February 8, 2018

Charlene Yarnell
Principal
PJHM Architects, Inc.
647 Camino De Los Mares, #201
San Clemente, CA 92673-2807

Subject: Proposal to Prepare Pipeline Safety Hazard Assessment and Rail Safety Study for Ellis Elementary School

Dear Ms. Yarnell:

Thank you for the opportunity to submit this proposal to prepare a Pipeline Safety Hazard Assessment (PSHA) and Rail Safety Study (RSS) for the proposal Ellis Elementary School. This proposal outlines our understanding of the project, our scope of work and fee estimate.

Understanding of the Project

Jefferson School District is proposing develop a new elementary school located within the Ellis Specific Plan area, in unincorporated San Joaquin County, near the Tracy municipal boundary. The proposed 16.0-acre school site is located north of and adjacent to the future extension of Ellis Town Drive, west of Avalon Street.

The school site is approximately 913 feet to an easement to the southwest that contains a PG&E high pressure natural gas transmission pipeline and a Chevron petroleum pipeline. The Delta Mendota Canal is located approximately 1,450 feet southwest of the site. Lastly, the site is approximately 1,120 feet to Union Pacific (UP) railroad track to the south.

The school site was identified in the Ellis Specific Plan and EIR, as referenced below:

» City of Tracy. 2008, updated 2012. *Ellis Specific Plan*

» City of Tracy. 2012. *Modified Ellis Project Draft Revised Environmental Impact Report*

Scope of Work

TASK 1 - PIPELINE SAFETY HAZARD ASSESSMENT

The California Department of Education (CDE) requires a PSHA to be completed for all high pressure natural gas pipelines, hazardous liquid pipelines, and large volume (≥12 inches in diameter) water pipelines that are located within 1,500 feet of a new school site.[1] Based on preliminary information from the National Pipeline Mapping System (NPMS) and the Jefferson School District (District), there is one high pressure natural gas pipeline and one petroleum pipeline in an easement approximately 913 feet southwest of the site. These pipelines could impact the school site.

The scope of work for the PSHA includes the characterization of all natural gas and petroleum pipelines located within a 1,500-foot radius of the school site and the determination of actual or potential

[1] California Department of Education (CDE), 2007. *Guidance Protocol for School Site Pipeline Risk Analysis.*

endangerment to the health and safety of persons who may attend and/or work at the school. A Stage 2 analysis will be conducted for each pipeline, as per the CDE protocol.

Additionally, the United States Bureau of Reclamation and local water purveyors will be contacted to determine if there are any large-volume water pipelines within 1,500 feet of the school site. All large-volume (≥12-inches in diameter) water pipelines, including the Delta Mendota Canal, within the 1,500-foot radius will be evaluated to determine the potential for flooding at the school site.

The analysis will consist of the following tasks:

Determine Pipeline Characteristics. The following companies will be contacted to confirm the previously obtained information regarding the pipelines is still valid:

- Pacific Gas and Electric – map and operating characteristics of the natural gas pipeline
- Chevron Pipeline - map and operating characteristics of the petroleum pipeline
- United States Bureau of Reclamation (USBR) – map and operating characteristics for Delta Mendota Canal
- Local water purveyor - operating pressure, flow rate, and pipeline maps for water pipelines

Determine Land Use and Local Terrain Data. Adjacent land uses, terrain, structures, street grade, storm drains, and utility easements will be identified, with emphasis on the following:

- Structural features, such as retaining walls, buildings, open storm drains, etc. that could block a jet flame or channel liquid flow
- Topography and elevation profiles to determine flow directions for water pipelines
- Potential combustion sources, both stationary and mobile, between the pipeline and the school site, such as motor vehicles, residential home water heaters, commercial/industrial facilities with external combustion sources (i.e., boilers).

Conduct Consequence Analysis. Given a release from the natural gas and petroleum pipelines, the following hazards are considered:

- Jet flame or pool fire
- Flammable vapor cloud
- Unconfined vapor cloud explosion (UVCE), which results in a blast overpressure wave.

The discharge rates and durations for both pipeline ruptures and leaks will be determined. Two types of release scenarios will be assumed: 1) a complete line break along the pipeline route that would occur 20% of the time, and 2) a leak through a one-inch hole that would occur 80% of the time. The distance at which no adverse impact is expected to occur to human health will be determined, which is defined as follows:

- Distance to direct contact with a jet flame or pool fire
- Distance to a radiant heat level of 5,000 BTU/hr-ft2)
- Distance to a flammable vapor cloud's lower flammability limit (LFL)
- Distance to a 2.5 psig overpressure level for the UVCE.

Estimate Potential Risk. Based on the results, the probability of a hazard footprint reaching the school will be calculated, as well as the fatality risk to students or staff attending the school. If the calculated fatality risk is less than one in a million (i.e., 1 x 10-6), the risk is not considered significant and no further risk

analysis is required. If the calculated risk is greater than one in a million, potential mitigation measures will be evaluated. In addition, population risk estimates will be calculated, as per the latest CDE protocol.

Estimate Potential Flooding. The potential for flooding associated with releases from the large diameter water pipeline will be evaluated in accordance with CDE guidelines. Although no specific criteria have been established by CDE as a threshold of significance for flooding at a school site, a water depth of 12 inches or greater is a trigger that warrants further evaluation.

The results of modeling efforts will be documented in a draft report that is signed and stamped by a California Registered Engineer.

