

**Historic Properties Survey Report
for Portions of the Richmond Field Station
Richmond, California**

June 2013

Prepared for:

University of California

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1. SUMMARY

Tetra Tech, Inc. conducted historical evaluations of the 25 buildings¹ in the proposed “Phase 1” area of the Richmond Field Station during January 2013 and of an additional 9 buildings in the area of potential effects (APE) in April 2013. Of these, 32 buildings were evaluated in terms of their eligibility for listing in the National Register of Historic Places (NRHP) and the California Register of Historical Resources (CRHR) and for their eligibility for listing as a historic district. Two of the buildings in the APE are not yet of historic age (45 years under CEQA and 50 years for the NRHP); so Tetra Tech recorded these buildings on DPR 523A forms, but did not evaluate them for historic significance. The evaluation was done in accordance with Section 106 of the National Historic Preservation Act and the implementing regulations found in 36 Code of Federal Regulations (CFR) Part 800, and in accordance with Section 15064.5(a)-(b) of the California Environmental Quality Act (CEQA) Guidelines applying the criteria outlined in Section 5024.1 of the California Public Resources Code. Tetra Tech, Inc. prepared this Historic Properties Survey Report (HPSR) to document the evaluation of the 25 buildings in the Phase 1 footprint and an additional 7 buildings in the larger APE.

This report does not include the study of pre-historic or historic archaeological resources in or near the project area; a separate cultural resource inventory report has been prepared to identify archaeological resources.

The results of the survey indicate that 32 of the 34 buildings do not meet the eligibility criteria for listing in the NRHP or the CRHR and should not be considered historic properties or historic resources either individually or as a historic district. Buildings 150 and 175 should be considered individually eligible for listing under NRHP Criterion A and CRHR Criterion 1 for their association with the California Cap Company and the period of explosives innovation and production in the East Bay. Although both buildings are associated with the California Cap Company, two buildings do not possess a concentration of buildings, structures, or objects sufficient to constitute a historic district.

¹ These buildings are within a parcel proposed for development. There are an additional 59 buildings at the Richmond Field Station, some of which are of historic age and may be eligible for listing in the National Register of Historic Place or the California Register of Historical Resources.

2. PROJECT DESCRIPTION

2.1 PROJECT LOCATION

The Richmond Field Station is adjacent to San Francisco Bay in the City of Richmond in Contra Costa County (Figure 1). The project area is in the southern portion of the Richmond Field Station (Figure 2).

2.2 PROPOSED PROJECT ACTIVITIES

The US Department of Energy (DOE) proposes to relocate and consolidate some of its off-site Lawrence Berkeley National Laboratory (LBNL) research activities to a new 110,000 to 150,000 gross-square-foot facility that DOE would construct on the 16-acre Phase 1 portion of the Richmond Field Station. DOE may also choose to occupy additional facilities that may be constructed by others at approximately the same time as the DOE building construction. Construction would occur over 4 years from 2014-2018.

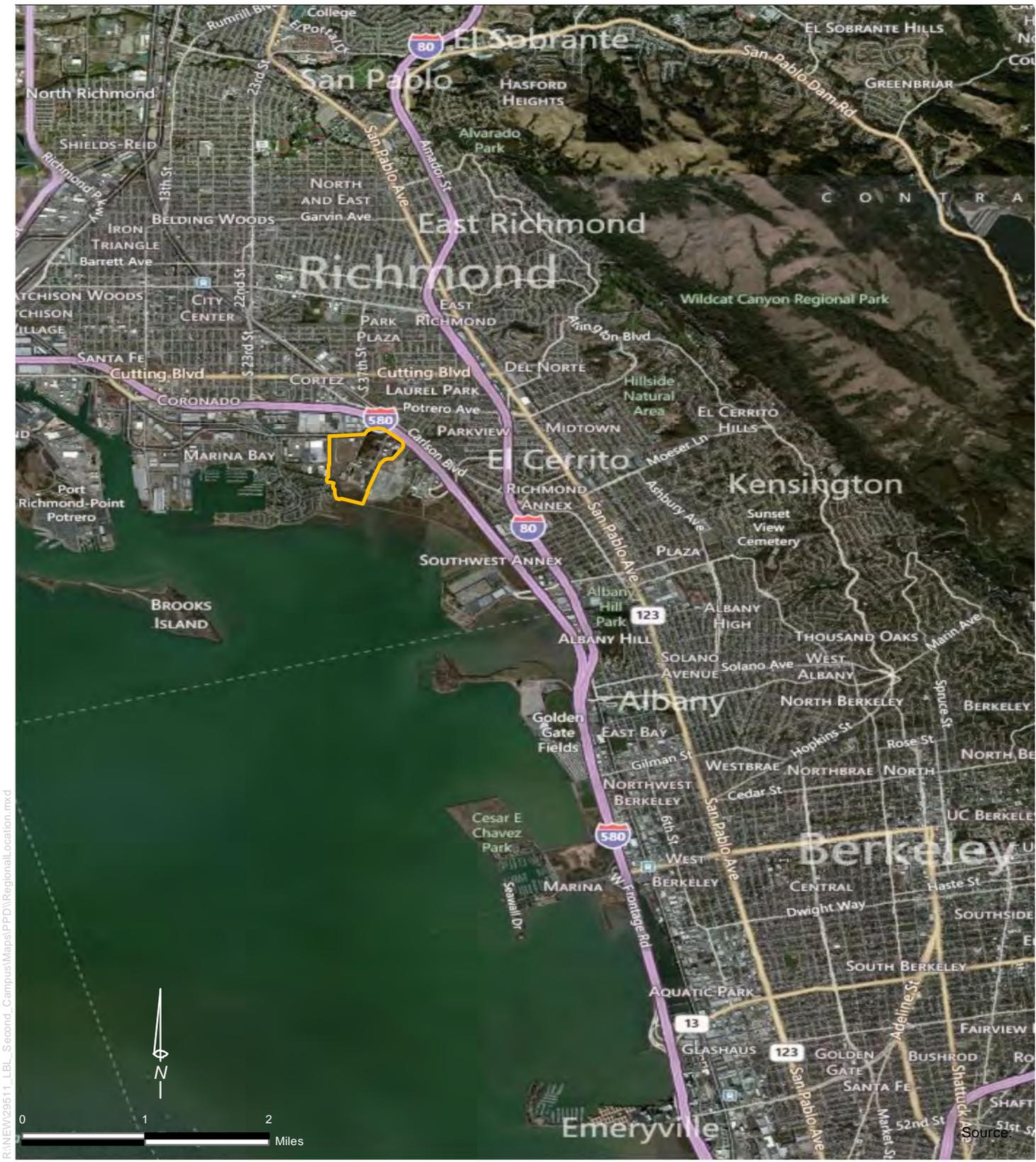
Once constructed, research at these new facilities would initially focus on cleaner biofuel development processes; an advanced understanding of the genomics of plants, microbes, and microbial communities; production of non-petroleum based essential materials and chemicals; advanced diagnostic equipment and techniques for bioscience; industrial process development; and cancer research. Existing research programs at the Richmond Field Station in sustainable transportation and earthquake engineering, among others, would continue.

Prior to construction, the 25 existing structures in the Phase 1 area, totaling approximately 107,000 gross square feet (gsf), would be demolished. Construction activities would include rerouting utilities, demolishing buildings, removing trees, landscaping, earthwork, installing utilities and stormwater infrastructure, constructing roads and parking lots, and constructing three new facilities totaling approximately 600,000 gsf. These buildings would include one three-story facility with 110,000 to 150,000 gsf, one two-story facility with 110,000 to 150,000 gsf, and one three- to four-story facility with up to 300,000 gsf.

2.3 RESEARCH METHOD

On January 4, 2013, Tetra Tech Historians/Architectural Historians inventoried and photographed the 25 buildings that are in the Phase 1 footprint. Tetra Tech researched specific buildings and the land use history of the Richmond Field Station at several repositories including the Contra Costa Historical Society archive, the Doe Memorial Library, the Earth Sciences and Map Library at UC Berkeley, and the Oakland Public Library's Oakland History Room.

On April 30, Tetra Tech's Historians/Architectural Historians inventoried and photographed the nine APE buildings across Lark Drive from the 25 buildings



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Regional Location

Legend

Richmond Field Station

Richmond, California



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Project Area

Richmond, California

 Project Area

mentioned above. Seven of the nine buildings were recorded and evaluated for their historic significance. Two of the buildings, Buildings 198 and 201, have modern construction dates and were not evaluated for their historic significance.

Tetra Tech identified and prepared a historic context and identified themes under which each of the buildings would be evaluated under the CRHR and NRHP criteria on California Department of Parks and Recreation (DPR) 523 forms; the latter criteria applied because properties listed on or eligible for listing in the NRHP are automatically eligible for listing in the CRHR.

2.4 PAST HISTORIC EVALUATIONS

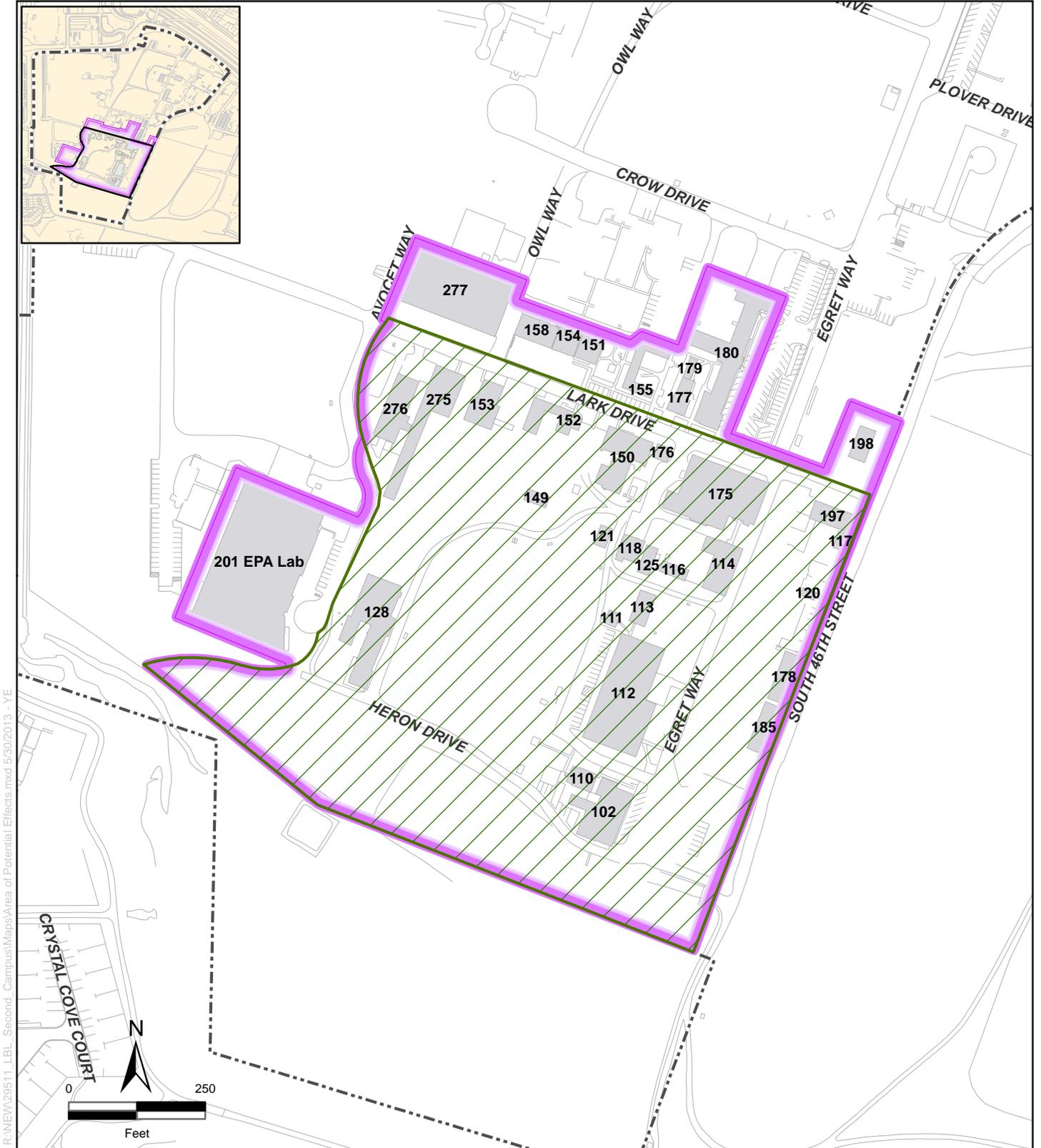
The Contra Costa County Historic Resources Inventory of 1976, updated in 1989 and 2010, lists the “California Cap Works” at 33rd Avenue and Hoffman Boulevard in Richmond as a structure of merit. This address is not within the “Phase 1” footprint, and the address and listing do not specify which building or structure at this address is included in the inventory. Contra Costa County Historical Landmarks Committee and the City of Richmond Planning Division staff explained that this inventory was conducted by local historical societies in 1976 to determine important local historical places, but that no formal evaluations were conducted for the California Cap Works buildings at 33rd Avenue and Hoffman Boulevard.² Listing in this inventory does not prescribe any protection to the buildings and structures listed and does not qualify them as historical resources included in a local register of historical resources, as defined in subsection 5020.1(k) of the Public Resources Code.

Holman and Associates surveyed the Richmond Field Station for cultural resources in 1989 as part of an Environmental Impact Report (Holman and Moser 1991). The boundaries for the Holman and Associates survey differed from the boundaries prescribed for this survey and Holman and Moser did not evaluate all the buildings in the current survey population using NRHP or CRHR criteria. The report simply identified that, at that time, the two buildings were over 50 years old.

2.5 AREA OF POTENTIAL EFFECTS

DOE, with assistance from Tetra Tech, established the direct APE (the area that would be directly impacted by proposed project activities) as the 16-acre project area that includes the 25 buildings to be demolished. The direct APE is bounded by South 46th Street, along Lark Drive, Avocet Way, and Heron Drive, as shown in Figure 3. The indirect APE includes the nine buildings to the north and northeast of Lark Drive and the EPA Laboratory building (Building 201) on Avocet Way. The proposed project could have indirect effects on these buildings.

² Christine Louie, Contra Costa County Historical Landmarks Committee personal communication with Kara Brunzell, Tetra Tech, Inc. March 11, 2013; Hector Rojas, City of Richmond Planning Division, personal communication with Kara Brunzell, Tetra Tech, Inc. March 11, 2013.



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Historical Architectural Area of Potential Effects

Richmond, California

-  DirectAreaPotentialEffects
-  Indirect Area of Potential Effects
-  Richmond Field Station Boundary
-  Road or Other Landscape Feature
-  Buildings



Figure 3

Because Building 198 (constructed in 1981) and Building 201 (constructed in 1992) have not yet reached the 45-year (CRHR listing) or 50-year (NRHP listing) recommended age for eligibility, they were not evaluated for historic significance, but were recorded on DPR 523 A forms. Figure 3 shows the entire APE for historical architectural resources for the project. Table 1 lists the buildings in the direct APE, and those within the indirect APE are presented in Table 2.

