for temperature and level for a period of time. The time periods when data is collected is examined statistically to determine if product is being lost from the tank. This statistical tank leak test is in addition to the continuous piping leak test and inventory reconciliation.

The USEPA requires third party certification of all leak detection systems. The Veeder-Root System meets or exceeds all federal requirements for leak detection. Third party evaluations of Leak Detection Systems are now reviewed by the National Work Group on Leak Detection Evaluations. The Veeder-Root System is listed as meeting USEPA criteria.

Cumberland Farms employs a third-party company to monitor, on a 24 hour basis, the Veeder Root system. The connection from the Veeder Root System to the third party may be severed during an electrical outage or communication loss as the connection is made through an IP address which essentially is an internet connection. This is the industry standard for remote monitoring connections and is password protected to prevent tampering at the store level. A loss of connection notifies the third party vendor to begin immediately, working to restore the connection. During the period of loss connectivity, the store is contacted to inform employees of the lost connection and ensure that there are no existing Veeder Root alarms.

The State and Federal Government require the training and certification of people that operate underground tanks that store petroleum products.

There are three categories of operators for each underground tank, A, B, C. The A operator is responsible to be certain that regulations are being met at the company level. The B operator must know the equipment and operation of the tank system and on a monthly basis inspect the tank systems. This includes monthly inventory control in accordance with current regulations.

A & B operators are required to take and pass a test.

The A and or B operator is also responsible for training C operators. A C operator must be present whenever a tank system is in operation. The C operator must be trained to respond to emergencies. Every Cumberland Farms facility that dispenses motor fuels has an A, B or C operator.

Each C operator is trained in accordance with the Cumberland Farms Retail Emergency Response Plan. (See next page)

The current Florida DEP regulations require monthly inspection of all sumps. A visual inspection of all electronic release detection devices every 6 months. Annual testing of leak detection devices and integrity testing of pump and piping sumps every three years.

Summary: The existing gasoline storage and dispensing at the proposed Cumberland Farms Convenience Store and Gasoline Station meets all requirements for the safe storage and dispensing of fuels. The CFI employees are trained in accordance with State and Federal requirements.

- The proposed new tanks will be double wall FRP with brine in the interstice. The brine will detect a breach in either the primary wall or the secondary wall.
- The new piping will be FRP double wall. All piping drains to a containment sump with leak detection sensors.
- Stormwater is treated in a Stormceptor before entering the environment.
- The air pollution control system meets NESHAPS and MACTs

### **(3) Environmental Issues Regarding the Storage of Gasoline**

#### **Fires:**

Report: “**Fires At U.S. Service Stations**” by Ben Evarts, April 2011, National Fire Protection Association, Fire Analysis and Research Division

NFPA Executive Summary regarding fires at stations delivering gasoline:

Report: NFPA's "Fires at U.S. Service Stations"

Author: Ben Evarts

Issued: April 2011

Incident types and trend data are reported for fires that occurred in or at service stations. Three different types of incidents, structure fires, vehicle fires, and outside and other fires are analyzed for cause, equipment involved, and other type of material first ignited, among other relevant factors specific to each incident type. Other information relevant to this occupancy, such as the hazards of static electricity is presented as well.

Executive Summary:

During the five-year period of 2004-2008, NFPA estimates that U.S. fire departments responded to an average of 5,020 in service or gas station properties per year. These fires caused an annual average of two civilian deaths, 48 civilian fire injuries, and \$20 million in direct property damage. The majority of the fires in this category were vehicle fires. Reported fires in this occupancy group fell 46% from 7,860 in 1980 to 4,280 in 2008.

According to the U.S. Census Bureau, there were 117,000 gasoline stations in the United States in 2007. Fires in these occupancies represent a variety of incidents, including structure fires, vehicle fires, outdoor fires and other fires. The majority of incidents are vehicle fires (61%), but the majority of the property damage (59%), results from structure fires. Outside trash or rubbish fires account for 12% of the fires reported to local fire departments at this type of property.

Twelve percent of fires reported to local fire departments in these properties were structure fires. The most common items first ignited in structure fires at service stations were flammable and combustible liquids and gases, piping or filter (22% of structure fires), followed by rubbish, trash, or waste (18%) and electrical wire or cable insulation (13%).

Most vehicle fires (82%) occurred in passenger vehicles, these fires accounted for nearly half of the total number of civilian injuries that occurred in service station fires of any kind (structure, vehicle, outside, other). The most common type of material first ignited in a vehicle fire was gasoline (28%).

Outside and other fires accounted for 15% of incidents at service stations. Natural vegetation fires accounted for 42% of these incidents. The most common heat source for outside fires was smoking materials (21%).

Twelve percent of fire incidents at service stations were outside trash or rubbish fires.

Individuals interested in keeping service stations safe from fire should consult NFPA 30A – Code for Motor Fuel Dispensing Facilities and Repair Garages for information about fire prevention in these properties. The proposed Cumberland Farms Facility meets all the requirements of NFPA 30A – Code for Motor Fuel Dispensing Facilities.

Excerpts from the report:

Structure Fires: 600 Structure Fires caused 1 death and 15 injuries per year. “Many fires in service stations started in the cooking area, or in a lavatory or bathroom.” The balance of the structural fires was caused by failure of heating systems or electrical systems.

Vehicle Fires: 3,050 Vehicle Fires caused an annual average of 1 death and 29 injuries per year. Of and average of 3,050 vehicle fires, 2,500 were passenger vehicle fires.

“A flammable liquid or gas being spilled was a factor in 4% of vehicle fires at service stations.” Spilled gasoline on average caused one injury per year. (Approximately 1 out of 1,000 stations dispensing gasoline will have a fire as a result of spilled gasoline.)

“The majority of vehicle fires at service station or gas station properties began in the engine area. The engine area, running gear, or wheel area was the area of origin for 74% of vehicle fires at these properties. The passenger area of the vehicle was the area of origin for 6% of fires, and 4% of fires originated in the fuel tank or fuel line of the vehicle.”