TASK 2 - RAIL SAFETY STUDY

CDE requires a RSS to be conducted for all active rail lines within 1,500 feet of the school site. There is a single-track railroad easement operated by UP approximately 1,120 feet south the school site. The scope of work for the RSS is designed to identify rail lines located within a 1,500-foot radius of the proposed school site and to determine the actual or potential endangerment to school occupants from an incident (derailment or other accident) that could occur along the rail line.

The RSS will include the following tasks:

Collection of Existing Information. Based on interviews with regulatory agencies (Federal Railroad Administration) and railroad owners and operators, PlaceWorks will determine the following:

- Location and distance of rail lines to the school
- Track configuration (single or double, elevation, curvature, track conditions, switching equipment, signage and warning systems)
- Type, location, and characteristic of crossings (elevated, at grade, pedestrian or vehicle) and accident history for each crossing

In addition, PlaceWorks will conduct a brief site reconnaissance during typical school hours to confirm the following:

- Type of rail traffic on the lines (passenger, freight, or both)
- Average number of freight/passenger trains per day
- Number of engines and number of rail cars per train
- Types of cargo (hazardous vs. non-hazardous)
- Type of track (bolted or welded)
- Average speed of trains
- Number of at-grade crossings (requires horn blow)
- Condition of track, crossings, and evidence of trespass along the tracks
- Other potential safety issues

Documentation of the condition of the track and other relevant information will be provided in a photographic essay attached to the report.

Incident Analysis. Based on information collected previously, PlaceWorks will conduct an incident analysis to determine the probability that a student or faculty at the school could suffer an injury or fatality resulting from an incident or accident along the main rail line or spurs within a 1,500-foot radius of the

school. Statistics on accident data from the Federal Railroad Administration will be used to determine the probability of an incident or derailment per million train miles. Information obtained from the railroad owner/operator, site reconnaissance, and other sources will be used to develop site-specific probabilities of injury or fatality, given characteristics of the track, train speed, etc. Safety issues that drive the risk will be identified.

Additional Issues. In addition, PlaceWorks will identify all highway-rail crossings within a 1,500-foot radius of the school site, evaluate the adequacy of safety devices, determine past accident history at the crossings, and determine whether students would have to use these crossings to reach the school site, based on the school attendance area. The potential for noise and vibration related impacts from operation of the trains and the sounding of warning horns while approaching highway-rail crossings also will be evaluated with respect to the impact on outdoor and indoor noise levels at the school site.

Proposed Schedule

Once authorization to proceed is obtained, it typically takes four to five weeks to complete the draft reports. We will work to expedite the process, but it is dependent on receiving information from the pipeline agencies in a timely manner. After receiving comments on the draft report from the Jefferson School District, it will take approximately one week to prepare a final report incorporating any changes or comments.

Cost Estimate

Table 1 presents our cost estimate to prepare the Pipeline Safety Hazard Assessment and Table 2 presents the cost to prepare the Rail Risk study.

Task 1 – Pipeline Safety Hazard Assessment

TASK ELEMENT	UNIT	UNIT COST	NO. UNITS	COST
BURDENED LABOR COST				
Principal Engineer	Hour	$230	4	$920
Senior Engineer	Hour	$165	20	$3,300
Project Scientist	Hour	$105	6	$630
Graphic Artist I	Hour	$90	2	$180
Clerical	Hour	$75	1	$75
LABOR COST SUBTOTAL				$5,105
OTHER DIRECT COSTS				
Office Expenses				$50
OTHER DIRECT COSTS SUBTOTAL				$50
TOTAL ESTIMATED BUDGET				$5,155

Task 2 – Rail Risk Study

TASK ELEMENT	UNIT	UNIT COST	NO. UNITS	COST
BURDENED LABOR COST				
Principal Engineer	Hour	$230	4	$920
Senior Engineer	Hour	$165	12	$1,980
Project Scientist	Hour	$105	20	$2,100
Graphic Artist I	Hour	$90	2	$180
Clerical	Hour	$75	1	$75
LABOR COST SUBTOTAL				$5,255
OTHER DIRECT COSTS				
Office Expenses (including mileage)				$110
OTHER DIRECT COSTS SUBTOTAL				$110
TOTAL ESTIMATED BUDGET				$5,365

PlaceWorks – 2017 Standard Fee Schedule

STAFF LEVEL	HOURLY BILL RATE
Principal	$210-$325
Associate Principal	$190-$225
Senior Associate/Senior Scientist	$160-$200
Associate/Scientist	$120-$170
Project Planner/Project Scientist	$95-$125
Planner/Assistant Scientist	$85-$100
Graphics Specialist	$65-$135
Clerical/Word Processing	$45-$160
Intern	$65-$85

Subconsultants are billed at cost plus 10%.
Mileage reimbursement rate is the standard IRS-approved rate.

Acknowledgment

This proposal shall remain valid for a period of 90 days from the time of submittal. The attached Service Authorization, which includes our General Terms of Consulting Agreement, is a part of this proposal. If the contents of this Proposal and Agreement are satisfactory, please indicate your approval by signing the Service Authorization and sending it to our Corporate office. As Principal, I am authorized to bind PlaceWorks and the project team to the contents of this proposal.

We look forward to working with you to bring about the successful completion of this project. If you have any questions regarding the contents of this proposal, please feel free to contact the undersigned.

Respectfully submitted,

PLACEWORKS

Dwayne Mears, AICP
Principal

Steve Bush, PE
Senior Engineer