Table 1
Buildings in the Direct APE

Building Number	Year Built	NRHP or CRHR Eligibility Finding
102	circa 1860	ineligible
110	circa 1910s	ineligible
111	1987	ineligible
112	1964	ineligible
113	1982	ineligible
114	circa 1930	ineligible
116	unknown	ineligible
117	unknown	ineligible
118	circa 1930s	ineligible
120	1967	ineligible
121	1982	ineligible
125	circa 1930	ineligible
128	circa 1930	ineligible
149	1982	ineligible
150	circa 1910	eligible
152	circa 1930s	ineligible
153	1959	ineligible
163	circa 1930/1963	ineligible
175	circa 1910	eligible
176	circa 1930s	ineligible
178	unknown	ineligible
185	unknown	ineligible
197	1975	ineligible
275	1956	ineligible
276	1956	ineligible

Table 2
Buildings in the Indirect APE

Building Number	Year Built	NRHP or CRHR Eligibility Finding
151	1961	ineligible
154	1958	ineligible
155	1953	ineligible
158	circa 1957	ineligible
177	circa 1920	ineligible
180	circa 1920	ineligible
198*	1981	ineligible
201*	1992	ineligible
277	1966	ineligible

*Buildings 198 and 201 are in the indirect APE but were not of historic age (45 years or older) at the time of the survey.

3. SURVEY POPULATION

3.1 DESCRIPTION OF THE BUILDINGS IN THE PHASE 1 FOOTPRINT (DIRECT APE)

3.1.1 Building 102

Building 102 is near the southern edge of the Richmond Field Station campus at the intersection of Heron Drive and Egret Way with its primary façade facing southeast. The 6,737 square-foot building is single story with an irregular plan. It was constructed circa 1860 and is currently used for research. The building has been altered since its original construction.

Building 102 was originally a produce warehouse with a rectangular plan at the corner of Heron Drive and Egret Way. When the Tonite Powder and California Cap companies were constructed along the waterfront in 1877, the warehouse was a crucial safety barrier between explosive powder and detonators. Agriculture continued to be an important local activity after the establishment of the explosive companies, and through the 1880s produce was stored in Building 102, along with explosives.³ As the Tonite and California Cap Companies grew, less space was used for agricultural items, and the building was used entirely for California Cap Company products. By 1912, the company had its can factory and its warehouse in the building.⁴ The California Cap Company labeled the building as Building 30. The California Cap Company constructed additional space on the northwest side of the building during the 1930s. During World War II, the building housed an assembly line for incendiary delayed-action bombs.⁵

After UC Berkeley's Department of Engineering took over the site in 1950, the Sanitary Engineering Research Laboratory (SERL) centered activities in and around the building and relabeled the Building 102. Professor H.B. Gotaas was in charge of SERL research during the early 1950s. Projects in the building included studies on composting, incineration, water reclamation, algae symbiosis, saltwater intrusion, and radioactive waste disposal.⁶ Building 102 also housed SERL's library and administrative offices. The Department of Engineering altered the interior of the building to suit its purposes, and by the mid-1950s it housed "an unusually well-equipped chemistry and biology laboratory".⁷

Historic photographs indicate that the original building was side gabled, with its primary façade on Egret Way. The University made additions on the building four times after 1950, including construction of an addition projecting from the primary façade that has since been removed.⁸ Alterations to the façade appear to have been made during the 1970s, when a flat roof replaced the original gabled roof over the

³ Roland Oliver, "Recollections of Early Industries in Stege," August 7, 1959, p. 1.

⁴ Sanborn Insurance Maps, Stege, California. 1912.

⁵ Oliver, p. 1.

⁶ University of California, Berkeley, Department of Engineering, "Richmond Field Station Open House," May 28, 1952, p. 1.

⁷ University of California, Berkeley, Department of Engineering, "Guide for Engineering Field Station Inspection," undated, p. 7.

⁸ Shackleton, 2013.

3. Survey Population

southeast wing of the building (Photographs 1 and 2). Facades on Egret and Heron Drive were altered with the replacement of stucco siding instead of wood. Windows are aluminum sashes. In 2013, the building uses include storage, a bioengineering office, and wet chemistry laboratory.



Photograph 1: Building 102, circa 1954, camera facing west.
On file at the Richmond Field Station archives



Photograph 2: Building 102, circa 1970, camera facing west.
On file at the Richmond Field Station archives

The majority of the building is topped with a flat roof, while other elements of the building's rear are topped with shed roofs. The main (southeast) façade features a broad eave overhang with large exposed roof rafters. There are several large plain columns along this elevation. Many of these columns show signs of moderate to severe deterioration. The building's walls are sided with stucco with wood trim and with horizontal wood siding. Fenestration is aluminum sliding sashes and double-hung, multi-light, wood-frame sashes. Three entrances on the primary elevation are at grade through metal swinging doors; two have windows. Another elevation features a wood paneled door with a window.



Photograph 3: Building 102
January 4, 2013, camera facing southwest

The building currently reflects the many changes of use and alterations performed over the years in its irregular footprint and multiple types of siding and fenestration (Photographs 4 and 5).



Photograph 4: Building 102, January 4, 2013, camera facing north



Photograph 5: Building 102, January 4, 2013, camera facing southwest

3.1.2 Building 110

Building 110 is near the southern edge of Richmond Field Station campus adjacent to Building 102 (Photograph 6). The vernacular building does not strongly express a particular architecture style. Constructed circa the 1910s, the building is 1,325 square feet, single story, with a rectangular plan and topped by a shallow pitch, front gabled roof. Its primary elevation faces southeast. Its moderate eaves feature exposed rafter tails on its northeast and southwest elevations. The walls are clad in horizontal wood siding. Fenestration is original, multi-light, double-hung, wood sashes. An original paneled wood entry door is centered in the southwest elevation, sheltered by a recessed entry porch and accessed by a set of wooden stairs. Plain entablature adorns the door and windows surrounding the otherwise unornamented building. An addition at the rear (northwest) of the building is topped by a shed roof. Its rear entrance is a wood paneled door with a window. This door is sheltered by a small awning and accessed by a set of wooden stairs. The building is surrounded by grassy areas, and access to the rear of the building is currently blocked by a wood fence to the south and a chain link fence to the north.

Building 110 was constructed by the California Cap Company circa the 1910s. The building was originally several hundred yards to the northeast of its current location, along Egret Way.⁹ It was used as a research laboratory by the California Cap Company and labeled Building 65.¹⁰

After UC Berkeley's SERL took over the site in 1950, its activities were concentrated in the southeast section of the Richmond Field Station. Historic aerial photographs show that Building 110 was moved to its current location adjacent to Building 102 circa 1960 and was used for research using radioisotopes.¹¹ After it was moved, Building 110 housed laboratories and offices for SERL's successor, (EEHSL).¹² The building continued to be used for offices until 2008, but it is currently vacant.¹³

⁹ University of California, Berkeley, "Draft Environmental Impact Report, Proposed U.S. Environmental Protection Agency, Region IX Laboratory at the University of California's Richmond Field Station," Prepared by University of California, Berkeley Planning, Design and Construction Department, July 1991, p. 307.

¹⁰ University of California, Berkeley, 2008, p.

¹¹ P.H. McGauhey, "The Sanitary Engineering Research Laboratory: Administration, Research and Consultation, 1950-1975 – An Interview Conducted by Malca Call," Regional Oral History Office, University of California, Berkeley, 1974, p. 71.

¹² Shackelton, 2013.

¹³ University of California, Berkeley, 2008, p. 196.



Photograph 6: Building 110, January 4, 2013, camera facing south

3.1.3 Building 111

Building 111 is in the southern portion of the Richmond Field Station (Photograph 7). The utilitarian building does not express any particular architectural style. It is 507 square feet and was constructed in 1987. It is single story and rectangular in plan. The building is topped by a flat roof and constructed of concrete masonry units. It lacks fenestration, and its entrances are industrial-type metal doors on its northwest and southeast elevations.

Building 111 appears to have been constructed by UC Berkeley in 1987 on the site of an older building.¹⁴ The land was the location of a storage shed for the California Cap Company “Building 148,” that was removed prior to the construction of Building 111 that was constructed for hazardous materials storage.¹⁵ The Watershed Project, a non-profit group whose offices are at the Richmond Field Station, has used the building for storage for the past several years.¹⁶ The building is not of a historic age, as it was constructed 26 years ago.

¹⁴ University of California, Berkeley, 2008, p. 196.

¹⁵ University of California, Berkeley, 2008, p. 13.

¹⁶ Shackleton, 2013.



Photograph 7: Building 111, January 4, 2013, camera facing northeast

3.1.4 Building 112

Building 112 is in the southern portion of the Richmond Field Station (Photograph 8). The rectangular, single-story, 16,949 square-foot building was constructed in 1964.

The building is topped with a flat roof. Its southeast (primary) and northwest (rear) elevations feature a broad eave overhang with large exposed roof rafters. The roof is supported by large plain columns. The walls are sided in stucco with wood trim. Primary fenestration is fixed and awning metal sashes, with vinyl replacement windows at the rear elevation. The primary entrance is a recessed glazed door with a transom and surround.

The building features landscaped areas in the front southeast side elevation that include mature trees along Egret Way. It is identified as the Center for Tissue Bioengineering. A small parking area is adjacent to its rear (northwest) elevation.

Building 112 was constructed in 1964 on the site of seven former California Cap Company buildings.¹⁷ It is in the southeastern portion of the Richmond Field Station, where the early SERL activities were centered. The large building originally housed offices, classrooms, and laboratories.¹⁸ It housed a wet chemistry laboratory as late as 2008, though at that time it was being phased out.¹⁹ It is currently devoted to bioengineering and public health offices.²⁰

¹⁷ University of California, Berkeley, 2008, p. 149.

¹⁸ University of California, Berkeley, 2008, p. 13.

¹⁹ University of California, Berkeley, 2008, p. 25.

²⁰ Shackleton, 2013.



Photograph 8, Building 112, January 4, 2013, camera facing north

3.1.5 Building 113

Building 113 is in the southern portion of the Richmond Field Station. It is a 1,800 square-foot prefabricated building, constructed in 1982 (Photograph 9). It is single story and rectangular in plan.

The building is topped with a very shallow pitched gable roof with large vents in the gables. Its walls are corrugated steel and lack fenestration. An industrial metal entrance door is centered in its southwest elevation and its northwest elevation features a large roll-up door. The building has large vents in the walls near the ground. It is surrounded by a grassy area and shrubbery.

Building 113 was constructed in 1982 as a storage and support facility for SERL. The prefabricated steel building was assembled by Richmond Field Station maintenance workers, who also built its slab foundation.²¹ Its use has continued unaltered. The building is 31 years old.

²¹ University of California, Berkeley, File "Building 113," located in vertical files in Room 148, Richmond Field Station.



Photograph 9, Building 113, January 4, 2013, camera facing southeast

3.1.6 Building 114

Building 114 is in the southern portion of the Richmond Field Station on the west side of Egret Road (Photograph 10). Its primary façade faces northeast; it is an L-shaped, single story, with a one-and-one-half story wing, 4,523 square-foot building constructed circa 1930.

The one-and-one-half story building is topped with a front gabled roof that ties into a shed roof section at its southeast elevation. Rafter tails and purlins are exposed at the eaves. The walls and roof are of corrugated metal. Most of the fenestration is multi-light, fixed, wood sashes. The main entrance, centered in the northeast elevation, has a wood paneled and replacement industrial door, both with windows. There is a large sliding door at the east end of the elevation. The doors are accessed by a concrete loading dock that has a set of wooden stairs in front of the main entrance.

A single story, shed roof addition projects from the northwest end of the building. It features a large sliding door that faces northeast. Building 114, originally labeled “Building 81” was constructed circa 1930 by the California Cap Company or the Pacific Cartridge Company. It was adjacent to the Pacific Cartridge Company’s factory and was a warehouse for the cartridges produced there. The original building was rectangular in plan, oriented along Heron Drive. After UC Berkeley purchased the property in 1950, it used the warehouse to store building materials for use in building maintenance on the property.²² Aerial photographs show that the University constructed an addition at the northwest end of the building circa 1955. The building is currently used for the storage of building materials.

²² Shackleton, 2013.



Photograph 10: Building 114, January 4, 2013, camera facing west

3.1.7 Building 116

Building 116 is in the southern portion of the Richmond Field Station (Photograph 11). It is 967 square feet and was moved to its present location in 1964. The single story building is a rectangular, Butler Company prefabricated building topped with a front gabled roof. The walls and roof are corrugated metal. Fenestration is multi-light, fixed metal sashes, some of which are wire sashes. The entrance at the south end of the southeast elevation is a paneled wood door with a window.

Building 116 was originally constructed on the UC Berkeley campus by the US Air Force. Its original construction date is unknown, but by 1961 it had outlived its purpose and the UC Regents decided to raze it. SERL had the building relocated to the Richmond Field Station at the end of 1961.²³ It has been used throughout its lifetime as a support and storage area.

²³ University of California, Berkeley, File "Building 116," located in vertical files in Room 148, Richmond Field Station.



Photograph 11: Building 116, January 4, 2013, camera facing west

3.1.8 Building 117

Building 117 is along the southeastern border of the Richmond Field Station (Photograph 12). It is a single story and rectangular in plan.

The building is topped with a front gabled roof that has exposed wood rafter tails and purlins at the eaves. The walls and roof are corrugated metal. Fenestration is fixed wood sashes. The entrance at the north end of the northwest elevation is double paneled wood doors with windows.

Building 117's construction date is unknown. Aerial photographs show it was moved to its present location circa 1990. Its materials indicate that it was constructed prior to 1950 during the California Cap Company era, but research failed to reveal its original use and location. It was used as a maintenance shop in the 1990s and is currently used for storage and support.²⁴

²⁴ University of California, Berkeley, 2008, p. 196.



Photograph 12: Building 117, January 4, 2013, camera facing east

3.1.9 Building 118

Building 118 is in the southern portion of the Richmond Field Station (Photograph 13). It is west of Egret Way and adjacent to Building 125 with its primary façade facing northeast. The utilitarian building does not express any particular architectural style. It is 1,708 square feet and was constructed prior to 1940. It is a single story building with a rectangular plan.

The building is topped with a very shallow pitched roof with minimal eave overhang. The walls are clad in roof paper. Fenestration is a single multi-light, fixed wood sash adjacent to the primary entrance, and a single aluminum sliding sash at the rear (southwest) elevation. The primary entrance, at the east end of the northeast elevation, is a wood paneled door with a window. A large metal roll up door is centered in the façade.

The secondary entrance is sliding doors at the south end of the northwest elevation. A low shed roofed addition at the rear corner of the building has another wood paneled door, and a southwest facing window.

Building 118, originally labeled “Building 149,” was constructed circa the 1930s by the California Cap Company. The building was constructed to house the fuel oil boiler for the plant. After UC Berkeley purchased the property in 1950, the building was used as a fire test research area and maintenance shop. Fire safety research studies were done at Richmond Field Station to determine the safety of a variety of products including plastics and airplane restrooms.²⁵ Building 118 also housed the plumbing shop for the Richmond Field Station until 2009. It is currently used as an art facility for graduate

²⁵ University of California, Berkeley, 2008, p. 14.

students.²⁶ The wood siding has been covered with roof paper. A small addition at the southwest corner was constructed in the modern period. Dates for these alterations are unknown.



Photograph 13: Building 118, January 4, 2013, camera facing southwest

3.1.10 Building 120

Building 120 is along the southeastern border of the Richmond Field Station (Photograph 14). It is set back from Egret Way adjacent to building 117. The utilitarian building does not express any architectural style. It is 269 square feet and was constructed in 1967. It is single story and rectangular in plan.

The building is topped with a shed roof. The walls and roof are corrugated metal, and the building lacks fenestration. The only entrances to the building are large openings on its northeast elevation that are covered with a metal construction fence.

This building was constructed in 1967. During the 1960s and 1970s, an incinerator burned garbage at this location.²⁷ Aerial photographs show that Building 120 was moved to its present location circa 1990. Research failed to reveal the building's original location. It was used as a solvent storage shed in the 1990s. Currently, drums containing waste petroleum products are stored in the building.²⁸

²⁶ Shackleton, 2013.

²⁷ Shackleton, 2013.

²⁸ University of California, Berkeley, 2008, p. 28.