The dispenser closest to the residence is 200 feet away and mostly shielded by the convenience store. It is unlikely that a fire would have an impact upon the residence. The Fire Department is right next door.

### **Benzene:**

As stated previously: The gasoline delivery and tank venting system meet California Air Resources Board (CARB) Standards for Enhanced Vapor Recovery (EVR), the National Emission Standards for Hazardous Air Pollutants (NESHAPS), and Maximum Achievable Control Technology (MACT). Based on the vapor pressure of diesel fuel, diesel tanks do not have vapor recovery.

New vehicles with carbon canisters emit very little gasoline per fill up. Onboard Refueling Vapor Recovery (ORVR) systems, dramatically limit refueling emissions. The EPA implementation of ORVR rules has brought American ORVR efficiency to 98%.

Benzene currently occurs in gasoline at 0.62%. The USEPA is continuing to lower the acceptable levels of benzene.

The pressure vacuum vents installed on the gasoline tank vents limit the emissions from the tanks to 0.17 Standard Cubic Feet per Hour. 0.17 Standard Cubic Feet equals the 293 cubic inches about the size of a professional football. The Benzene content in the 293 cubic inches is 1.8 cubic inches. Gasoline is not continuously emitted from the tank vents. As the gasoline tanks are emptied by filling vehicles, a slight vacuum is placed on the tanks. Air is therefore sucked into the tanks and no emission of gasoline vapors occurs.

My experience is that gasoline vapors cannot be detected when standing under the tank vents.

The location of this proposed fuel dispensing facility is opposite the USCG Base. There is no occupancy for a very long distance across the street.

The climate at Fort Pierce is such that there is nearly always a wind. For seven months from October to May, the average wind speed is 9.2 miles per hour. For 4 months, the end of May to early October, the average wind speed is 6.9 miles per hour. The wind is from the East for 9 months; from the South for 2 months, mid-June to mid-August. The nearest residence to the fueling operations is to the Northeast, about 200 feet from the first gasoline dispenser and about 250 feet from the tank vents.

Given the normal wind speed and the direction of the wind, it is unlikely that the nearest residence will be impacted by the gasoline vapors at any time of the year. With an average wind speed of 7 miles per hour, any vapors from automobile filling will be quickly dissipated.

**(4) Comments Regarding the “Initial Strategy Analysis-Harbour Isle Preservation & Cumberland Farms.”**

Page 1. Summary; “Four of the 38 Harbour Isle residential buildings will be within 500 feet of the gas station.” Cumberland Farms currently operates a Convenience Store with gasoline at 975 Seaway Drive. Currently two buildings at 38 Harbour Isle, ½ if the tennis court and the St. Lucie Fire Station and two residential buildings on Bayshore Drive are within 500 feet of or the 975 Seaway Drive. At the proposed location of 801 Seaway Drive, three Harbour Isle residential buildings will be within 500 feet of the dispenser island. Two of the three buildings will be blocked from the dispenser island by the Cumberland Farms Convenience Store. Please see the attached Google Earth map entitled “Location of Living Units from dispensers and tanks.”

Page 2. Health Effects; The California “Air Quality and Land Use Handbook: A Community Health Perspective.” April 2005, California Environmental Protection Agency, California Air Resources Board.

The assessments upon which the data and therefore the recommendations are made is based on old technology, no longer employed at modern gas stations. Cumberland Farms employs Enhanced Vapor Recovery (EVR) as required by the current California Air Resources Board (CARB). For instance, Phase II Vapor Recovery is cited in the report and is an important source for models that created the 500 feet recommended distance from gasoline dispensing facilities. Phase II Vapor Recovery has been replaced by carbon canisters located in vehicles. New filling equipment, the hose nozzle and the new vehicle fill pipe force gasoline vapors into carbon canisters located in the air inlet to the automobile engine. Therefore, filling gasoline tanks emit very little gasoline per fill up. The gasoline vapors stored in the carbon canisters are mixed with air and incinerated in the vehicles' engine.

On May 9, 2012 EPA Administrators released their final rule making which acknowledged enough ORVR systems were operational to remove further need for Stage II systems. Onboard Refueling Vapor Recovery (ORVR) systems, dramatically limit refueling emissions. The EPA implementation of ORVR rules has brought American ORVR efficiency to 98%.

In addition to the elimination of the Phase II, Cumberland Farms installs all the requirements of the CARB. The CARB has required new designs of existing equipment to eliminate vapor emissions from gasoline dispensing facilities. The vent pipes have pressure vacuum valves. The hose connections are now designed to eliminate vapor emissions during idle periods. The equipment that measures inventory is now designed to prevent gasoline vapor emissions.

These new CARB regulations were not in effect when the Air Quality and Land Use Handbook: A Community Health Perspective was created in April 2005.

Page 6 sites a Johns Hopkins University, HUB publication entitled “Small spills at gas stations could cause significant public health risks over time”, October 7, 2014.

This publication sites research that approximately 1 gallon of gasoline is spilled daily at a typical gas station.

The publication cited in the October 7, 2014 article above is in the Journal of Contaminant Hydrology, published online September 19, 2014. The document is entitled “Infiltration and evaporation of small hydrocarbon spills at gas station”

A review of the document is that it is basically a modelling exercise with many assumptions about the characteristics of gasoline in concrete. Some of the “proof” of the modeling was by using concrete from the sidewalk of the city of Baltimore. There is no data as to the strength or thickness of the concrete. It is unlikely the City of Baltimore pays for the specification of concrete that Cumberland Farms uses in its facilities. Cumberland Farms

installs concrete with a minimum strength of 4,000 psi and a thickness of 6 inches. It is unlikely gasoline will penetrate this concrete to affect groundwater.

Page 7 also indicates “scientific studies” of plume travel may be 400 feet. Plume travel depends upon the porosity of soil and the slope of groundwater. A 400 feet plume is most likely from a large spill with groundwater sloping away from the source. Given the topography of this site, the slope of the groundwater is nearly flat. The case of a surface spill penetrating concrete at the proposed Cumberland Farms gasoline and diesel fuel dispensing facility and migrating to nearby waters is very unlikely.

Web Engineering Associates, Inc.