Photograph 14: Building 120, January 4, 2013, camera facing south

3.1.11 Building 121

Building 121 is in the southern portion of the Richmond Field Station (Photograph 15). The utilitarian building does not express any architectural style. It is 728 square feet and was constructed in 1982. It is single story and rectangular in plan.

The building is topped with a front gabled, fiberglass roof, with exposed rafter tails at the eaves. The walls are corrugated metal. It lacks fenestration. The only opening is a roll up garage door on the northeast elevation.

Building 121 was constructed circa 1970, as shown by aerial photographs. It was constructed as a garage for the storage of lawn equipment. The roll up garage door was added at an unknown date. The UC Berkeley Solar Powered Vehicle Club began using it for storage circa 2009.²⁹

²⁹ Shackleton, 2013.



Photograph 15: Building 121, January 4, 2013, camera facing west

3.1.12 Building 125

Building 125 is in the southern portion of the Richmond Field Station (Photograph 16). It is west of Egret Way and between Building 116 and Building 118 with its primary façade facing northeast. The vernacular building does not express any particular architectural style. It is 1,024 square feet and was constructed prior to 1940. It is single story and rectangular in plan.

The building is topped with a front gabled roof, and purlins are exposed at the minimal eaves on the front (northeast) and rear (southwest) elevations. Both gables are adorned with simple, decorative, stickwork trusses. The walls and roof are corrugated metal. Fenestration throughout the building is multi-light, wood sashes. The wide primary entrance is fitted with a flush door and reached by a wooden ramp leading to a small deck at the front of the building. The rear (southwest) door is flush, and accessed by a set of wooden steps.

Building 125, originally labeled “Building 24,” was constructed circa 1930 by the California Cap Company. It was adjacent to the plant’s mercury fulminate production facility (near Building 102) and was used as an alcohol warehouse. After UC Berkeley purchased the property in 1950, the building was used as a composting facility.³⁰ During the 1960s SERL used the building for a laboratory and shop. It was moved to its current location as part of an environmental remediation project in 1998. It is currently used as a bioengineering research facility.³¹

³⁰ University of California, Berkeley, 2008, p. 196.

³¹ Shackleton, 2013.



Photograph 17: Building 125, January 4, 2013, camera facing west

3.1.13 Building 128

Building 128 is in the southwestern portion of the Richmond Field Station, along Heron Drive, adjacent to the Environmental Protection Agency building (Photographs 18 and 19). The vernacular building does not clearly express any particular architectural style. It is 10,287 square feet, constructed circa 1930, single story, and has an irregular plan.

The building is topped with a shallow, pitched, side-gabled roof. The primary façade, that faces southeast, features a partial width entry porch and several projecting bays. The building walls are sided in horizontal wood siding. Fenestration is a combination of original, multi-light wood and replacement aluminum sashes. A paneled entry door with windows is accessed by wooden stairs that lead to the porch. At the rear of this section of the building, are seven bays separated by poured concrete walls that project past the walls and above the roof. There are two rectangular plan sections at the northwest end of the primary wing. The smaller section, at the west end of the building, is topped with a shed roof. The larger section, to the north, has a very shallow, pitched, gabled roof. Both sections are accessed by large replacement roll up doors at their southwest ends.

Building 128, originally labeled “Building 4b,” was constructed circa 1930 by the California Cap Company.³² The original building consisted of what is today the southeast wing of the building and was used as a press house. The press house was where gunpowder was compressed into cakes using weights. There were several other small buildings in the vicinity that were also press houses. The heavy concrete walls at the rear of the original building are reinforced concrete blast walls, intended to limit damage in case of explosion. After UC Berkeley purchased the property in the 1950s, the University added two warehouse additions to the building. The first was the

³² University of California, Berkeley, 2008, p. 199.

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northwest section of the building, built circa 1950.³³ The smaller west section was added in 1974.³⁴ The building housed internal combustion laboratories and was used for detonation research. Rocket engine tests using model rockets were among the modes of research conducted in Building 128.³⁵ By 1980, Building 128 was altered to its current irregular footprint. During the 1980s, large machinery was installed for research into automated recycling.³⁶ The building is currently used as a research facility.



Photograph 18: Building 128, January 4, 2013 camera facing northeast



Photograph 19: Building 128, January 4, 2013, camera facing northeast

³³ Shackleton, 2013.

³⁴ University of California, Berkeley, File "Building 128," located in vertical files in Room 148, Richmond Field Station.

³⁵ University of California, Berkeley, File "Building 128," located in vertical files in Room 148, Richmond Field Station.

³⁶ Shackleton, 2013.

3.1.14 Building 149

Building 149 is in the southern portion of the Richmond Field Station (Photograph 20). Its primary façade faces southeast; it is 720 square feet and was constructed in 1982. It is single story and rectangular in plan.

The building is topped with a front gabled roof, with shallow eaves and exposed rafters on the southwest and northeast elevations. The building is clad in plain and vertical groove plywood. Fenestration is vinyl sashes. The primary entrance, on the southeast elevation, is a flush, at-grade door. A similar door is near the rear of the southwest elevation. The southeast elevation features a flush double door.

Building 149 was constructed by UC Berkeley in 1982. Originally, it was used for water technology research. It has also been used for solar research. Between 1992 and 1998, it was used as hang glider storage. It is currently being used by the UC Berkeley Concrete Canoe Club.³⁷ It is not of historic age, as it was constructed 31 years ago.



Photograph 20: Building 149, January 4, 2013, camera facing north

3.1.15 Building 150

Building 150 is in the southern portion of the Richmond Field Station (Photograph 21). Its primary façade faces northeast along Lark Drive. It is 5,410 square feet and was constructed in approximately 1910.

³⁷ Shackleton, 2013.



Photograph 21: Building 150, January 4, 2013, camera facing south

The building is single story and rectangular in plan, with additions to the rear (southwest) side. The building is topped with a shallow-pitched, side gabled roof with shallow eaves and exposed shaped wood rafter tails and purlins. Many of the original features remain and the building continues to convey original use as a shop with its sets of industrial, metal-frame, multi-light sashes, walls sided in board formed concrete, and low, open configuration.

The main entrance is centered in the primary elevation and features original flush wood double doors with multi-light windows and transoms. A concrete loading dock in front of these doors is accessed by a set of wooden stairs at its east end and a ramp at its west end.

The northwest elevation features a large roll up metal door. The rear (southwest) elevation of the building lacks the overhanging eaves with their decorative rafter tails that are found on the front and sides of the building. Fenestration at the rear is original, metal-frame, multi-light, industrial sashes.

A separate rectangular-plan addition is perpendicular to the main section of the building, at its rear (Photograph 22). It was added in 1946. This addition is topped with a shallow, pitched, gabled roof lower than the main building's roof with an eave overhang and rafter tail treatment mimicking that of the street-facing façade. Fenestration on this addition is multi-light, hung, wood sashes. A flush-mounted wood door is the entrance on the southwest elevation. It is sheltered by a shed roofed awning and accessed by a wooden staircase. An addition on the northwest side of the rear building has an even lower shed roof. The walls are clad in corrugated metal. Fenestration at this addition is horizontal sliding sashes, and the entrance is a large wood sliding door.



Photograph 22: Building 150, January 4, 2013, camera facing northwest

The California Cap Company constructed Building 150 circa 1910. The building was known as “Building 66a” and used for wire insulating. The addition at the southeast end of the building, known as “Building 66,” was also constructed during the California Cap Company era. Aerial photographs show that it had been constructed by 1946. It was used for wire saturating.³⁸ Insulated wires were an essential element of the fuse-type blasting caps manufactured by the California Cap Company. Wire saturating was one step in the process of manufacturing insulated wire.

After UC Berkeley purchased the property in 1950, the Division of Mechanical Engineering was housed in Building 150. During the 1950s, Associate Dean E. D. Howe supervised Fluid Mechanics Test Facilities in the building.³⁹ Over the years the building was used as a petroleum studies facility, a machine shop, and a laboratory for UCSF.⁴⁰ Building 150 is currently used as a student art facility.

3.1.16 Building 152

Building 152 is in the southern portion of the Richmond Field Station (Photograph 23). It is on the south side of Lark Drive adjacent to Building 150, with its primary façade facing northeast. The vernacular building does not strongly express any particular architecture style. It is two stories and has an irregular plan, is 4,201 square feet, and was constructed prior to 1940.

³⁸ Sanborn Map, Richmond, 1949.

³⁹ University of California, Berkeley, Department of Engineering, “Guide for Engineering Field Station Inspection,” undated, p.2.

⁴⁰ University of California, Berkeley, 2008, p. 196.

The building consists of two front gabled wings facing the street, joined by a wing that runs parallel to the street. The roof is sheathed in composition shingles. The building is clad in a combination of horizontal wood, vertical board-and-batten, and asbestos siding. Fenestration also varies, and includes vinyl replacement windows and multi-light, double hung wood sashes. An entrance at the east gable is fitted with a flush wood door and accessed by a wood deck with stairs at one end and a ramp at the other. A similar entrance at the west gable is accessed by a concrete loading dock and stairs. A single story addition at the northwest end of the building features a hipped roof covered in corrugated metal. Multi-light, fixed, wood sashes have been painted over on its southeast elevation. The entrance at the northeast elevation is a large wood sliding door with a wood paneled door adjacent to it.

A rear entrance is toward the southwest corner of the west gable, facing the inside of the “U” formed by the building’s wings. It is a flush mounted wood door that is accessed via a set of wooden stairs. The west gable is several feet longer than the east gable at the rear of the building. A small gable roofed shed is to the rear of the building adjacent to its southeast corner.

Building 152 was constructed by the California Cap Company circa the 1930s. It was originally three connected buildings referred to as “Building 59,” Building 60,” and “Building 142”. Wooden boxes were assembled and other carpentry tasks performed in “Building 59,” while “Building 60” was the packing house. “Building 142” was for sawdust storage and a restroom.⁴¹ After UC Berkeley purchased the property in 1950 the building was used for salt water research and storage. A Mineral Dressing laboratory was installed by the Department of Mineral Technology in the late 1950s, but it appears not to have been used.⁴² By 1980 the building was being used primarily for storage.⁴³ In the 1990s Building 152 began to house graduate student Art Practice, the current use of the building.⁴⁴

⁴¹ University of California, Berkeley, 2008, p. 200, 202.

⁴² University of California, Berkeley, File “Building 152,” located in vertical files in Room 148, Richmond Field Station.

⁴³ University of California, Berkeley, File “Building 152,” located in vertical files in Room 148, Richmond Field Station.

⁴⁴ Shackleton, 2013.



Photograph 23: Building 152, January 4, 2013, camera facing west

3.1.17 Building 153

Building 153 is in the southern portion of the Richmond Field Station. It is on the south side of Lark Drive adjacent to Building 152, with its primary façade facing northeast (Photograph 24). The vernacular building does not strongly express any particular architecture style. It is single story and rectangular in plan, 2,731 square feet, and was constructed in 1959.

The front section of the building is flat roofed. The walls are covered in stucco, and fenestration is multi-light fixed sashes. The northeast elevation lacks fenestration, but has two entry doors and two large swinging double doors. All doors are wood paneled with windows. A rear addition to the building is topped with both a flat roof and a shed roof section. An entrance at the rear of the southeast elevation is a large sliding door.

Building 153 was constructed by UC Berkeley in 1959. It was used as a modeling shop and for salt water research.⁴⁵ The Naval Architecture Department used the building for ship design over the years.⁴⁶ In 1958, the department of Nuclear Engineering was looking for space for gamma-shielding experiments, and may have moved into Building 153 for a time.⁴⁷ Aerial photography indicates that the addition at the rear (southeast) of the building was constructed in approximately 1975. It is currently used as a research facility and a shop.

⁴⁵ University of California, Berkeley, 2008, p. 196.

⁴⁶ Shackleton, 2013.

⁴⁷ University of California, Berkeley, File "Building 153," located in vertical files in Room 148, Richmond Field Station.



Photograph 25: Building 153, January 4, 2013, camera facing west

3.1.18 Building 163

Building 163 is at the southeastern edge of the Richmond Field Station (Photograph 26). The primary façades of this L-shaped building face northwest and southwest. The vernacular building does not strongly express any particular architecture style. It is single story and 6,430 square feet. The building was constructed prior to 1940.

Both wings of the building have front gabled roofs covered with composition shingles. The walls are clad in horizontal wood siding; a portion of the walls is covered with stucco. Fenestration is aluminum replacement sashes. The primary entrance is a paneled, southeast-facing, wood door. It is accessed by a concrete ramp. Other entrances are centered in each gable end and are flush wood doors. The northwest entrance is accessed by concrete steps. The southwest entrance is accessed by a set of wooden steps and sheltered by a shed roof over the entry. There is a similar entrance on the rear (southeast) elevation.

Building 163 was created when two buildings were pieced together at this location in 1996. It is two California Cap Company buildings originally constructed circa 1930. They were connected with a new section at the corner of the “L” to create Building 163. Its site overlaps with the footprint of the U.S. Briquette Company plant and William Letts Oliver’s American Lucol Company. Aerial photographs indicate that the U.S. Briquette buildings were demolished circa the 1960s after UC Berkeley took over the site. Ergonomic studies, seeking to prevent chronic disorders of the upper extremities, have been conducted in the building since the 1990s.⁴⁸ Building 163 houses offices and continues to be used as a research facility.

⁴⁸ Shackleton, 2013.



Photograph 26: Building 163, January 4, 2013, camera facing east

3.1.19 Building 175

Building 175 is in the southern portion of the Richmond Field Station at the intersection of Lark Drive and Egret Way (Photograph 27). Its primary façade faces northeast along Lark Drive. It is 16,502 square feet and was constructed in approximately 1910.

The building is single story and rectangular in plan, with additions to the rear (southwest) side. The building is topped with a shallow, pitched-side, gabled roof with shallow eaves and exposed, shaped-wood rafter tails and purlins. Many of the building's original features remain, and the building continues to convey its original use as a shop with its, walls sided in board formed concrete, and low, open configuration. Fenestration is aluminum replacement windows and small aluminum sliding sashes. The east door has been replaced with a modern glass door.



Photograph 27: Building 175, January 4, 2013, camera facing south

A large, projecting, two-story addition at the southwestern end of the building is topped with a shed roof, its walls are clad in corrugated metal. Fenestration is both multiple pane fixed windows and vinyl replacement windows. A shed roof covers an open area at the center of the rear elevation adjacent to the corrugated addition. Double paneled wood doors with windows are at the center of the façade. A raised concrete ramp leads to these doors.

Historic maps and documents show that the building that is now Building 175 was constructed in 1910, when the California Cap Company and Pacific Cartridge Company were operating simultaneously. When in use for the Pacific Cartridge Company, Building 175 was numbered both “Building 75” and “Building 76” and was the primary production facility for Pacific Cartridge. The building appears to have been used as a cartridge loading facility during the early years, where powder was loaded into shells.⁴⁹ It also housed a small office, a vault, and cleaning and annealing rooms.⁵⁰ (Metal cartridges were strengthened through heat treating, or annealing.) Both the Pacific Cartridge Company and the California Cap Company were administered from the office in Building 175 (Photograph 28 and 29). By 1916, the company was producing cartridge shells in the building, but no longer loading powder there.⁵¹ Pacific Cartridge Company was absorbed by the California Cap Company circa 1920. The 1949 Sanborn map shows the same uses for the Building 175 but lists only California Cap on the property.⁵²

⁴⁹ Sanborn Map, Stege, 1912.

⁵⁰ Sanborn Map, Stege, 1912.

⁵¹ Sanborn Map, Richmond, 1916.

⁵² Sanborn Map, Richmond, 1949.



Photograph 28: Building 175, circa 1910, from Bancroft Library's Oliver Family Photograph Collection, labeled "Exterior California Cap Company office, California"



Photograph 29: Building 175, circa 1910, from Bancroft Library's Oliver Family Photograph Collection, labeled "Pacific Cartridge Co. Exterior - Stege, Calif."

After UC Berkeley purchased the property in 1950, this building continued to house an office and hazardous chemical storage area.⁵³ Building 175 was the Richmond Field Station's primary facility for maintenance and administration.⁵⁴ During the early 1950s, the Department of Engineering's machine shop was also in Building 175, fabricating experimental equipment for research. By 1952, a new high-speed wind tunnel for research was being assembled in the building.⁵⁵ The University made piecemeal additions to the rear (southwest) of the building beginning in the 1950s. By 1966, Building 175 reached its current footprint and housed machine, carpenter, and welding shops, and an office.⁵⁶ The University removed the original wood frame windows and replaced them with aluminum sashes in 1969.⁵⁷ The building continued to be considered important, as indicated by a 1977 letter arguing for "one of the most important buildings at the Station and if it were lost the program impact could be catastrophic, inasmuch that the Station operations would most likely come to a halt."⁵⁸ It continued to house maintenance operations until approximately 2008, when, in spite of the building's former importance, it was left vacant. It remained vacant until 2012, when the UC Bindery moved into the building.⁵⁹

3.1.20 Building 176

Building 176 is in the southern portion of the Richmond Field Station between Building 175 and Building 150 (Photograph 30). Its primary façade faces northeast, along Lark Drive. The vernacular building does not strongly express any particular architecture style. It is single story and square in plan, 672 square feet, and was constructed prior to 1940.

The building is topped with a front gabled roof, with a large vent on the gable ridge. The building's walls are reinforced concrete covered in stucco. The building lacks fenestration. Its only opening is a flush metal door with a small window on the primary (northeast) elevation, accessed by a sloping concrete walkway that leads from the street.

The California Cap Company constructed Building 176 circa the 1930s. It was originally referred to as "Building 73" and was used by the plant as a warehouse. After UC Berkeley purchased the property in 1950, it continued to use the building for storage. Although the building was retrofitted as an animal lab, it was never used for that purpose. In 1998, it was renovated for the use of a private company named Stratacor that works on topical anti-insect solutions.⁶⁰

⁵³ University of California, Berkeley, 2008, p. 197

⁵⁴ University of California, Berkeley, 2008, p. 20.

⁵⁵ University of California, Berkeley, Department of Engineering, "Richmond Field Station Open House," May 28, 1952, p. 3.

⁵⁶ Sanborn Map, Richmond, 1966.

⁵⁷ University of California, Berkeley, File "Building 175," located in vertical files in Room 148, Richmond Field Station.

⁵⁸ University of California, Berkeley, File "Building 175," located in vertical files in Room 148, Richmond Field Station.

⁵⁹ Shackleton, 2013.

⁶⁰ Shackleton, 2013.



Photograph 30: Building 176, January 4, 2013, camera facing south

3.1.21 Building 178

Building 178 is along the southeastern border of the Richmond Field Station (Photograph 31). It is set back from Egret Way to the east adjacent to building 185. Its primary façade faces northwest. The utilitarian building does not strongly express any particular architecture style. It is single story, rectangular in plan, 3,950 square feet, and was constructed prior to 1940.

The building is topped with a side gabled roof. Its roof and walls are clad in corrugated metal. Fenestration is both aluminum sliding sashes and multiple light wood sashes. There are three entryways on the primary (northwest) elevation. Entrances at the north end and the center of the elevation are metal double doors with windows. The south entrance is a single metal door with a window. At either end of the building the entrances are accessed by sets of wooden stairs. A similar door is at the north end of the rear (southeast) elevation.

Building 178 appears to have been moved to this location circa 1990. Although UC Berkeley property records and building materials suggest a build date prior to 1950, Building 178 does not appear on aerial photographs of this location until the 1990s. Research has not uncovered its original use or location. Building 178 housed the California Conservation Corps until circa 1999, after which it served as an electrical shop and a warehouse. It is currently used for Art Practice Studies.⁶¹

⁶¹ Shackleton, 2013.



Photograph 31: Building 178, January 4, 2013, camera facing northeast

3.1.22 Building 185

Building 185 is along the southeastern border of the Richmond Field Station (Photograph 32). It is set back from Egret Way to the east adjacent to building 178. Its primary façade faces northwest. The utilitarian building does not strongly express any particular architecture style. It is single story, rectangular in plan, 3,165 square feet, and constructed prior to 1940.

The building is topped with a side gabled roof. Its roof and walls are clad in corrugated metal and it lacks fenestration. Entryways, at either end of the primary (northeast) elevation, are flush wood doors. The south door is accessed by a set of wooden stairs. Another entryway is at the north end of the rear (southwest) elevation.

Building 185 appears to have been moved to this location circa 1990. Although UC Berkeley property records and building materials suggest a build date prior to 1950, Building 185 does not appear on aerial photographs of this location until the 1990s. Research has not uncovered its original use or location. The building has been a support facility since the 1990s.



Photograph 32: Building 185, January 4, 2013, camera facing northeast

3.1.23 Building 197

Building 197 is along the southeastern border of the Richmond Field Station (Photograph 33). It is set back from Egret Way to the east adjacent to building 117. Its primary façade faces northeast. The utilitarian building does not strongly express any particular architecture style. It is single story, rectangular in plan, 2,419 square feet, and constructed in 1975.

The building is topped with a very shallow-pitched, side-gabled roof. Its roof and walls are clad in corrugated metal. Fenestration is an aluminum sliding sash. Three large open bays provide access to the northern end of the primary (northeast) elevation. A large metal roll up door is at its southern end. The entrance at the south end of the northwest elevation is a flush metal door.

UC Berkeley constructed Building 197 in 1975. It has been used for support and heavy vehicle storage since its construction. Drums containing waste petroleum products are stored in the building.⁶² The building is not of historic age as it is 38 years old.

⁶² University of California, Berkeley, 2008, p. 28.



Photograph 33: Building 197, January 4, 2013, camera facing southeast

3.1.24 Building 275

Building 275 is in the southern portion of the Richmond Field Station. It is on the south side of Lark Drive between Building 153 and Building 276, with its primary façade facing northeast (Photograph 34). The vernacular building does not strongly express any particular architecture style. It is single story, irregular in plan, 7,914 square feet, and was constructed in 1956.

The front portion of the building, adjacent to Lark Drive, is topped with a flat roof featuring a broad eave overhang with large exposed roof members. The walls are sided in smooth stucco with vertical wood trim. Fenestration is fixed and awning metal sashes. The entrance is a flush door with a window at the east end of the primary (northeast) elevation.

An older, front-gabled building, with its front gable visible behind the flat roof, is joined to the rear of the main section of the building. Its roof and walls are clad in corrugated metal. Fenestration is multiple light fixed metal sashes. This older section of the building has no entryways.

UC Berkeley constructed building 275 in 1956. Originally, it consisted of the long narrow section currently the southwest wing of the building. It was used as a laboratory for hydraulic and coastal engineering and to test ship hull designs.⁶³ The facility included a towing tank for experiments. Historic aerial photographs indicate that the front (northeast) portion of the building along Lark Drive was constructed in 1966. The building currently houses offices.

⁶³ University of California, Berkeley, 2008, p. 14.



Photograph 34: Building 275, January 4, 2013, camera facing west

3.1.25 Building 276

Building 276 is in the southern portion of the Richmond Field Station. It is on the south side of Lark Drive adjacent to Building 276, with its primary façade facing northeast (Photograph 35). UC Berkeley constructed this building in 1956. The utilitarian building does not strongly express any particular architecture style. It is single story and rectangular in plan.

The building is topped with a front-gabled roof. Its walls are corrugated metal. Fenestration is multi-light metal sashes. The main entryway is through a flush metal industrial door. A shed roofed addition projects from the rear elevation of the building.



Photograph 35: Building 276, January 4, 2013, camera facing southwest

3.2 DESCRIPTION OF THE BUILDINGS ADJACENT TO THE PHASE 1 FOOTPRINT (INDIRECT APE)

3.2.1 Building 151

Building 151 is in the southern portion of the Richmond Field Station. It is on the north side of Lark Drive, with its primary façade facing southwest (Photograph 36). This rectangular plan 2,629 square-foot building is a Soule Steel Company prefabricated building, topped with a front gabled roof. Vents are at each gable end. The walls and roof are corrugated metal. Fenestration consists of multi-light, metal sashes. There is also a small aluminum frame window in the center of the primary façade. The main entrance consists of a metal industrial door with a glass insert at the east end. This entrance is sheltered by a metal awning and accessed by a very gradual concrete ramp that runs across the main façade of the building. The rear of the building, at the northeast, contains an overhead mounted sliding door. In 1965, a 1,600 square-foot addition was constructed on the north end of the building.



Photograph 36: Building 155, April 30, 2013, camera facing northeast

3.2.2 Building 154

Building 154 is in the southern portion of the Richmond Field Station. It is on the north side of Lark Drive between Buildings 158 and 151, with its primary façade facing southwest (Photograph 37). The 2,731 square-foot building has a rectangular footprint and is a prefabricated Dudley Steel Building topped with a front gabled roof. The walls and roof are corrugated metal. Primary fenestration consists of multi-light metal sashes. A metal industrial door with a glass insert is centered in its southwest elevation and is the main entrance. This entrance is sheltered by a metal awning and accessed by concrete stairs and a ramp. The rear of the building contains an overhead-mounted sliding door. In 1965, a 1,600 square-foot addition was constructed on the north end of the building. Photograph 38 shows the building in the 1960s.



Photograph 37: Building 154, April 30, 2013, camera facing northeast



Photograph 38, Building 154 at center between Buildings 158 and 151, circa 1965, camera facing northwest

3.2.3 Building 155

Building 155 is in the southern portion of the Richmond Field Station. It is on the north side of Lark Drive between Buildings 151 and 177 (Photograph 39). The vernacular building does not strongly express a particular architecture style. It has 1,896 square feet and one story, with an irregular “U” plan. It was constructed in 1953 by combining three buildings dating from the 1920s.

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The building consists of two side gabled wings joined by a wing that runs perpendicular to the street, forming a “U” shape. The roof is sheathed in replacement composition shingles, its walls clad in horizontal wood siding. Fenestration throughout the building consists of fixed, square, wood frame windows. The windows are not original and were likely replaced during the 1950s. A paneled wood door reached by a set of wooden stairs is centered in the gable end of the southwest wing, which is the closest to Lark Drive. The southwest elevation of the northeast wing features a similar entrance. A third entrance, centered in the connecting wing and faces southeast, is fitted with a modern door and accessed by a concrete ramp.

Construction of Building 155 was pieced together from former California Cap Company Buildings, “Building 64”, “Building 67”, and “Building 92”. The California Cap Company constructed these three buildings circa 1920.⁶⁴ The buildings were originally used for waterproofing and assembling by the California Cap Company.⁶⁵ In 1953, the University appears to have turned “Building 67” perpendicular to its original position to form a connecting wing in a single “U” shaped building. In addition to joining the three buildings, the University replaced original siding and original windows on all three buildings. At first, the southwest wing adjacent to Lark Drive was labeled Building 155, and the northeast (rear) wing was labeled Building 157. At some point, all three wings became known as Building 155.⁶⁶ In 1977, a concrete foundation was installed under the building.⁶⁷



Photograph 39: Building 155, April 30, 2013, camera facing north

⁶⁴ University of California, Berkeley, File “Building 155,” located in vertical files in Room 148, Richmond Field Station.

⁶⁵ University of California, Berkeley, 2008, p. 200 – 204.

⁶⁶ Sanborn Map, 1966.

⁶⁷ Scott Shackleton, University of California, Berkeley, Personal communication with Julia Mates, Tetra Tech 2013.

3.2.4 Building 158

Building 158 is in the southern portion of the Richmond Field Station. It is on the north side of Lark Drive, with its primary façade facing southwest (Photograph 40). The 3,343 square-foot building is a rectangular, prefabricated building topped with a front gabled roof. It features shallow eaves with exposed rafters and exposed steel purlins. The walls and roof are corrugated metal. Fenestration consists of multi-light metal sashes and replacement sliding sashes. An overhead-mounted, sliding, metal door is centered in its southwest elevation. An entrance fitted with a single metal industrial door with a glass insert is adjacent to the large door to the east. This entrance is sheltered by a metal awning and accessed at grade.



Photograph 40: Building 158, April 30, 2013, camera facing northeast

3.2.5 Building 177

Building 177 is in the southern portion of the Richmond Field Station. It is on the north side of Lark Drive, with its primary façade facing southwest (Photograph 41). The vernacular building does not strongly express any particular architectural style. It is a 2,969 square-foot, two-story building with a modified rectangular plan. It is topped by a front gabled roof; its walls are clad in horizontal wood siding. A decorative octagonal vent is centered in the front gable. Fenestration consists of replacement vinyl sashes. The building's main façade is centered in the southwest elevation and features a full width, hipped roof porch.

The two-story main wing of Building 177 is connected to a small, single-story building at the rear, the former Building 179. The single story gable at the rear (northeast) of the building features decorative stickwork at the eaves. An exterior industrial-style staircase leads to the rear portion of the main wing's second floor (Photograph 42).

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Originally constructed circa 1920, Building 177 was known as “Building 72” during the California Cap Company era. “Building 72” consisted of the two-story main wing of what is today Building 177, and is depicted on Sanborn Maps as a “Rest Room.” A separate one story building to the rear, “Building 131,” was also labeled as “Women’s Rest Room” and a “Water Closet” on historic maps.

By the time the University took over the property in 1950, Building 177 had small additions added onto its facade and had become somewhat dilapidated. The University renovated the building in 1953, removing some of the additions and changing the shed roofed entry porch to a small gable roof. By 1966, Building 177 was being used as a maintenance shop. California Cap Company “Building 131” at the rear was renumbered Building 179 and continued to be used as a restroom until it was joined to Building 177. Although Building 179 is still shown on maps of the Richmond Field Station, the rear portion of the building is currently labeled Building 177. Photograph 43 shows the building as it appeared in the 1950s.



Photograph 41: Building 177, April 30, 2013, camera facing north



Photograph 42: rear of two story portion of Building 177 showing exterior stairs, January 4, 2013, camera facing southwest



Photograph 43: Building 177, (background), 1952, camera facing east

3.2.6 Building 180

Building 180 is in the southern portion of the Richmond Field Station. It is on the north side of Lark Drive, and its primary façade faces southwest (Photograph 44). The vernacular building does not strongly express any particular architectural style. It has 11,008 square feet, is single-story, and has an irregular plan. It is topped with a cross gabled roof. The primary fenestration consists of aluminum replacement sliding and awning sashes. The main entrance is centered in the southeast elevation (Photograph 45). Its aluminum framed glass door is sheltered by a flat roofed entry porch and accessed by concrete steps.

Building 180 was constructed piecemeal, combining several buildings, over decades from about the 1920s through the 1930s. As a result, the building has multiple types of wall cladding, including two sizes of brick, horizontal wood siding, and vertical groove plywood. A small two-story wing at the northeast corner of the building contains multi-light wood sash windows that have been painted over.

During the California Cap Company era, the five connected buildings that comprise what is now Building 180 were devoted to manufacturing. “Building 44,” which became the south half of Building 180’s main wing, was devoted to plugging, soldering, and concaving (Photograph 5) when originally used by the California Cap Company. Wire cutting was done in “Building 185,” which became the small two-story wing at the north end of the building (Photograph 4). The north half of the building’s main wing was “Building 170,” where plugging was done for the company. “Building 171,” currently the west wing of Building 180, was a match head manufacturing area. “Building 172” is at the center of Building 180’s main wing and was originally an office. Concrete blast walls on either side of the office protected the space from the explosives handled in Buildings 44 and 170.⁶⁸

After the University took over and renumbered the five buildings, the space Building 180 now stands on was used for photography work and offices. Most of the building’s windows were replaced with aluminum sashes sometime during the 1980s. In 1982, restrooms and a conference room were installed in Building 180. The new restroom facility served the Sea Water Conversion complex which, prior to 1982, did not have plumbed indoor toilets.⁶⁹ It is currently used as offices.