A handwritten signature in black ink that reads "William E. Baird". The signature is written in a cursive style with a prominent initial 'W'.

William E. Baird, PE, LSP

**ROBERT P. COLUCCIO, P.E., 4L Rocco Drive, Derry, NH**  
**Chemical Engineer**

**PROFESSIONAL CERTIFICATIONS:**

Commonwealth of Massachusetts – Certification No. 41274  
State of New Hampshire – Certification No. 10319  
State of Rhode Island – Certification No. 7846  
State of Connecticut – Certification No. 21912  
State of Florida – Certification No. 24739  
State of Maine – Certification No. 12900

**EDUCATION**

1984 - Master of Science, Chemical Engineering; Clarkson University, Potsdam, NY  
1982 - Bachelor of Science, Chemistry, State University of New York at Oneonta, Oneonta, NY

**EXPERIENCE**

Mr. Coluccio brings over 30 years of professional experience with hundreds of environmental and chemical engineering/design projects. His expertise includes: Design of chemical, petroleum, propane, and natural gas facilities, wastewater treatment plants, chemical process control, vehicle, marine, and aircraft refueling facilities, spill prevention and countermeasure, failure analysis, stormwater and sewer management, as well as design and implementation of remedial action systems for hazardous waste sites, hazardous waste site investigations, and air quality permitting.

Other experiences include: Expert witness, mediation, public hearings, licensing, appeals, and special permitting with planning boards, conservation commissions, city councils, board of selectmen, state and local fire marshals, Army Corps of Engineers, U.S. Coast Guard, and Massachusetts Port Authority.

**Engineering Design**

***Chemical and Fuel Process Control and Storage Facilities:*** Design of aboveground and underground storage tanks and process control systems for chemical, propane, natural gas, and fuel handling facilities; flammable and viscous chemical and hazardous waste storage and handling, fire risk assessments, fire protection, truck traffic, secondary containment and leak detection, truck loading/unloading, plant wide distribution, spill prevention and countermeasure.

***Industrial Wastewater Treatment Plant:*** Design of wastewater treatment plants employing dissolved air flotation, chemical flocculation, pH adjustment, oil/water separation, chemical destruction of organics,

sedimentation design, sludge management, high level controls and building design. Interface with municipal waste treatment plants. Solve regulatory issues.

***Vehicle, Marine, and Aircraft Refueling Stations:*** Designed and installed vehicle, marine, and aircraft refueling stations in Boston Harbor and throughout Massachusetts. Designed and installed largest marine refueling stations in Massachusetts serving cruise vessels, commercial fishing vessels, and pleasure boats. Interface with U.S. Army Corp of Engineers, U.S. Coast Guard, Massport Fire and Rescue, Massport Environmental, Boston Conservation Commission, and Massachusetts Department of Environmental Protection.

***Inventory Control and Spill Prevention:*** Designed inventory control system for large fuel storage depots including a multi-million gallon fuel farm for a power generation plant. Experience includes No. 6 Fuel oil, epoxy resins, Class I and II liquids, ultrasonics, weigh scales, concrete, steel, and fiberglass containment structures.

***Stormwater and Sewer Management:*** Design of stormwater management systems, site survey and re-grading, oil/water separation, manway structures, concrete pads and containment dikes, NPDES and sewer discharge permitting

### **Site Assessment and Remediation**

***Oil and Hazardous Material Releases:*** Emergency response and investigation, remedial design and implementation following releases of oil or hazardous material to the environment. Representative projects include:

Investigation and remediation of gasoline, fuel oil, chlorinated solvents, and PCB releases. Phase I site assessments, subsurface investigations, MCP Compliance, Notifications of Activities and Use Limitations, and Tier Classification. Remedial design includes: Vapor Extraction, Air Sparging, Oil/Water Separation, Air Stripping, Carbon Filtration, Catalytic Oxidation, and Bioremediation.

### **Project and Contract Management**

***Contract Management:*** Managed numerous site-specific projects for state, federal, and private clients from proposal phase to final construction approval. Prepare cost estimates, bid documents, written specifications and drawings. Provide consultation during contractor selection and submittal approvals, and oversight during construction. Project values range to \$2,000,000.

### **Air Quality Permitting**

***MADEP Source Registration Regulatory Compliance:*** Performed mass balances to determine volatile organic emission status of industrial facilities, interface with regulatory agencies regarding category updates and compliance fees

**WILLIAM E. BAIRD, PE, LSP, MISCO**  
**President, Web Engineering Associates, Inc.**  
**President, MicroSorb Environmental Products, Inc.**

Lafayette College 1965  
B.S. Mechanical Engineering

Boston College 1973  
Masters, Business Administration

Registered Professional Engineer - Commonwealth of Massachusetts  
- New Hampshire

Licensed Site Professional – Commonwealth of Massachusetts

Certified Waste Water Treatment Plant Operator - Commonwealth of Massachusetts

Licensed Third Party Inspector, Class A & B Operator Underground Storage Tanks -Commonwealth of Massachusetts

American Society of Petroleum Operations Engineers - Past President - no longer active

Additional Memberships: Petroleum Equipment Institute, National Fire Protection Association, International Spill Control Organization, New England Fuel Institute, Massachusetts Oil Heat Council, National Groundwater Association. Licensed Site Professional Association

OSHA Confined Space Entry Certification, OSHA 40 Hour Hazardous Waste Operations Certification  
API Safety Certification – Service Stations, Production Facilities

Lectures and Papers

Manuscript - Pollution Engineering, July 1988 - “Critical Evaluation of EPA’s UST Testing Apparatus”

American Society of Petroleum Operations Engineers - “Examination of Above Ground Petroleum Storage Tank Bottom/Shell Weldments”

Article - New England Real Estate Journal, “Proper Control Needed To Keep Tanks An Asset”

Article – Co-author, Pollution Engineering, March 2002 – “Success Story” (Article about innovative bioremediation of brownfields site, Baycity, MI)

Guest Lecturer - California Association of Health Professionals - Underground Tank Dynamics and Physical Principles Affecting Precision Testing

Guest Lecturer - USAF Precision UST Testing Methods

Guest Panellist - American Society of Mechanical Engineers- Physical Principles of Underground Tank Leak Detection

Battelle Memorial Institute – co-author, Remedial Actions in Response to a Kerosene Release to Wetlands

University of Massachusetts, Amherst – co-author, Bioremediation of Bedrock Groundwater Contaminated w/ PCE, TCE, TCA, Toluene & Hexane

#### Continuing Education:

University of Wisconsin Professional Courses:

Cathodic Protection of Underground Structures

Underground Storage Tank Management

Liquid Storage Tank Installation

National Association Corrosion Engineers, Professional Courses:

Cathodic Protection, Corrosion Basics

Second International NACE/MTI Symposium - AST; Design, Inspection, Maintenance

Northeastern University:

Graduate Courses in Environmental Engineering

Government Institutes:

Environmental Laws and Regulations

University of Massachusetts:

Annual Seminars on Petroleum Products in the Environment and Remediation Technologies

Environmental Protection Agency:

Leak Detection Technology Transfer Seminar

Environmental Protection Agency:

Region IV Seminar on Remediation of Petroleum Contaminated Sites

American Petroleum Institute:

1999 Storage Tank Management and Technology Conference

National Groundwater Association/American Petroleum Institute

2000 Petroleum Hydrocarbons and Organic Chemicals in Ground Water

NFPA – National Electrical Code – Hazardous Area Classification

PEI – CNG Systems for Automotive Fuelling

Instructor - Hartmann Management Services - University of Wisconsin, UST Installation Course

- Expert Witness
- Provided expert witness regarding an explosion and fire during a gasoline delivery
  - Provided expert witness regarding vibration stress failure of 12” diameter LNG pipeline
  - Chapter 21E Site Assessment - US Bankruptcy Court
  - Numerous appearances before Planning Boards, Selectmen, Zoning Board of Appeals, Conservation Commissions regarding Storage Tank Designs/Operation
- Expert Consultation
- Provided report documenting tank installation practices, tank management, petroleum industry practices, regulations and recommended practices regarding tank failure
  - Provided a report regarding tank management practices and residual groundwater contamination
  - Assisted Department of Defence in evaluation of leak testing equipment for a 1,000,000 gallon UST
  - Witnessed excavation and provided report regarding failure of cathodically protected UST - 3 Sites
  - Provided a report detailing the safety violations which caused an explosion while a gasoline underground storage tank was being abandoned.
  - Examined a tank failure of a new tank installation and provided a report detailing the cause of the failure
  - Naval Education and Training Centre - Investigate Failure of Two-1,000,000 Gallon Underground Storage Tanks, Review Design, Provide Expert Testimony as to Cause of Failure
  - Provided a report on the failure of an AST storing sulphuric acid, failure of the containment structure and exposure of sulphuric acid fumes to an abutter.
  - Provided a report as to the requirement to replace underground piping when an automobile displaced a gasoline pump on an island.
  - Provided a report about underground storage tank anchoring and floatation
- Invention
- Co-invented and developed the “Tank Auditor” (Patent #4811601). A certified precision underground storage tank testing method. (10,000+ tests have been conducted with this method)
  - Co-invented a hydraulic separator pump to condense and remove floating products (Patent #5207897)

Co-invented a Catch Basin OWS and Bioreactor

Co-invented a “Biofence” to control spills and apply microbes for bioremediation of oils.

Public Service: Elected Member - Town of Cohasset Board of Health- 7 years,

Town Committees: Recycling Transfer Station, Watershed Protection,

Sewer Study Committee, Hazardous Materials Guidance

1975 President of Web Engineering Associates, Inc.

To Present Professional Staff - 2 Engineers, 1 Geologist, 1 Land Use Planner, 2 Technicians

Petroleum & Chemical Engineering: Included in design experience is tanker and barge terminal facilities, bulk oil plants, hazardous waste storage systems, marinas, service stations, industrial fuel oil storage systems, tank truck and railroad loading and unloading facilities, air pollution control systems, spill prevention control and countermeasure plans, pump and piping systems, tank heaters, tank repair, lube oil storage and drumming facilities, solvent storage, solvent distillation, chemical waste water treatment, piping and process systems.

The products include crude oil, #1 to #6 fuel oils, gasoline, fish oils, biofuels, flammable solvents, alcohols, chlorinated solvents, heated flammable resins, natural gas, LPG, steam, pesticides, and herbicides.

Environmental Engineering: More than 400 site investigations for surface and subsurface contamination. Included in experience is investigation of petroleum, solvents, pesticides, PCB and foundry landfill plumes, design and installation supervision of interceptors and recovery equipment; innovative bioremediation, vacuum educators, air stripping columns, water and vapor carbon systems, landfill capping, monitoring and reports. (Responsible for the first bioremediation system in the Commonwealth located in Turkey Swamp, Halifax, MA. Saved destruction of the wetlands and documented the efficacy of bioremediation to uplands and wetlands).

Tank Testing: Two crews precision leak tested 4000+ tanks.

1996 Founded MicroSorb®Environmental Products, Inc. a company to  
to facilitate the use of wastewater treatment systems and insitu  
Present bioremediation through design and application of microbes and to distribute microbial remediation and microbial cleaning products.

1983 Founded Leak Detection Systems, Inc., a company to license and to market  
To the “Tank Auditor” underground tank leak detection system.

1997

1975  
to 1981

Construction: Developed a mechanical construction company that employed 20+ people with annual sales of +\$1,000,000.00. Construction projects included a \$225,000.00 tank truck loading facility for gasoline and distillates with vapor recovery. Installation of 3000' of 14" diameter pipe connecting tanks, pumps and loading facilities; installation of 600' of 6" diameter high pressure natural gas pipeline; installation of plant and equipment to reclaim solvents; underground storage tank removals and installations; stainless steel process and steam piping.

1973  
to  
1975

Proprietor, Web Engineering Associates

Began company to provide engineering and construction expertise to oil industry. Engineering projects included engineering review of the design of a 600' - 24" diameter #6 oil line; design of a 40' pipe bridge; design of Spill Prevention, Control and Countermeasure Plans. Construction experience included developing a company to provide service station pump and tank installation and small bulk oil storage plant installation.