⁶⁸ Sanborn Maps, 1949.

⁶⁹ University of California, Berkeley, File “Building 180,” located in vertical files in Room 148, Richmond Field Station.



Photograph 44: Building 180, April 30, 2013, camera facing northeast



Photograph 45: Building 180, April 30, 2013, camera facing west

3.2.7 Building 198

Building 198 is in the southern portion of the Richmond Field Station across Lark Drive from Building 197 (Photograph 46). It is an 1,800 square-foot, rectangular plan, prefabricated building, topped with a very shallow pitched, gable roof with vents in the gables. Its walls and roof are corrugated steel and the building lacks fenestration. A

large metal roll-up door is centered in its northwest elevation, while its southwest elevation features a metal industrial entrance door at grade.



Photograph 46: Building 198, April 30, 2013, camera facing northeast

3.2.8 Building 201

Building 201 is in the southwestern portion of the Richmond Field Station, along Avocet Way, on a 3.5-acre parcel. It is a single-story building and houses the U.S. Environmental Protection Agency's Region IX laboratory and office building. The building has 46,000 square feet and is a tilt-up building that is ornamented through with reveals and indentations in the tilt-up panels, with sculpting. Covered trellises surround the building's walkways, and the main entrance features a modern glass enclosure. It was constructed in 1992.

3.2.9 Building 277

Building 277 is in the southern portion of the Richmond Field Station. It is on the north side of Lark Drive, with its primary façade facing northwest (Photograph 47). It is 21,426 square feet and was constructed circa 1966. The single-story building is a rectangular plan, prefabricated building topped with a front gabled roof. The walls and roof are corrugated metal. Fenestration consists of metal sash windows that appear to have been repurposed from a vehicle. Its primary entrance is in the northwest elevation, which faces Avocet Way. A metal industrial entry door is set inside a large sliding door. Building 277 was constructed as a model basin building for salinity intrusion study. It has been used throughout its life for storage.



Photograph 47: Building 277, April 30, 2013, camera facing east

3.3 HISTORIC BACKGROUND OF RICHMOND FIELD STATION

Europeans arrived in what would become Contra Costa County in 1772, when a Spanish expedition led by Pedro Fages discovered the San Pablo Bay at the confluence of the Sacramento and San Joaquin rivers.⁷⁰ Though subsequent Spanish expeditions passed through the region, the Spanish do not appear to have settled in the present-day City of Richmond area during the Mission Period of 1769 through 1833.

In the 1820s and 1830s, the Mexican government began granting large tracts of land in the area to its citizens, including Ranchos San Pablo, San Ramon, and Pinole. The first permanent non-native settlers were Francisco Castro and his wife Maria Gabriela Berryessa. The Mexican government granted the 18,000 acre Rancho San Pablo to the Castros in 1823.⁷¹ Americans began farming in Contra Costa County in the late 1830s, and by 1882, two-thirds of the cultivated land in the county was devoted to wheat production.⁷²

Minna C. C. Quilfelt (or Quilfeldt) purchased 600 acres of Rancho San Pablo in 1852 and 1853.⁷³ Adjacent to San Francisco Bay in what would eventually become the southern portion of the City of Richmond, a wharf and produce warehouse were constructed on the ranch in the 1860s to ship agricultural produce to the San Francisco markets from Rancho

⁷⁰ Mildred B. Hoover,, Hero E. Rensch, Ethel G. Rensch, Douglas E. Kyle, *Historic Spots in California, Fourth Edition*, Stanford University Press, Stanford, California: 1958, p. 129.

⁷¹ Donald Bastin, *Images of America: Richmond*, Arcadia Publishing, Charleston SC: 2003, p. 9.

⁷² J.P. Munro-Fraser, *History of Contra Costa County, California*, W.A. Slocum & Co., San Francisco: 1882, p. 55 – 57.

⁷³ Evan Griffins, "Early History of Richmond," December 1938, El Cerrito Historical Society, website: <http://www.elcerritowire.com/history/pages/EarlyRichmond.htm>, accessed January 2013.

San Pablo and the Quilfelt ranch. The warehouse and wharf were used to transport cattle, grain, fruit, and in later years, the frogs' legs raised by Richard Stege for the San Francisco restaurant market.⁷⁴ German native Richard Stege settled on Rancho San Pablo in the late 1860s after stints in the gold fields and the Siberian fur trade. He married Minna Quilfelt, a widow, in 1870.⁷⁵ Minna Quilfelt Stege died in 1879, leaving the ranch to Stege and her daughter Edith. Stege began selling off portions of his ranch to raise money while continuing his frog-raising and other ventures. A town named Stege formed on Richard Stege's holdings, and by the late nineteenth century, several industries, including the California Cap Works, the United States Briquette Company, the Stauffer Chemical Works and the Stege Lumber Manufacturing Company, were operating from portions of the Stege Ranch.⁷⁶ The City of Richmond incorporated in 1905, and by 1917, it was already the largest city in Contra Costa County.⁷⁷ The town of Stege was eventually absorbed into Richmond as the latter grew.

3.4 HISTORIC CONTEXTS

3.4.1 The Explosives Industry in Contra Costa County

Swedish chemist Alfred Nobel laid the foundation for the high-explosives industry with his innovations beginning in the 1860s, inventing first a detonator and then a blasting cap. In 1867, he invented dynamite, safer, cheaper, and more powerful than nitroglycerine that had been the most commonly used explosive. Nobel licensed the Giant Powder Company to produce dynamite in California later that year. Giant was the first American company to produce dynamite, and its plant was initially in Rock House Canyon, in what is today the City of San Francisco. The California Powder Works began manufacturing dynamite in the same area in 1869.⁷⁸

The nineteenth century explosives industry was extremely dangerous, and as San Francisco's population grew, explosives manufacturers needed to relocate. Contra Costa County across the bay was attractive since it was accessible due to its close proximity to the harbor, yet remote enough from population centers. The narrow canyons of Contra Costa County, which terminate in small bays, provided a natural geographical defense against explosions by allowing factory design that placed water between different facets of explosives manufacturing.⁷⁹

During the 1870s, chemical and explosives manufacturers began opening near what would eventually become the City of Richmond. The Tonite Powder Company, Western Mineral Company, and California Cap Company were established at 1877, on the Stege ranch. Soon, San Francisco explosives companies followed those explosive companies across the bay to Contra Costa County. In 1880, Giant relocated to Point Pinole, changing its name to the Atlas Powder Company. The California

⁷⁴ Roland Oliver, "Recollections of Early Industries in Stege," August 7, 1959, p. 1.

⁷⁵ Munro-Fraser, p. 675.

⁷⁶ Frederick J. Hulaniski, *The History of Contra Costa County, California*. Elms Publishing Company, Berkeley, California: 1917, p. 354.

⁷⁷ Hulaniski p. 288.

⁷⁸ Ida Mae Purcell, *History of Contra Costa County*, The Gillick Press, Berkeley, California" 1940, p. 645 – 646.

⁷⁹ James E. Vance, *Geography and Urban Evolution in the San Francisco Bay Area*, University of California, Berkeley: 1964, p. 27.

Powder Works soon followed, building a new factory in Hercules, named for the brand under which the company sold its powder.⁸⁰ The Vulcan Powder Works and Judson Powder works also opened in the Stege Ranch area during this era, consolidating Contra Costa County's position as the cradle of the California explosives industry. The East Bay dominated California explosives manufacturing into the twentieth century. In 1902, California had only one powder factory outside Contra Costa and Alameda counties.⁸¹

3.4.2 The California Cap Company

William Letts Oliver

William Letts Oliver was born in Chile to English parents in 1844. He attended the University of Edinburgh and became a mining engineer. After returning to Chile, Oliver ran an explosives factory that was nationalized by the Chilean government in 1864. After the loss of his factory, Oliver left Chile for San Francisco.⁸² William Letts Oliver and his wife Carrie lived in Oakland, from about 1880, until Oliver's death in 1918.⁸³ The couple eventually had six children together: Roland, Edwin, Caroline, Anita, William Harold, and Albert.⁸⁴ In addition to his various professional activities, William Letts Oliver was a yachtsman and an officer of the Bohemian Grove club in the early twentieth century. He was an avid amateur photographer throughout his lifetime; UC Berkeley's Bancroft Library has a collection of 2700 negatives and prints taken by Oliver and his son.⁸⁵

William Letts Oliver initially gained familiarity with an explosive called guncotton while manufacturing collodion for his photography hobby.⁸⁶ As early as 1870, European explosive companies were experimenting with nitrated guncotton, and, by 1875, it was manufactured in England under the name "tonite."⁸⁷ By 1877, Oliver had left Chile and was mining in the western United States. Engineers working on the Sutro Tunnel in the Comstock needed an explosive to complete the tunnel that would remain stable at the high temperatures underground, and Oliver was able to solve the problem by substituting tonite for more volatile compounds.⁸⁸

⁸⁰ Purcell, p. 646.

⁸¹ Richmond Record, "Contra Costa County: Under the Vitascope," Richmond:1902.

⁸² Pacific Mining News, Supplement to Engineering & Mining Journal-Press, "Industrial Notes: Developing of the Blasting Cap Industry," Vol. 1, No. 7, November 1922, p. 222.

⁸³ United States Census Bureau, Tenth Census of the United States, 1880, National Archives and Records Administration, Washington, D.C., San Francisco, California, Roll: 79, Film: 1254079, Page: 170B.

⁸⁴ United States Census Bureau, Twelfth Census of the United States, 1900, National Archives and Records Administration, Washington, D.C., Oakland Ward 3, Alameda, California, Roll: 82, Page: 13A.

⁸⁵ Online Archive of California, "Guide to the Oliver Family Photograph Collection," UC Berkeley:2009, website: <http://www.oac.cdlib.org/findaid/ark:/13030/ft0q2n99r1/> accessed February, 2013.

⁸⁶ Blasting Cap Industry," Vol. 1, No. 7, November 1922, p. 222.

⁸⁷ G.A. Price Cuxson, ed., "Society of Engineers: Transactions for 1889," E. & F. N. Spon, London: 1890, p. 95.

⁸⁸ Pacific Mining News, Supplement to Engineering & Mining Journal-Press, "Industrial Notes: Developing of the Blasting Cap Industry," Vol. 1, No. 7, November 1922, p. 222.

The California Cap Company

In 1877, William Letts Oliver was inspired by his success with tonite to leave mining and establish the Tonite Powder Company, on a portion of the former Stege Ranch.⁸⁹ In the 1870s, all blasting caps in the United States had to be imported from Europe. Not only were they expensive, but the timing of deliveries was uncertain, creating business difficulties for the powder plant. Oliver was determined to create his own caps to protect the tonite factory business. He experimented until he came up with a blasting cap that was safer to use and had better detonating qualities than imported detonators. Oliver and his partner Freeborn Fletter founded the California Cap Company. It was adjacent to the Tonite Powder Company, and was a parcel carved out of the southern portion of Stege Ranch.⁹⁰ California Cap Company, which went on to operate on the site for nearly seven decades, was the first manufacturer of blasting caps in the United States. Richard Stege, meanwhile, continued to reside on the ranch, and contracted with Tonite Powder and California Cap to transport their products to the railroad.⁹¹ The California Cap Company was on the parcel that is currently the Richmond Field Station. The Tonite Powder Company appears to have been to the east on the parcel that became the Stauffer Chemical Company and later the Zeneca site, although its exact location is unclear.

The Tonite and California Cap factories, the first of several gunpowder and chemical companies in the region, were separated by the Stege agricultural warehouse for safety.⁹² The explosives industry during this era was an extremely dangerous one. A horrific explosion in 1882, at the nearby Vulcan Powder Company caused 11 deaths and destroyed the plant.⁹³ Between 1882 and 1918, the Hercules and Atlas plants suffered numerous explosions that destroyed plant buildings and killed 64 workers.⁹⁴ Despite its focus on safety, the California Cap Company also had accidents. Two of its Chinese workers were killed in 1917, when one of them dropped a tray of caps. In 1941, an explosion caused a fire and critically injured a worker.⁹⁵

William Letts Oliver continued to innovate throughout his long career in the chemical and explosives industries. In 1888, he formed the American Lucol Company adjacent to the California Cap Company property.⁹⁶ The Lucol plant was at what is currently the southeastern corner of the Richmond Field Station, at the approximate location of Building 163. Lucol manufactured a linseed oil substitute.⁹⁷ The factory was dismantled and relocated to New Jersey circa 1900.⁹⁸ In 1903, the Hotaling Briquette Works opened on Lucol's site at the southeast corner of the current Richmond Field

⁸⁹ Oliver, p. 1.

⁹⁰ Pacific Mining News, Supplement to Engineering & Mining Journal-Press, "Industrial Notes: Developing of the Blasting Cap Industry," Vol. 1, No. 7, November 1922, p. 222.

⁹¹ Nilda Rego, "Enterprising Stege lost all and died without a penny," Time Out, March 27, 1994, p. 2, column 4.

⁹² Oliver, p. 1.

⁹³ Munro-Fraser, p. 424.

⁹⁴ Purcell, p. 648.

⁹⁵ Contra Costa County Standard, "Stege Powder Plant Blast; One Near Death," June 6, 1941, p. 1A.

⁹⁶ Oliver, p. 1.

⁹⁷ Max Wilhelm Von Bernewitz, *Cyanide Practice, 1910 – 1913*, Dewey Publishing Company: 1913, p. 327.

⁹⁸ Oliver, p. 1.

station property.⁹⁹ Later known as the U.S. Briquette Company, the plant appears to have operated at this location until at least 1917.¹⁰⁰ The U.S. Briquette Company operated an explosive manufacturing plant at what is now the Richmond Field Station, but its buildings were demolished sometime in the 1960s.¹⁰¹

The Oliver family aggressively promoted their products through advertising and publishing. The California Cap Company sponsored or published articles and book-length treatises on the use of explosives. Safety was a key element of the company image, a topic of company-sponsored technical writing and a selling point in advertisements.¹⁰² The Tonite Powder Company's product was known even outside the United States, and by the end of the nineteenth century, the powder's explosive properties were considered comparable to the finest English products.¹⁰³ Oliver's sons Roland and Edwin Letts Oliver both graduated from UC Berkeley's College of Mining in 1900. Roland Oliver seems to have spent his entire career working in the family enterprises, while Edwin worked at California Cap between mining and other ventures. The Oliver family became benefactors of the university, and in 1917, the California Cap Company donated substantial amounts of their products to the College of Mining, including 500 electric detonators, 500 delayed action exploders, and 500 blasting caps.¹⁰⁴

Eventually, the Tonite factory appears to have been incorporated into the California Cap Company. The Olivers also formed an entity named Pacific Cartridge Company circa 1910. The Pacific Cartridge Company operated from the California Cap plant during World War I.¹⁰⁵ By 1916, there were at least a dozen buildings on the site. When Oliver died in 1918, his son Roland Oliver took over as president of California Cap Company. By 1922, Roland's brother Leslie Oliver was assistant manager of the plant and Edwin Letts Oliver was a director.¹⁰⁶ Roland Oliver substantially expanded the California Cap Company after he took over as president. During this era the plant grew to include 150 buildings and a horse-drawn tram line.¹⁰⁷

During the 1920s, the California Cap Company was granted patents on some of its inventions, including Albert Leslie Oliver's invention of an improved electric blasting cap. One of the improvements with Oliver's blasting cap is that the flame or sparks emitted by the fuse portion of the igniter would not come in contact with the explosive charge.¹⁰⁸ In 1925, Edward Barnes of the California Cap Company patented a new method of manufacturing fulminate of mercury. Traditional mercury fulminating,

⁹⁹ Oliver, p. 2.