1971  
to  
1973

Engineer, Chevron Oil Company, Western Division, Marketing Operations, Denver, Colorado

Develop and coordinate company wide projects for five marketing divisions in ten Mid-Western states. Projects included feasibility study of lube oil blending and canning plant, construction costs- \$2,000,000.00, annual costs- \$12,000,000.00; design and implementation of a \$3,000,000.00 OSHA compliance program; gasoline, diesel and aviation fuel quality control; development of an environmental protection program; implementation of compliance with Department of Transportation regulations.

Responsible for specification and purchase of equipment and facilities, including transport tank trucks; warehouse and bulk storage facilities, self service gasoline stations, and tank truck loading facilities, vapor recovery equipment.

1968  
to  
1971

Associate Engineer, Chevron Oil Company, Eastern Division New England Region

Responsible for estimating costs, payout calculations, and engineering design and construction in eighteen bulk plants and two terminals in Maine, New Hampshire, and Massachusetts. Responsible for estimating costs, design, presentation of plans to local officials, and construction of service stations.

Major projects included analysis, design and installation of new tanker terminal piping system; improving loading rack capacity and safety; oil spill contingency plan; designed, secured permits and supervised construction of sixteen service stations. Designed systems to remove gasoline and oils from the groundwater and vapors from residences. Supervised UST testing.

1965 Associate Design Engineer, Chevron Oil Company, Eastern Division,  
to Perth Amboy, New Jersey  
1968 Responsible for estimating costs, payout calculations, design, drafting,  
field construction, and contract administration of refinery projects.

## Mel Scott, AICP

Regional Business Development & Sales Director

Mel Scott has 20 years of Brevard County public service experience in a wide range of professional disciplines, highlighted by his 7 year tenure as Brevard County's Assistant County Manager. Overseeing departments which included Planning & Zoning (formerly the Growth Management Dept.), Public Works, Utility Services and the former Metropolitan Planning Organization (which is now the SCTPO), Mel is a valuable team member that knows this community and has a proven track record of driving quality outcomes.

Specifically, his experience includes participation in the inception, planning and construction phases of many multi-jurisdictional roadways, including the St. Johns Heritage Parkway, as well as the oversight of Public Works Department efforts that are entrusted with maintenance and capacity improvements for 1,177 miles of paved roadway, or enough to travel from the Space Coast to Connecticut! During his service in Brevard County, he supported the continued investment in ITS technology and, ultimately, the completion of a comprehensive ITS Master Plan which continues to guide extensive vehicle detection upgrades within the County's ITS system today.

As a *Project Advisor*, Mel will make sure that ATKINS provides the right level of staff, that the team remains available throughout all work processes and will regularly contact SCTPO leadership to verify that you are satisfied with the ATKINS team's work.

For 28 years, Mel has been an active member in the planning profession and is a member of the American Institute of Certified Planners (AICP). His knowledge of local, state and federal regulatory structures and commitment to this region's success, will be dedicated to the SCTPO's responsibility to manage a continuing, cooperative and comprehensive planning process in support of an evolving transportation network designed to improve quality of life, add economic viability and enhance safety within our community.

Prior to joining Atkins, Mr. Scott's experience included:

**Blue Ribbon Transportation Advisory Committee Report and Recommendations (BRAC):** Technical Staff Support; Recognizing the critical role that infrastructure plays in promoting economic development and community welfare, as well as the burgeoning mismatch between infrastructure revenues and needs, the Brevard County Board of County Commissioners established this Committee in 2013. Over a course of 8 months Mel worked with other County/City/TPO staff, and BRAC members in public forums to identify sustainable short and long term funding solutions for BCC or voter consideration for the purpose of bridging the gap between funds needed and funds available to sustain Brevard's roadway network.

### Civic/Community Involvement

Immaculate Conception Church – Board of Trustees, 2002 – Present  
Immaculate Conception Church – Fund-Raising Chair, Children's Education Fund  
United Way – Past Fundraising Chair, Brevard County Board of County Commissioners

---

### Education

M.A., Urban and Regional Planning, Political Science and Government, Florida Atlantic University, 1991

B.A., Political Science, Criminal Justice, University of Tampa, 1988

---

### Certifications

American Institute of Certified Planners, American Planning Association (AICP), 1989.

---

### Professional affiliations

American Planning Association, Florida (1989 – Present)

Florida Chapter, American Planning Association (1989 – Present)

Florida Atlantic Planning Society, Founding President (1990)

International City/County Management Association (2013 – Present)

---

### Professional development

Brevard Executive Leadership (ELI), Graduate, 2011

**Mel Scott, AICP**

Regional Business Development &amp; Sales Director

Boys/Girls Head Basketball Coach, HNJ School, South Beach Basketball Association (2006 – present)  
Board of Directors, Keep Brevard Beautiful

**Previous Work History**

Director, Property Research & Acquisition  
Certified Building Corp, Indialantic, FL  
2004 – 2007; Responsible for property research, acquisition, design and permitting or residential communities in Brevard & Indian River Counties.

Director, Planning & Zoning Office (Zoning Official), Brevard County  
1998-2004

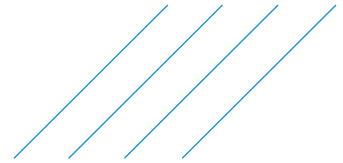
Responsible for implementing, amending and interpreting the Comprehensive Plan and Zoning Code. Provided leadership for the day-to-day operations and budget management for the department which included continuous improvement of the permit review and approval process, code enforcement, contractor licensing and impact fee program of Brevard County.

**Number of Years with Other Firms:**

3 – Certified Building Corp.

**Do You Hold a Public Elected or Appointed Office?**

Office Held: Supervisor  
Name of Agency: Brevard Soil & Water Conservation District  
Term Expiration: 1996 - 2000



## Jeffrey A. Lucas, PE

### Project Manager

Jeffrey Lucas has 18 years of land development, water resources, and consulting experience involving commercial, residential, and municipal project layout, permitting, and design; four of these years were involved with construction practice as an active member of the U.S. Army on deployments in countries abroad. Other experience includes field inspection, environmental site assessment work, and port engineering projects. His responsibilities include site design, planning, project management, permitting, and related engineering assessments, calculations, and modeling. Mr. Lucas is experienced in land development conceptual and master planning activities including zoning changes, land use amendments, and master plan compliance related to utilities and administrative actions. He has directly coordinated management of project subconsultants as well as interacted with clients, legal counsel, and municipal and regulatory agencies to see projects planned from design to construction.

Mr. Lucas' project experience includes:

#### **Cumberland Farms Gas Stations and Convenience Stores, East Coast, FL.**

Project manager and engineer of record for site civil work for proposed new construction of site planning and land development for these new facilities. Managed traffic engineering team for traffic studies, Geotech investigation, surveying, eco-bio studies, community planning, petroleum tank and pump plans, landscape and irrigation, and various permits amongst numerous agencies. Construction administrative services are also included. Approximately 20 facilities have been constructed to date from program inception timeframe of about 2012.

**Big Box Retail Development Conceptual Planning, Orlando, FL.** Performed site reconnaissance and due diligence to include meeting with planning and zoning officials to discuss moratoria and lot aggregation issues. Submitted conceptual access plan to FDOT to obtain preliminary assessment. Performed conceptual stormwater models to address flow-restricted watershed basin criteria. Drafted conceptual stormwater management system using AutoCAD. **Duration:** 10/2007-11/2008

#### **Big Box Home Improvement Center Retrofit Project, Rockledge, FL.**

Coordinated/designed site expansion to accommodate an adjacent roadway expansion project including right-of-way donations. Designed and permitted construction plans for infrastructure improvements and utility relocations. Evaluated existing stormwater master plan and obtained a letter of conformance from regulatory agency. Evaluated municipal roadway expansion project and planned/coordinated traffic study for a signal warrant analysis of a future intersection. Met with municipality to gain project approval within a community redevelopment area including variances. Provided project status updates for clients and consultants. **Duration:** 02/2007-12/2008

#### **La Fourche and Plaquemines Parrish Levee Inspections, New Orleans, LA.**

Completed 90 miles of levee and 2 major pump station inspections to inventory deficiencies for input into the National Levee Database (NLD) for use in hazard insurance. **Duration:** 08/2010-12/2010

#### Total years of experience

---

18

#### Years with firm

---

9

#### Education

---

B.S., Civil Engineering, University of Central Florida, 2005

#### Registrations/licenses

---

Professional Engineer  
Florida 71621, 2010

#### Certifications

---

State-Certified Stormwater Management Inspector  
Class "B" Commercial Driver's License  
TWIC Card Carrier

#### Honors and awards

---

3rd in State, Water Resources Design Competition, Florida Water Environment Association (FWEA) Commendation, Achievement, and Good Conduct Medals, U.S. Army Florida Engineering Society, Member National Society of Professional Engineers, Affiliate

#### Software

---

ICPR, SewerCAD, WaterCAD, OPSEW, PONDS, MODRET, StormCAD, AutoCAD (Civil 3d/LDD), ARCEXplorer/GIS, Derive 5, HY-8, PUMP-FLO, SMADA, Microsoft Project, Hydraflow, Trimble GPS

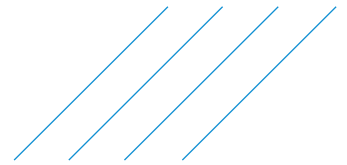
#### Professional development

---

Advanced Best Management Practices (BMP) Selection Course, Florida Stormwater Association, Orlando, FL.  
Stormwater Permitting Course, Florida Engineering Society, Orlando, FL.  
Stormwater Management Design Course, Water Resources Learning Center, Orlando, FL.

## Jeffrey A. Lucas, PE

Project Manager



**Various Community Block Grant Projects, Brevard County, FL.** Designed and permitted various sidewalk, neighborhood entry signs, pedways, and roadway restoration plans for the County. Also included construction administration. Duration: 02/2011-11/2012

**SR524 Logistics Center, Canaveral Port Authority, Cocoa, FL.** Project manager and the engineer of record for site civil work for proposed new construction of site planning and land development for new logistics center encompassing 270 acres. Managed traffic engineering team for traffic studies, geotechnical investigation, surveying, eco-bio studies, community planning, and various permits amongst numerous agencies. Also provided cost estimation and stockpile planning. Project was constructed as Walmart Distribution Center.

**CT6 Cruise Terminal Design-Build/CT6 Parking Garage Design-Build at Port Canaveral, Canaveral Port Authority, FL.** Project manager and engineer of record for site civil work for new construction of these facilities. Prepared fast track design-build plans for site civil project aspects – planning, potable water, lift station, permitting, and construction administration. Unique aspects included Fuel Line impact mitigation planning, survey layout, and pile driving coordination. Performed design of the commercial vehicle staging access lot. Design Fees: ± \$200k; Constructed in Summer 2012; Project size: approx. 20 acres of sitework with ±300,000 SF of building area; Cost: ±\$40M; ODP's were contractor managed.