¹⁰⁰ Hulanski, p. 354.

¹⁰¹ University of California, Berkeley (UC Berkeley), 1973. *Sanitary Engineering Research Laboratory News Quarterly*, Volume XXIII, No. 2. Richmond, California. April

¹⁰² Halbert Powers Gillette, *Rock Excavation: Methods and Cost*, M.C. Clark, New York: 1904, x.

¹⁰³ Manual Eissler, *A Handbook on Modern Explosives*, Crosby, Lockwood & son, London: 1897, p. 117.

¹⁰⁴ University of California, *The University of California Chronicle*, University of California Press, January, 1917, p. 92.

¹⁰⁵ R.L. Polk & Company, *Richmond and Contra Costa County Directory, 1914 – 1915*, Oakland, California: 1915.

¹⁰⁶ Pacific Mining News, p.222.

¹⁰⁷ University of California, Berkeley, *Current Conditions Report*, Prepared by Tetra Tech EM Inc., November 21, 2008, p. 11; for photographs of the California Cap Company's cap test, cap containers, fuses, and tools please see the Tulane University's Digital Media website: [http://lunaweb.giza.tulane.edu/luna/servlet/view/search/?&q=california cap company](http://lunaweb.giza.tulane.edu/luna/servlet/view/search/?&q=california%20cap%20company).

¹⁰⁸ United States Patent Office, Albert Leslie Oliver, of Oakland, California, Assignor to California Cap Company of Oakland, California, a Corporation, Electric Blasting Cap, Application Filed January 27, 1920, Patented May 17, 1921, 1,878,269.

which had remained virtually unchanged since 1800, was limited to small quantities due to the volatility of gasses released by the reactions. Barnes's new process removed and condensed the volatile gasses, which allowed for the safe manufacture of much larger quantities of fulminate of mercury.¹⁰⁹

During the late nineteenth and early twentieth century, the California Cap Company was one of the most important local employers.¹¹⁰ As the twentieth century progressed, more heavy industry came to Contra Costa County, and by 1940, the county was second only to Los Angeles in overall industrial production.¹¹¹ The nineteenth-century California Cap Company was dwarfed by the scale of some of the newer enterprises, and its physical plant and technology were aging. During World War II, California Cap was able to stay open by producing delayed action incendiary bombs that were used against Japan.¹¹² The California Cap Company could not survive the transition to a peacetime economy, and by 1949, the plant was closed and the Oliver family was looking for a buyer.

3.4.3 University Research/Richmond Field Station

After World War II, UC Berkeley's Engineering Department needed an off-campus location to do experiments that required more space than a laboratory. Department Chair Morrrough P. O' Brien and others in the department were doing experiments with sewage, sea water, and other materials unsuited to use on a crowded campus. They wanted a location that was not too remote, and The University purchased the California Cap Company from the Oliver family, for the use of the Engineering Department, in 1950.¹¹³

The Richmond Field Station has been the location of research overseen by numerous UC Berkeley departments over the years. The SERL was one of the first departments to undertake research at the site. SERL focused primarily on sewage treatment technology, and researched pollution control and disposal of solid and liquid waste.¹¹⁴ Other early projects at the field station included sea water distillation, heat transfer, and cyclic stress research.¹¹⁵

At first the Department of Engineering used the buildings left behind by the California Cap Company. The Department established a machine shop, computer shop, receiving facility, mail service, and other facilities in addition to laboratories in the old detonator company buildings.¹¹⁶ The current Buildings 102, 110, 118, 128, 150, 152 175, and 176 all date to the Cap Company era and have been repurposed for the University's use. The university constructed new buildings as funds became available, and by the mid-

¹⁰⁹ United States Patent Office, Edward A. Barnes of Oakland, California, Assignor to California Cap Company, of Oakland, California, A Corporation of California, Method of Manufacturing Fulminate of Mercury, Application Filed on April 13, 1922, Serial no. 548, 921, Patented January 13, 1925, 1,523,339.

¹¹⁰ Marguerite Clausen, "On the Waterfront: An Oral History of Richmond, California," Regional Oral History Office, University of California, Berkeley, 1990, p. 21.

¹¹¹ Purcell, p. 649.

¹¹² Oliver, p. 1.

¹¹³ P.H. McGahey, "The Sanitary Engineering Research Laboratory: Administration, Research and Consultation, 1950-1975 – An Interview Conducted by Malca Call," Regional Oral History Office, University of California, Berkeley, 1974, p. 70.

¹¹⁴ University of California, Berkeley, 2008, p. 13.

¹¹⁵ University of California, Berkeley, Department of Engineering, "Richmond Field Station Open House," May 28, 1952, p. 3 – 4.

¹¹⁶ McGahey, p. 71.

1950s, five new buildings had been completed at the Richmond Field Station.¹¹⁷ By the 1970s, the department had done many experiments at the Richmond Field Station that could not have been performed on the main campus.

The Richmond Field Station has been the location of research overseen by numerous UC Berkeley departments over the years. The Sanitary Engineering Research Laboratory (SERL) was one of the first departments to do research at the site. SERL focused primarily on sewage treatment technology and researched pollution control and disposal of solid and liquid waste.¹¹⁸ Other early projects at the field station included heat transfer and cyclic stress research.¹¹⁹

Another laboratory that used the Richmond Field Station was the Sea Water Conversion Laboratory (SWCL). In 1952, Congress created and funded the Office of Saline Water in order to encourage desalination studies as a solution to water shortages.¹²⁰ In response, UC Berkeley Mechanical Engineering professor Everett D. Howe formed the SWCL at the Richmond Field Station in 1958.¹²¹

Building 154 was constructed circa 1957 for SWCL research, and the program continued to expand under Howe's direction for the next decade. SWCL eventually encompassed most of the buildings on the north side of Lark Drive, including Buildings 151, 155, 158, 177, and 180.¹²²

In 2013, the Richmond Field Station continues to accommodate UC Berkeley's engineering research projects that cannot be done on the main campus and other space-intensive adjuncts to the University. SERL was eventually renamed, and is currently known as the Environmental Engineering and Health Sciences Laboratory (EEHSL). EEHSL has continued its presence at the Richmond Field Station into the twenty-first century, operating indoor and outdoor laboratories throughout the site.¹²³ The Northern Research Library Facility, the Asbestos Information Center, and the Earthquake Resource Center are among the University facilities at the site.¹²⁴ The Richmond Field Station also has non-UC tenants that include the EPA Region 9 Laboratory in Building 201.¹²⁵

¹¹⁷ University of California, Berkeley, Department of Engineering, "Guide for Engineering Field Station Inspection," undated, p. 3.

¹¹⁸ University of California, Berkeley, 2008, p. 13.

¹¹⁹ University of California, Berkeley, Department of Engineering, "Richmond Field Station Open House", May 28, 1952, p. 3–4.

¹²⁰ Heather Cooley, Peter H. Gleick, and Gary Wolff, "Desalination, With a Grain of Salt: A California Perspective," Pacific Institute, Oakland, California: 2006, p.11.

¹²¹ University of California (System) Academic Senate, "1991, University of California: In Memoriam," 1991, Internet website: <http://texts.cdlib.org/view?docId=hb4t1nb2bd&doc.view=frames&chunk.id=div00031&toc.depth=1&toc.id=>

¹²² University of California, Berkeley, Files "Building 151", "Building 154", "Building 158", "Building 177", and "Building 180," located in vertical files in Room 148, Richmond Field Station.

¹²³ University of California, Berkeley, 2008, p. 13.

¹²⁴ University of California, Berkeley, 2008, p. 16 – 17.

¹²⁵ University of California, Berkeley, 2008, p. 21.

4. EVALUATION OF SIGNIFICANCE

The criteria for identifying historical resources under CEQA are in Section 15064.5(a)(2)-(3) of the CEQA Guidelines, according to the criteria outlined in Section 5024.1 of the California Public Resources Code. According to this code, properties listed in or formally determined eligible for listing in the NRHP are automatically eligible for listing in the CRHR. The CRHR criteria are largely based on the NRHP criteria, which are codified in 36 CFR Part 60 and explained in guidelines published by the Keeper of the National Register.¹²⁶

Eligibility for listing on either the NRHP or the CRHR rests on both significance and integrity. A property must have both factors to be considered eligible. Loss of integrity, if sufficiently great, would overwhelm the historical significance of a resource and render it ineligible. Likewise, a resource can have complete integrity, but if it lacks significance, it must also be considered ineligible. The application of the four criteria and the definition of integrity are discussed below.

4.1 CRITERIA OF SIGNIFICANCE

Properties may be significant at the local, state, or national level.

4.1.1 National Register of Historic Places

National historical significance is judged in part by applying NRHP Criteria A through D:

- Criterion A: Association with events or trends significant to the broad patterns of our history;
- Criterion B: Association with the lives of significant individuals;
- Criterion C: A property that embodies the distinctive characteristics of a type, period, or method of construction that represents the work of a master or that possesses high artistic values;
- Criterion D: Has yielded or is likely to yield information important to history or prehistory.¹²⁷

Properties that are less than 50 years old may also be evaluated under Criteria Consideration G:

- Criterion G: Properties that have achieved significance within the past 50 years. The National Register Criteria for Evaluation exclude properties that achieved significance within the past 50 years unless they are of exceptional importance.

¹²⁶ The most widely accepted guidelines are contained in the U.S. Department of Interior, National Park Service, "How to Apply the National Register Criteria for Evaluation," *National Register Bulletin 15* (Washington D.C.: US Government Printing, 1991, revised 1995 through 2002).

¹²⁷ Criterion D is largely applied to archaeological sites, so is not used in evaluating most historic architectural resources.

Fifty years is a general estimate of the time needed to develop historical perspective and to evaluate significance. This consideration guards against the listing of properties of passing contemporary interest and ensures that the NRHP is a list of truly historic places.¹²⁸

The NRHP definition of integrity is determined through applying seven factors to the historical resource: location, design, setting, workmanship, materials, feeling, and association. These criteria can be roughly grouped into the following types of integrity considerations:

- Location and setting relate to the relationship between the property and its environment;
- Design, materials, and workmanship, as they apply to historic buildings, relate to construction methods and architectural details; and
- Feeling and association, the least objective of the seven criteria, pertain to the overall ability of the property to convey a sense of the historical tie and place where it was constructed.

4.1.2 California Register of Historical Resources

The criteria for assessing a property for listing in the CRHR closely parallel those of the NRHP. CEQA requires consideration of the possible impacts on and the evaluation of historic resources using the criteria in the CRHR. Each resource must be assessed to determine whether it meets any of the criteria below, paraphrased as:

- Criterion 1: Resources associated with important events that made a significant contribution to broad patterns of our history;
- Criterion 2: Resources associated with the lives of persons important to our past;
- Criterion 3: Resources that embody the distinctive characteristics of a type, period, or method of construction, or represents the work of a master;
- Criterion 4: Resources that yielded, or may be likely to yield, information important in prehistory or history.¹²⁹

The CRHR definition of integrity, and its special considerations for certain properties, is slightly different than that for the NRHP. Integrity is defined as “the authenticity of an historical resource’s physical identity evidenced by the survival of characteristics that existed during the resource’s period of significance.” The CRHR further states that

¹²⁸ The most widely accepted guidelines are in the US Department of the Interior, National Park Service, “Guidelines for Applying the National Register Criteria for Evaluation,” *National Register Bulletin 15* (Washington DC: US Government Printing, 1991, revised 1995 through 2002).

¹²⁹ California Code of Regulations, Sections 4850 through 4858; Office of Historic Preservation, Instructions for Nominating Historical Resources to the California Register of Historical Resources, August, 1997; as was the case with NRHP Criterion D, Criterion 4 is largely applied to archaeological sites, so is not used in evaluating most historic architectural resources.

eligible resources must “retain enough of their historic character or appearance to be recognizable as historical resources and to convey the reasons for their significance,” and the CRHR lists the same seven aspects of integrity used for evaluating properties under the NRHP criteria. The CRHR’s special considerations for certain property types are limited to: 1) moved buildings, structures, or objects; 2) historical resources achieving significance within the past 50 years; and 3) reconstructed buildings.

4.2 HISTORIC EVALUATION OF BUILDINGS IN THE DIRECT APE

The California Cap Company in its heyday comprised 150 buildings on its expansive site. The University took possession of the property in 1950, initially using the existing buildings for engineering laboratories. As time passed, UC Berkeley began altering the property to suit its changing needs. Over its seven decades of ownership, the University repurposed, remodeled, moved, or demolished almost all of the buildings left behind by the California Cap Company. The University altered the property by constructing a number of new buildings. The Richmond Field Station as a whole, therefore, does not retain sufficient integrity to be listed in the NRHP or the CRHR or as a historic district.

Despite the scope of the alterations to the property, a handful of buildings have been retained from the California Cap Company period. Three of these, Buildings 102, 150, and 175, were determined, through this report, to be historically significant. Despite meeting eligibility under Criterion A/1, Building 102 has been repeatedly altered over the decades and no longer retains sufficient integrity to be eligible for listing in the NRHP or the CRHR. Only Buildings 150 and 175 have retained sufficient integrity to be individually eligible for listing.

4.2.1 Building 102

Criterion A/1: Building 102 meets Criterion A/1 for its association with events significant to national, state, and local history. It is the oldest building on the Richmond Field Station, dating to the property’s ranching era. The manufacturing activities that took place in Building 102 were central to the production processes of the California Cap Company, the first blasting cap company in the United States. The company also manufactured bombs in the building that were used against the Japanese during World War II.

Criterion B/2: Because this building is associated with important individuals significant to our past, it meets this criterion. Building 102 is the oldest of the extant buildings at the Richmond Field Station, and, therefore, it is the most notably associated with California Cap Company founder William Letts Oliver. Oliver was a significant figure in the history of explosives manufacture, responsible for the invention of a high-heat explosive named “Tonite”, and the first manufacturer of blasting caps in the United States. Building 102 is

the only California Cap Company building specifically discussed in a document created in 1959 by William Letts Oliver's son Roland Oliver.¹³⁰

Criterion C/3: The building does not embody the distinctive characteristics of a type, period, region, or method of construction, or represent the work of an important creative individual or possess high artistic values. Building 102 is a utilitarian building constructed piecemeal over many decades, so the building is not eligible to the NRHP for its architecture and does not meet this criterion.

Criterion D/4: In rare instances, buildings themselves can serve as sources of important information, but this building is not a principal source of important information in this regard. As a result, it does not meet this criterion.

Despite meeting Criteria A/1 and B/2 due to Building 102's association with the California Cap Company and William Letts Oliver, the building's integrity has suffered due to repeated alterations. Only its location has remained unchanged, and its historic integrity of setting, design, materials, workmanship, feeling, and association has all been compromised. As demonstrated by a comparison of historic and contemporary photographs (Photograph 1, Photograph 2, and Photograph 3) of the building, extensive alterations to the primary façade of Building 102 have rendered it virtually indistinguishable from buildings constructed in the late twentieth century. These alterations, which include replacement of exterior siding, replacement of windows, alterations to the size of window openings, a modification of the roof from gabled to flat, and other changes, have drastically impaired the building's ability to convey historic significance. Therefore, the building is not eligible for the NRHP or the CRHR.

4.2.2 Building 110

Criterion A/1: No particular association was found between Building 110 and events significant to national, state, or local history. Although the California Cap Company was the first blasting cap manufacturer in the United States there is no indication that the research that took place in Building 110 was central to the development of the plant or its technical processes, so the building does not meet this criterion and is not eligible for inclusion in the NRHP or CRHR for historical significance.