**Miss Cape Canaveral, Canaveral Port Authority, Port Canaveral, FL.** Project manager/engineer of record, performed site layout and design of demolition and relocation of a deep sea fishing charter operation. Project entailed design of a dock/deck by filling in a dilapidated, unutilized boat ramp, pad placement of a modular building, utility and lift station design, all while designing around the ongoing and recently completed Cove Welcome center stormwater outfall project (by others). Also managed construction administration. **Duration:** 01/2013-03/2013

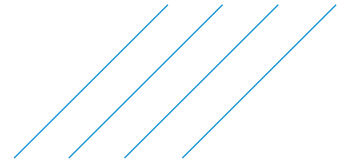
**Big Box Retail Retrofit Construction Inspection, St. Augustine, FL.** Coordinated with contractors on inspection scheduling and resolving potential change orders. Inspected infrastructure improvements for as-built certification. Checked depths of pavement cross sections and landscaping placement. Evaluated compaction test results from subconsultant. Prepared written and pictorial reports of site construction progress for client. Coordinated with municipality and contractor to resolve Americans with Disabilities Act (ADA) compliance issues. **Duration:** 01/2008-01/2009

**Big Box Retail Site Development, Lynn Haven, FL.** Designed, modeled, prepared reports, and permitted onsite wet detention stormwater management system. Designed and permitted offsite stormwater quality management system including wetland mitigation. Evaluated geotechnical, environmental, and ecological reports. Consulted with client legal counsel and Audubon Society regarding site's previous wetland mitigation banking success criteria and future cost. Performed offsite large-scale stormwater model evaluating floodplain to assess conveyance impacts regarding state road improvements. Coordinated with agencies, municipalities, and consultants to gain design approvals. Prepared exhibits for subconsultants for the U.S. Army Corps permitting department. Drafted onsite and offsite infrastructure improvements. Consulted on water study reports (flow tests) to determine if adequate municipal supply exists for site development. Performed initial onsite drainage investigations and researched drainage records. Attended required state agency pre-application meetings. **Duration:** 01/2008-02/2009

Stormwater Management Inspector's Course, Florida Department of Environmental Protection, Cocoa, FL. Leadership Course, Creech Engineers Inc., Stuart, Florida. Stormwater Modeling Course, Streamline Technologies, Inc., Orlando, FL. Indirectly affiliated with the University of Central Florida (UCF) Stormwater Management Academy (former student, attended meetings on stormwater sustainability with researchers to gain latest knowledge for clients on green roof, pervious pavements, stormwater reuse, etc.)

**Jeffrey A. Lucas, PE**

Project Manager



**Big Box Retail Site Development #1, Madison, FL.** Designed and permitted wet detention stormwater system. Designed and permitted offsite lift station and forcemain. Coordinated with municipal consultants on design approvals. Performed initial onsite drainage investigations. Coordinated with subconsultants and client legal counsel on past environmental issues associated with lumber mill activities. Performed subsurface removal estimates of buried debris using geotech borings. Performed cut and fill calculations. Coordinated with environmental/geotechnical consultants for cost-effective design solutions to subsurface instability using Tensar GeoGrid technology. Designed offsite roadway improvements. Provided project status updates to project managers. Coordinated project surveys from subconsultants. **Duration:** 05/2006-07/2007

**Large-Scale Commercial Subdivision Master Plan, Palm Bay, FL.** Prepared cost estimates. Maintained project schedule. Drafted conceptual plans, construction plans, and specifications. Coordinated with client, agencies, sub-consultants and municipalities to see project from inception to construction. Negotiated with client legal counsel and agencies to donate mutually beneficial right-of-way in support of a state roadway project. Designed and modeled master stormwater, wastewater, and potable water utilities. Designed offsite roadway improvements. Prepared utility calculations, reports, and permits. Hired subconsultant to perform traffic study. Managed ecological subconsultant in permitting the relocation of gopher tortoises in an offsite preserve. Coordinated with municipal consultants to obtain design approvals. Managed platting approval with a municipality. Coordinated project to complement FDOT intersection improvement project. **Duration:** 07/2007-05/2008



Engineering & Planning, Inc.

1172 SW 30<sup>th</sup> Street  
Suite 500  
Palm City  
Florida 34990

**Point Of Contact:**

Shaun MacKenzie, P.E.  
772-286-8030

[shaun@mackenzieengineeringinc.com](mailto:shaun@mackenzieengineeringinc.com)

FDOT Prequalified Consultants:  
FDOT Work Group 3.  
Roadway Design  
3.1 Minor Highway Design

FDOT Work Group 6.  
Traffic Engineering & Operations  
Studies  
6.1 Traffic Engineering Studies  
6.2 Traffic Signal Timing

FDOT Work Group 7.  
Traffic Engineering & Operations  
Studies  
7.3 Signalization

FDOT Work Group 13. Planning  
13.3 Policy Planning  
13.4 Systems Planning  
13.5 Subarea/Corridor Planning  
13.6 Land Planning/Engineering  
13.7 Data Collection

**MacKenzie Engineering & Planning, Inc. (MEP)** was established in 2010 and is headquartered in Palm City, Florida. **MEP** specializes in transportation planning and engineering, growth management, and project implementation. The benefit is that **MEP** can develop concepts that can be cost effectively implemented.

Since 2001, Mr. MacKenzie has been practicing Transportation Planning and Engineering for both the public and private sectors. **MEP** has 5 full time employees and can utilize 4 flexible time employees. Our mission is to provide Superior Client Service and Technical Expertise. We use our extensive transportation knowledge, local experience and established relationships to deliver the best solution for our clients. We are able provide extensive knowledge and skills to our clients with the superior client service, one expects from a small business. Our experience includes, but is not limited to the following categories:

- Transportation Planning
- Parking Planning
- Signal Design
- Minor Roadway Design
- Statute, FAC, LDC Interpretation
- Data Collection
- Transportation Modeling
- Bicycle & Pedestrian Facility Planning and Design
- Transportation Impact and Mitigation Studies
- Transportation Analysis
- Interchange Justification & Modification
- Site Plan and Concurrency Reviews
- Corridor Evaluation and Feasibility
- Development of Regional Impact Review
- Multimodal Analysis
- Mobility Planning



---

# Shaun G. MacKenzie, P.E. 61751

## Principal Engineer

### Professional Credentials

Professional Engineer in Florida  
Master of Science, Civil Engineering, University of Florida  
Bachelor of Science, Civil Engineering, University of Florida  
Advanced Maintenance of Traffic Certified

### Organizations

St. Lucie TPO Bicycle & Pedestrian Past Chair  
Institute of Transportation Engineers  
(Past President Treasure Coast Chapter)

### Professional Qualifications

**Past Experience** Mr. MacKenzie has over 18 years of experience in traffic engineering conducting numerous transportation projects, including traffic engineering studies, transportation planning studies, parking studies, signal systems, traffic operations, and pavement markings. With extensive experience working with HCS and Synchro for intersection operations, VISSIM for examining multimodal alternatives and unique conditions, CorSim and SimTraffic simulation modeling, Art-Plan arterial planning tools, FSUTMS Cube/Voyager transportation modeling, and Synchro for signal system timing plans, and AutoCAD for design, signing and pavement marking.