Criterion B/2: Building 110 dates from the period when William Letts Oliver and his son Roland Oliver were making important breakthroughs in the explosives industry. However, no particular association has been found between the building and members of the Oliver family, or with other important individuals significant to our past, so the building does not meet this criterion and is not eligible for the NRHP or CRHR for association with important individuals.

Criterion C/3: The building does not embody the distinctive characteristics of a type, period, region, or method of construction, or represent the work of an important

¹³⁰ Oliver, p.1.

creative individual or possess high artistic values. Building 102 is a vernacular building of a type commonly constructed from the late nineteenth to the early twentieth century, so the building is not eligible under this criterion.

Criterion D/4: In rare instances, buildings themselves can serve as sources of important information, but this building is not a principal source of important information in this regard and does not meet this criterion.

Building 110 does not meet the significance criteria for listing in the NRHP or CRHR.

4.2.3 Building 111

Criteria A/1 and B/2: Building 111 does not meet these criteria for listing in NRHP or CRHR because it lacks historical significance. The structure has been a storage facility throughout its lifetime and lacks the strength of association necessary to be considered historically significant in relation to any particular events or persons.

Criterion C/3: The utilitarian building lacks any identifiable architectural stylistic design and does not embody distinctive architectural or engineering qualities of type, period, or method of construction. As a result, it does not meet this criterion.

Criterion D/4: In rare instances, buildings themselves can serve as sources of important information, but this building is not a principal source of important information in this regard. As a result, this building does not meet this criterion.

Criterion G: As a storage facility, Building 111 does not meet the standard of exceptional importance required for properties under 50 years old to be eligible to the NRHP.

Building 111 does not meet the significance criteria for listing in the NRHP or CRHR.

4.2.4 Building 112

Criteria A/1 and B/2: Building 112 does not meet the criteria for listing in NRHP or CRHR because it lacks historical significance. The structure has served various functions throughout its lifetime and lacks the strength of association necessary to be considered historically significant in relation to any particular events or persons.

Criterion C/3: The simple building lacks any identifiable architectural stylistic design and does not embody distinctive architectural or engineering qualities of type, period, or method of construction.

Criterion D/4: In rare instances, buildings themselves can serve as sources of important information, but this building is not a principal source of important information in this regard.

Building 112 does not meet the significance criteria for listing in the NRHP or CRHR.

4.2.5 Building 113

Criteria A/1 and B/2: Building 113 does not meet the criteria for listing in NRHP or CRHR because it lacks historical significance. The structure has been a storage facility throughout its lifetime and lacks the strength of association necessary to be considered historically significant in relation to any particular events or persons.

Criterion C/3: The utilitarian building lacks any identifiable architectural stylistic design and does not embody distinctive architectural or engineering qualities of type, period, or method of construction.

Criterion D/4: In rare instances, buildings themselves can serve as sources of important information, but this building is not a principal source of important information in this regard.

Criterion G: As a storage facility, Building 113 does not meet the standard of exceptional importance required for properties less than 50 years old to be eligible to the NRHP.

Building 113 does not meet the significance criteria for listing in the NRHP or CRHR.

4.2.6 Building 114

Criteria A/1 and B/2: Building 114 does not meet the criteria for listing in NRHP or CRHR because it lacks historical significance. The structure has primarily been used for storage throughout its lifetime and lacks the strength of association necessary to be considered historically significant in relation to any particular events or persons.

Criterion C/3: The simple building lacks any identifiable architectural stylistic design and does not embody distinctive architectural or engineering qualities of type, period, or method of construction.

Criterion D/4: In rare instances, buildings themselves can serve as sources of important information, but this building is not a principal source of important information in this regard.

Building 114 does not meet the significance criteria for listing in the NRHP or CRHR.

4.2.7 Building 116

Criteria A/1 and B/2: Building 116 does not meet the criteria for listing in NRHP or CRHR because it lacks historical significance. The structure has primarily been used for storage throughout its lifetime and lacks the strength of association necessary to be considered historically significant in relation to any particular events or persons.

Criterion C/3: The utilitarian prefabricated building lacks any identifiable architectural stylistic design and does not embody distinctive architectural or engineering qualities of type, period, or method of construction.

Criterion D/4: In rare instances, buildings themselves can serve as sources of important information, but this building is not a principal source of important information in this regard.

Building 116 does not meet the significance criteria for listing in the NRHP or CRHR.

4.2.8 Building 117

Criteria A/1 and B/2: Building 117 does not meet the criteria for listing in NRHP or CRHR because it lacks historical significance. The structure has had various functions throughout its lifetime and lacks the strength of association necessary to be considered historically significant in relation to any particular events or persons.

Criterion C/3: The utilitarian building lacks any identifiable architectural stylistic design and does not embody distinctive architectural or engineering qualities of type, period, or method of construction.

Criterion D/4: In rare instances, buildings themselves can serve as sources of important information, but this building is not a principal source of important information in this regard.

Building 117 does not meet the significance criteria for listing in the NRHP or CRHR.

4.2.9 Building 118

Criteria A/1 and B/2: Building 118 does not meet the criteria for listing in NRHP or CRHR because it lacks historical significance. The structure has had various functions throughout its lifetime and lacks the strength of association necessary to be considered historically significant in relation to any particular events or persons.

Criterion C/3: The utilitarian building lacks any identifiable architectural stylistic design and does not embody distinctive architectural or engineering qualities of type, period, or method of construction.

Criterion D/4: In rare instances, buildings themselves can serve as sources of important information, but this building is not a principal source of important information in this regard.

Building 118 does not meet the significance criteria for listing in the NRHP or CRHR.

4.2.10 Building 120

Criteria A/1 and B/2: Building 120 does not meet the criteria for listing in NRHP or CRHR because it lacks historical significance. The structure has been used for storage throughout its lifetime and lacks the strength of association necessary to be considered historically significant in relation to any particular events or persons.

Criterion C/3: The utilitarian building lacks any identifiable architectural stylistic design and does not embody distinctive architectural or engineering qualities of type, period, or method of construction.

Criterion D/4: In rare instances, buildings themselves can serve as sources of important information, but this building is not a principal source of important information in this regard.

Building 120 does not meet the significance criteria for listing in the NRHP or CRHR.

4.2.11 Building 121

Criteria A/1 and B/2: Building 121 does not meet the criteria for listing in the NRHP or CRHR because it lacks historical significance. The structure has been used for vehicle storage throughout its lifetime and lacks the strength of association necessary to be considered historically significant in relation to any particular events or persons.

Criterion C/3: The utilitarian building lacks any identifiable architectural stylistic design and does not embody distinctive architectural or engineering qualities of type, period, or method of construction.

Criterion D/4: In rare instances, buildings themselves can serve as sources of important information, but this building is not a principal source of important information in this regard.

Building 121 does not meet the significance criteria for listing in the NRHP or CRHR.

4.2.12 Building 125

Criterion A/1: No particular association was found between the Building 125 and events significant to national, state, or local history. Although the California Cap Company was the first blasting cap manufacturer in the United States there is no indication that Building 125, a warehouse building, was central to the development of the plant or its technical processes, so the building is not eligible for inclusion in the NRHP or CRHR for historical significance.

Criterion B/2: Although William Letts Oliver and his son Roland Oliver were significant in the history of the explosives industry, no particular association was found between the Oliver family and the building. It lacks the strength of association

necessary to be considered historically significant in relation to any particular persons (Criteria B/2).

Criterion C/3: The building does not embody the distinctive characteristics of a type, period, region, or method of construction, or represent the work of an important creative individual or possess high artistic values (Criterion C/3). Building 125 is a vernacular building of a type commonly constructed from the late nineteenth to the early twentieth century, so the building is not eligible to the NRHP for its architecture.

Criterion D/4: In rare instances, buildings themselves can serve as sources of important information, but this building is not a principal source of important information in this regard (Criterion D/4).

Building 125 does not meet the significance criteria for listing in the NRHP or CRHR.

4.2.13 Building 128

Criterion A/1: Building 128 does not meet the criteria for listing in the NRHP or CRHR because it lacks historical significance. Although the California Cap Company was the first blasting cap manufacturer in the United States there is no indication that Building 128, as a press house, was central to the development of the plant and its technical processes. It has had a variety of uses over its lifetime, so it lacks the strength of association to be considered historically significant in relation to any particular events in national, state, or local history to (Criterion A/1).

Criterion B/2: Although William Letts Oliver and his son Roland Oliver were significant in the history of the explosives industry, no particular association was found between the Oliver family and the building. It lacks the strength of association necessary to be considered historically significant in relation to any particular persons.

Criterion C/3: Building 128 was constructed in a utilitarian style, with materials commonly used in industrial structures during the early twentieth century. Alterations were done and additions were constructed over the years in response to changing needs. It does not embody the distinctive characteristics of a type, period, region, or method of construction, or represent the work of an important creative individual or possess high artistic values.

Criterion D/4: In rare instances, buildings themselves can serve as sources of important information, but this building is not a principal source of important information in this regard.

Building 128 does not meet the significance criteria for listing in the NRHP or CRHR.

4.2.14 Building 149

Criteria A/1 and B/2: Building 149 does not meet the criteria for listing in NRHP or CRHR because it lacks historical significance. The structure has been used for a variety of purposes throughout its lifetime and lacks the strength of association necessary to be considered historically significant in relation to any particular events or persons.

Criterion C/3: The utilitarian building lacks any identifiable architectural stylistic design and does not embody distinctive architectural or engineering qualities of type, period, or method of construction.

Criterion D/4: In rare instances, buildings themselves can serve as sources of important information, but this building is not a principal source of important information in this regard.

Criterion G: As a storage facility, Building 149 does not meet the standard of exceptional importance required for properties less than 50 years old to be eligible to the NRHP.

Building 149 does not meet the significance criteria for listing in the NRHP or CRHR.

4.2.15 Building 150

Criterion A/1: Building 150 meets Criterion A/1 because it is associated with the early explosives industry in the United States. The California Cap company was the oldest blasting manufacturer in the East Bay. Blasting caps, or detonators, were an important safety innovation, invented only a few years before California Cap was opened.¹³¹ Several other explosives factories were opened in Contra Costa County after the Tonite Powder and California Cap companies, and from the 1880s into the twentieth century, the East Bay produced most of the explosives products in California. High-explosive powder and blasting caps were essential to mining, road-building, and other economically important activities in California. These factories also produced munitions that were used during wartime. The manufacturing activities in Building 150, specifically wire insulating and wire saturating, were central to the production processes of the California Cap Company, the first blasting cap company in the United States. Insulated wire was required for blasting caps, one of the primary products of the plant. Building 150 is closely associated with Building 175, the California Cap Company's primary building.

Criterion B/2: Although William Letts Oliver and his son Roland Oliver were significant in the history of the explosives industry, no particular association was found between the Oliver family and the building, so it lacks the strength of association necessary to be considered historically significant in relation to any particular persons.

¹³¹ A detonator is a small explosive charge that ignites a larger charge, allowing for the use of a more stable and thus safer type of explosive.

Criterion C/3: The building does not embody the distinctive characteristics of a type, period, region, or method of construction, or represent the work of an important creative individual or possess high artistic values. Building 150 is a simple industrial building, so it is not eligible to the NRHP or CRHR for its architecture.

Criterion D/4: In rare instances, buildings themselves can serve as sources of important information, but this building is not a principal source of important information in this regard.

Eligibility for listing in either the NRHP or the CRHR rests on significance and integrity. A property must have both factors to be considered eligible. Loss of integrity, if sufficiently great, would overwhelm the historical significance of a resource and render it ineligible. Integrity of a historic resource is measured by applying seven factors: location, design, setting, workmanship, materials, feeling, and association. Building 150 has retained a sufficient level of integrity in all measures. Although the building has undergone alterations, these changes have not compromised its historic integrity. Additional square footage at the rear of the building is not visible from the street, leaving the primary façade's ability to convey its historic significance intact. Furthermore, the main addition to Building 150 was constructed to complement the primary volume of the building in 1946, within the period of significance (1910-1949) for the California Cap Company. Therefore, Building 150 continues to convey its historic significance as a California Cap Company manufacturing facility.

4.2.16 Building 152

Criterion A/1: No particular association was found between the Building 152 and events significant to national, state, or local history. Although the California Cap Company was the first blasting cap manufacturer in the United States there is no indication that the activities that took place in Building 152 were central to the development of the plant or its technical processes. The building has been used for a variety of purposes throughout its lifetime, so the building is not eligible for inclusion in the NRHP or CRHR under this criterion.

Criterion B/2: Although William Letts Oliver and his son Roland Oliver were significant in the history of the explosives industry, no particular association was found between the Oliver family and the building., so it lacks the strength of association necessary to be considered historically significant in relation to any particular persons.

Criterion C/3: The building does not embody the distinctive characteristics of a type, period, region, or method of construction, or represent the work of an important creative individual or possess high artistic values. Building 152 is a vernacular building of a type that was commonly constructed from the late nineteenth to the early twentieth century, so the building is not eligible to the NRHP or CRHR under this criterion.

Criterion D/4: In rare instances, buildings themselves can serve as sources of important information, but this building is not a principal source of important information in this regard.

Building 152 does not meet the significance criteria for listing in the NRHP or CRHR.

4.2.17 Building 153

Criteria A/1 and B/2: Building 153 does not meet the criteria for listing in NRHP or CRHR because it lacks historical significance. The structure has been used for a variety of purposes throughout its lifetime and lacks the strength of association necessary to be considered historically significant in relation to any particular events or persons.

Criterion C/3: The utilitarian building lacks any identifiable architectural stylistic design and does not embody distinctive architectural or engineering qualities of type, period, or method of construction.

Criterion D/4: In rare instances, buildings themselves can serve as sources of important information, but this building is not a principal source of important information in this regard.

Building 153 does not meet the significance criteria for listing in the NRHP or CRHR.

4.2.18 Building 163

Criteria A/1 and B/2: Building 163 does not meet the criteria for listing in NRHP or CRHR because it lacks historical significance. The structure has been used for research throughout its lifetime and lacks the strength of association necessary to be considered historically significant in relation to any particular events or persons.

Criterion C/3: The utilitarian building lacks any identifiable architectural stylistic design and does not embody distinctive architectural or engineering qualities of type, period, or method of construction.

Criterion D/4: In rare instances, buildings themselves can serve as sources of important information, but this building is not a principal source of important information in this regard.

Criterion G: As a research facility Building 163 does not meet the standard of exceptional importance required for properties less than 50 years old to be eligible to the NRHP.

Building 163 does not meet the significance criteria for listing in the NRHP or CRHR.

4.2.19 Building 175

Criterion A/1: Building 175 meets Criterion A/1 because it is associated with the early explosives industry in the United States, as it was part of the first blasting cap company in the United States. The California Cap company was also the oldest blasting manufacturer in the East Bay area. Blasting caps, or detonators, were an important safety innovation, invented only a few years before California Cap was opened.¹³² Several other explosives factories were opened in Contra Costa County after the Tonite Powder and California Cap companies, and from the 1880s into the twentieth century, the East Bay produced most of the explosives products in California. High-explosive powder and blasting caps were essential to mining, road-building, and other economically important activities in California. These factories also produced munitions that were used during wartime.

The manufacturing activities in Building 175, specifically cartridge loading and cartridge production, were central to the production processes of the Pacific Cartridge Company and the California Cap Company. Building 175 was one of the plant's primary manufacturing buildings in the 1910s. The company was administered from the office in the building. The building is at what was the geographical center of the plant between 1900 and the 1940s, and it is featured in historic photographs as the Pacific Cartridge and the California Cap Company's primary building.