### **Traffic Impact Analyses, Various Clients, FL – 2001-Current**

Numerous traffic and transportation reviews, Intersection Safety Reviews, Data Collection, Parking Study Reviews, Code Creation, Code Review, Code Implementation, Long Range Transportation Plan, LOS interpretation and reporting, Site impact analyses, internal capture analysis, congestion management solutions, access management and access management solutions.

### **Parking Studies – Southeast Florida – 2010-Current**

Developed parking recommendations based on observation and needed parking supply based on information contained with the Institute of Traffic Engineers' report, Parking Generation, 4th Edition and the Urban Land Institute's report, Shared Parking, 2nd Edition. Sites include 5th Avenue Shops, 1600 North Federal Highway, 831 East Palmetto Park Road, 331 East Yamato Road, Pine Circle Villas, 4000 North Federal Highway, Royal Palm Plaza, University Shoppes, 21302 St. Andrews, 3501 North Federal Highway, 2399 North Federal Highway, 900 North Federal Highway, St. David's Preschool, 55 South Federal Highway, and the Deerfield Building.

### **TLE Concurrency & Neighborhood Analysis**

A proposed school required analysis of its impacts on the neighborhood. The project required traffic data collection of similar schools, queuing observations, queuing analysis, analysis of the roadway network, analysis of the existing neighborhood, and analysis of the existing adjacent Montessori



---

school. Based on neighborhood and school operations, we provided recommendations for hours of operation, traffic circulation, access, required parking, reservoir (throat) distance requirements, turn-lane improvements, and off-site improvements.

### **Indian Trails Improvement District (ITID)**

Special consultant to Indian Trails Improvement District to review transportation studies and impacts to ITID roads and provide recommendations to the ITID Engineer. Over 13,000 dwelling units and four million square feet of non-residential use are approved or proposed adjacent to ITID and will utilize ITID's private roads for transportation and circulation.

### **Okeechobee County On-Call Reviewer**

Provide continuing traffic and site plan review services to Okeechobee County. We make concurrency determinations in accordance with the adopted code and provide our professional opinion to the County on matters of traffic engineering, including: queues, signal warrants, off-site improvements, parking requirements, circulation, site design, trip generation, traffic assignment, and trip distribution.

### **Western Grove DRI - NOPC**

Revise this approved DRI in Port St. Lucie to modify the conditions and identify specific developer improvements, extend the buildout of the project to 2040, and provide certainty to the developer. MEP worked with the City of Port St. Lucie, St. Lucie County, Treasure Coast Regional Planning Council, and FDOT to assist in the approval of the necessary Land Use Amendments and Notice of Proposed Change.

### **St. Lucie West Boulevard Turn Lanes & Signal Modification**

The project was for the design and permitting services of an additional left turn lane and the extension of the existing left turn lane. The project required collecting traffic volumes, vehicle queues and intersection timings along the corridor and the I-95 Interchange ramp signals. St. Lucie West Boulevard was modeled using collected data. The analysis showed that a 1,000 foot second eastbound left turn lane would provide adequate storage capacity and alleviate queuing at this intersection and greatly improve the arterial operation. Therefore, the design included a new 1,000 linear foot turn lane. The design included traffic signal modifications, typical section design, roadway design, landscaping evaluation and approval, signing and striping, stormwater design, maintenance of traffic plan, and new signal timing.

### **Intersection Evaluation – California Blvd & University Blvd**

This intersection was identified in the Congestion Management Process as being a priority project because it has experienced a high level of traffic related issues, including accidents and congestion, during the morning and afternoon peak hours. MEP evaluated the intersection for safety, signal warranting, existing and future intersection operation, and existing and future roadway operation.



---

The study included researching, collecting, and obtaining data to determine the existing traffic patterns, volumes, turning movements, and accidents at the intersection. The study provides recommendations for roundabout and intersection improvement alternatives and preliminary cost estimates for each option.

### **Hypoluxo Road and Adonis Drive Signal Design & Roadway Modifications**

The project was for the traffic signal warrant, design and permitting. MEP collected data for the traffic signal warrant. The data collection included: Qualitative field visit during the AM and PM peak hour, pictures of intersection approaches, signal timing data, and 24-hour traffic volume data. The design and permitting required signal timing and phasing, signing and pavement markings, and pedestrian facilities. The signal was originally designed with mast arms and in order to reduce construction costs and was redesigned with a span wire section. The span wire design utilizing prestressed concrete poles allowed for the required vertical and horizontal distances from the existing FPL, AT&T, and Comcast overhead utilities and the underground water and force mains. In addition, the span wire design included meeting the minimum signal head height requirements and the concrete poles' minimum clear zone requirements.

### **Tequesta US Hwy 1**

MEP performed an analysis of the traffic impacts resulting from a proposed 6 lane to 4 lane reduction. Modified the roadway laneage and improvements to match the existing plus committed roadway network to the projected buildout year. The corridor analyzed the conditions for the existing (year 2014) and future (year 2040) traffic conditions and potential impacts of the proposed lane elimination project on transportation facilities and operations in the corridor as well as the study area. The study included intersection and segment LOS interpretation and reporting, congestion management solutions, access management, access management solutions, safety analyses and conceptual design.

### **High Meadow Avenue Signal & Fiber Optic Network Plan**

The project was for the fiber optic installation, traffic signal warrant, design and permitting. MEP collected data for the traffic signal warrant. The design and permitting required signal timing and phasing, structural analysis, fiber optic schematics and splicing diagrams.

### **Xenon S.A. vs. Exxon**

Expert during mediation. Familiarization with Lennard Road Special Assessment District (SAD). Performed detailed analysis of SAD and improvement costs and gathered historical data related to SAD, contractual relationships and impact fees. Provided guidance during mediation negotiations to client.