Criterion B/2: Although William Letts Oliver and his son Roland Oliver were significant in the history of the explosives industry, no particular association was found between the Oliver family, the architect or builder, or any person associated with the building, so it lacks the strength of association necessary to be considered historically significant in relation to any particular persons under Criterion B/2.

Criterion C/3: The building does not embody the distinctive characteristics of a type, period, region, or method of construction, or represent the work of an important creative individual or possess high artistic values. Building 175 is an industrial building with little ornamentation, so it is not eligible to the NRHP or CRHR under this criterion.

Criterion D/4: In rare instances, buildings themselves can serve as sources of important information, but this building is not a principal source of important information in this regard.

Eligibility for listing on either the NRHP or the CRHR rests on significance and integrity. A property must have both factors to be considered eligible. Loss of integrity, if sufficiently great, would overwhelm the historical significance of a resource and render it ineligible. Integrity of a historic resource is measured by applying seven factors: location, design, setting, workmanship, materials, feeling, and association. Building 175 retains a

¹³² A detonator is a small explosive charge that ignites a larger charge, allowing for the use of a more stable and thus safer type of explosive.

sufficient level of integrity in all measures. Although the building has undergone alterations, including the additional square footage constructed at the rear of the building, this addition is not visible from the street, leaving the primary façade intact. The replacement of the original wood frame sashes affects the building's integrity of design and materials. However, as demonstrated by a comparison of photographs taken in 2013 (Photograph 27) and ca. 1910 (Photograph 28), Building 175 is easily recognizable from historic photographs from the California Cap Company era. Despite some alterations, the building retains its ability to convey its significance as the company's historic administration building, and thus retains sufficient integrity to be considered eligible.

4.2.20 Building 176

Criteria A/1 and B/2: Building 176 does not meet the criteria for listing in NRHP or CRHR because it lacks historical significance. The structure has been used for storage throughout its lifetime and lacks the strength of association necessary to be considered historically significant in relation to any particular events or persons.

Criterion C/3: The utilitarian building lacks any identifiable architectural stylistic design and does not embody distinctive architectural or engineering qualities of type, period, or method of construction.

Criterion D/4: In rare instances, buildings themselves can serve as sources of important information, but this building is not a principal source of important information in this regard.

Building 176 does not meet the significance criteria for listing in the NRHP or CRHR.

4.2.21 Building 178

Criteria A/1 and B/2: Building 178 does not meet the criteria for listing in the NRHP or CRHR because it lacks historical significance. The structure has had a variety of uses throughout its lifetime and lacks the strength of association necessary to be considered historically significant in relation to any particular events or persons.

Criterion C/3: The utilitarian building lacks any identifiable architectural stylistic design and does not embody distinctive architectural or engineering qualities of type, period, or method of construction.

Criterion D/4: In rare instances, buildings themselves can serve as sources of important information, but this building is not a principal source of important information in this regard.

Criterion G: As a multiple use building, Building 178 does not meet the standard of exceptional importance required for properties less than 50 years old to be eligible to the NRHP (Criterion G).

Building 178 does not meet the significance criteria for listing in the NRHP or CRHR.

4.2.22 Building 185

Criteria A/1 and B/2: Building 185 does not meet the criteria for listing in NRHP or CRHR because it lacks historical significance. The structure has been used for a variety of purposes throughout its lifetime and lacks the strength of association necessary to be considered historically significant in relation to any particular events or persons.

Criterion C/3: The utilitarian building lacks any identifiable architectural stylistic design and does not embody distinctive architectural or engineering qualities of type, period, or method of construction.

Criterion D/4: In rare instances, buildings themselves can serve as sources of important information, but this building is not a principal source of important information in this regard.

Criterion G: As a multiple use building, Building 185 does not meet the standard of exceptional importance required for properties less than 50 years old to be eligible to the NRHP under this criterion.

Building 185 does not meet the significance criteria for listing in the NRHP or CRHR.

4.2.23 Building 197

Criteria A/1 and B/2: Building 197 does not meet the criteria for listing in NRHP or CRHR because it lacks historical significance. The structure has had a variety of uses throughout its lifetime and lacks the strength of association necessary to be considered historically significant in relation to any particular events or persons.

Criterion C/3: The utilitarian building lacks any identifiable architectural stylistic design and does not embody distinctive architectural or engineering qualities of type, period, or method of construction.

Criterion D/4: In rare instances, buildings themselves can serve as sources of important information, but this building is not a principal source of important information in this regard.

Criterion G: As a storage facility, Building 197 does not meet the standard of exceptional importance required for properties less than 50 years old to be eligible under this criterion.

Building 197 does not meet the significance criteria for listing in the NRHP or CRHR.

4.2.24 Building 275

Criteria A/1 and B/2: Building 275 does not meet the criteria for listing in NRHP or CRHR because it lacks historical significance. The structure has been used for research throughout its lifetime and lacks the strength of association necessary to be considered historically significant in relation to any particular events or persons.

Criterion C/3: The utilitarian building lacks any identifiable architectural stylistic design and does not embody distinctive architectural or engineering qualities of type, period, or method of construction.

Criterion D/4: In rare instances, buildings themselves can serve as sources of important information, but this building is not a principal source of important information in this regard.

Building 275 does not meet the significance criteria for listing in the NRHP or CRHR.

4.2.25 Building 276

Criterion A/1 and B/2: Building 276 does not meet the criteria for listing in the NRHP or CRHR because it lacks historical significance. The structure has been used for research throughout its lifetime and lacks the strength of association necessary to be considered historically significant in relation to any particular events (Criterion A/1 or persons B/2).

Criteria C/3 and D/4: The utilitarian building lacks any identifiable architectural stylistic design and does not embody distinctive architectural or engineering qualities of type, period, or method of construction (Criterion C/3). In rare instances, buildings themselves can serve as sources of important information, but this building is not a principal source of important information in this regard (Criterion D/4).

Building 276 does not meet the significance criteria for listing in the NRHP or CRHR.

4.3 HISTORIC EVALUATION OF BUILDINGS IN THE INDIRECT APE

The buildings over 45 years old adjacent to the Phase 1 footprint, in the indirect APE, were evaluated for their historic significance and determined ineligible for listing in the NRHP or CRHR.

4.3.1 Building 151

Criterion A/1 and B/2: Building 151 does not meet the criteria for listing in NRHP or CRHR under Criterion A/1 because it lacks historical significance. The historical record does not indicate that Building 151 was important in local, state, or national events or trends. While academic research is important to anyone directly involved in the field, the historical record must show that the research or studies had a significant

impact on historical events and trends. The SWCL and Building 151 are not significant in this regard (Criterion A/1). None of the persons associated with Building 151 had a significant impact on local, state, or national history. Therefore, the building lacks the strength of association necessary to be considered historically significant in relation to any particular persons (Criterion B/2).

Criterion C/3 and D/4: Building 151 lacks any identifiable architectural stylistic design and does not embody distinctive architectural or engineering qualities of type, period, or method of construction and is a simple, prefabricated building (Criterion C/3). In rare instances, buildings themselves can serve as sources of important information; however, this building is not a principal source of important information in this regard (Criterion D/4).

Building 151 does not meet the significance criteria for listing in the NRHP or CRHR.

4.3.2 Building 154

Criterion A/1 and B/2: Building 154 does not meet the criteria for listing in NRHP or CRHR under Criterion A/1 because it lacks historical significance. The historical record does not indicate that Building 154 was important in local, state, or national events or trends. While academic research is important to anyone directly involved in that field, in order to be eligible for the NRHP or CRHR, the historical record must show that the research or studies had a significant impact on historical events and trends. The SWCL and Building 154 are not significant in this regard. None of the persons associated with Building 154 had a significant impact on local, state, or national history. Therefore, the building lacks the strength of association necessary to be considered historically significant in relation to any particular persons (Criterion B/2).

Criterion C/3 and D/4: Building 154 lacks any identifiable architectural stylistic design and is a simple prefabricated building. It does not embody distinctive architectural or engineering qualities of type, period, or method of construction (Criterion C/3). In rare instances, buildings themselves can serve as sources of important information; however, this building is not a principal source of important information in this regard (Criterion D/4).

Building 154 does not meet the significance criteria for listing in the NRHP or CRHR.

4.3.3 Building 155

Criterion A/1 and B/2: although the Olivers were significant in the history of the explosives industry, no particular association was found between the Oliver family and Building 155. Although the structure was used for University research by Professor Howe and others throughout its lifetime, none of the available historical evidence suggests that the building has association with persons important to the development of the desalination field. Academic research is important to those working directly in that

specific field, however none of the persons associated with Building 155 had a significant impact on local, state, or national history. The building lacks the strength of association necessary to be considered historically significant in relation to any particular persons (Criterion B/2).

Criterion C/3 and D/4: the building does not embody the distinctive characteristics of a type, period, region, or method of construction, or represent the work of an important creative individual or possess high artistic values. Building 155 is a vernacular building of a type that was commonly constructed in the early twentieth century. It has been heavily altered over the years since the University took possession in 1950, so the building is not eligible for the NRHP or CRHR for its architecture (Criterion C/3). In rare instances, buildings themselves can serve as sources of important information; however, this building is not a principal source of important information (Criterion D/4).

Building 155 does not meet the significance criteria for listing in the NRHP or CRHR.

4.3.4 Building 158

Criterion A/1 and B/2: Building 158 does not meet the criteria for listing in the NRHP or CRHR under Criterion A/1 because it lacks historical significance. The historical record does not indicate that Building 158 was important in local, state, or national events or trends. While academic research is important to anyone directly involved in the field, the historical record must show that the research or studies had a significant impact on historical events and trends in order to be eligible for the NRHP or CRHR. Building 158 is not significant in this regard (Criterion A/1). Although the structure was used for University research by Professor Howe and others throughout its lifetime, none of the available evidence suggests that the building has association with persons important to the development of the desalination field. None of the persons associated with Building 158 have had a significant impact on local, state, or national history. Therefore, the building lacks the strength of association necessary to be considered historically significant in relation to any particular persons (Criterion B/2).

Criterion C/3 and D/4: Building 158 lacks any identifiable architectural stylistic design and does not embody distinctive architectural or engineering qualities of type, period, or method of construction (Criterion C/3). In rare instances, buildings themselves can serve as sources of important information; however, this building is not a principal source of important information in this regard (Criterion D/4).

Building 158 does not meet the significance criteria for listing in the NRHP or CRHR.

4.3.5 Building 177

Criterion A/1 and B/2: no association was found between Building 177 and events significant to national, state, or local history (Criterion A/1). Although the California Cap Company was the first blasting cap manufacturer in the United States, there is no

indication that the activities that took place in Building 177 were central to the development of the plant or its technical processes. Academic research took place in the building after the University took over the property, and while academic research is important to anyone directly involved in the field, the historical record must show that the research or studies had a significant impact on historical events and trends in order to merit eligibility in the NRHP or CRHR. The historical record does not indicate that Building 177 is eligible in this regard under Criterion A/1. Although the Olivers were significant in the history of the explosives industry, no particular association was found between the Oliver family and the building. Although Building 177 was used for University research by Professor Howe and others throughout its lifetime, none of the available evidence suggests that the building has association with persons important to the development of the desalination field. As stated, academic research is important to those working directly in that specific field; however, none of the persons associated with Building 177 had a significant impact on local, state, or national history. Therefore, the building lacks the strength of association necessary to be considered historically significant in relation to any particular persons (Criterion B/2).

Criterion C/3 and D/4: the building does not embody the distinctive characteristics of a type, period, region, or method of construction, or represent the work of an important creative individual or possess high artistic values. Building 177 is a vernacular building of a type that was commonly constructed in the early twentieth century. It has been heavily altered over the years since the University took possession in 1950, and the building is not eligible for listing in the NRHP or CRHR for its architecture (Criterion C/3). In rare instances, buildings themselves can serve as sources of important information; however, this building is not a principal source of important information in this regard (Criterion D/4).

Building 177 does not meet the significance criteria for listing in the NRHP or CRHR

4.3.6 Building 180

Criterion A/1 and B/2: no association was found between Building 180 and events significant to national, state, or local history (Criterion A/1). Although the California Cap Company was the first blasting cap manufacturer in the United States, there is no indication that the activities that took place in Building 180 were central to the development of the plant or its technical processes. The building is not eligible for inclusion in the NRHP or CRHR for historical significance (Criterion A/1). Although the Olivers were significant in the history of the explosives industry, no particular association was found between the Oliver family and the building. The building was used for University research by Professor Howe and others throughout its lifetime; however, none of the available historical evidence suggests that the building has association with persons important to local, state, or national history. None of the persons associated with Building 180 have the strength of association necessary to be considered eligible under Criterion B/2.

Criterion C/3 and D/4: the building does not embody the distinctive characteristics of a type, period, region, or method of construction, or represent the work of an important creative individual or possess high artistic values. Building 180 is a combination of five buildings joined to make one building complex and has alteration dates from 1930 through 1950. The building is not eligible for the NRHP or CRHR for its architecture (Criterion C/3). In rare instances, buildings themselves can serve as sources of important information; however, this building is not a principal source of important information in this regard (Criterion D/4).

Building 180 does not meet the significance criteria for listing in the NRHP or CRHR.

4.3.7 Building 277

Criterion A/1 and B/2: Building 277 does not meet the criteria for listing in NRHP or CRHR because it lacks historical significance. The structure has primarily been used for storage throughout its lifetime and lacks the strength of association necessary to be considered historically significant in relation to any particular events or persons (Criteria A/1 and B/2).

Criterion C/3 and D/4: the utilitarian building lacks any identifiable architectural stylistic design and does not embody distinctive architectural or engineering qualities of type, period, or method of construction (Criterion C/3). In rare instances, buildings themselves can serve as sources of important information, but this building is not a principal source of important information (Criterion D/4).

Building 277 does not meet the significance criteria for listing in the NRHP or CRHR.

4.4 PERIOD OF SIGNIFICANCE FOR ANY ELIGIBLE RESOURCES

The California Cap Company operated on the site from 1877 – 1949. Although its most innovative products have been created during the nineteenth century, the plant produced cartridges during World War I and incendiary bombs during World War II. Prior to World War II, it was one of the most important local employers in Richmond. Buildings 150 and 175 were constructed in 1910 and used for the California Cap Company until 1949, when the Cap Company ceased production. The period of significance for these buildings is from their construction in 1910 until 1949, when they were no longer used for the explosives industry.

5. CONCLUSION

This report concludes that there are two buildings, Buildings 150 and 175, which are eligible for listing in the NRHP and the CRHR for their association with the California Cap Company. These two buildings could be significantly adversely impacted by demolition, alteration, removal, or a change in their historic setting. Any future projects should be analyzed to ensure that these buildings are not significantly impacted, and if there is a significant adverse impact, mitigation measures should be implemented to reduce that impact.

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7. PREPARER'S QUALIFICATIONS

Tetra Tech Historian/Architectural Historian Kara Brunzell meets the history and architectural history professional qualifications, as outlined by the federal government in Title 36, Code of Federal Regulations, Part 61. She has an MA in History/Public History from California State University, Sacramento.

Tetra Tech Historian/Architectural Historian Julia Mates meets the history and architectural history professional qualifications, as outlined by the federal government in Title 36, Code of Federal Regulations, Part 61. She has an MA in History/Public History from California State University, Sacramento.

APPENDIX A

DPR 523 FORMS

BUILDINGS IN THE DIRECT APE

State of California – The Resources Agency
DEPARTMENT OF PARKS AND RECREATION
PRIMARY RECORD

Primary # _____
HRI # _____
Trinomial _____
NRHP Status Code _____

Other Listings _____
Review Code _____ Reviewer _____ Date _____

Page 1 of 11

*Resource Name or # (Assigned by recorder) Richmond Field Station Building 102

P1. Other Identifier: Richmond Field Station Building 102

*P2. Location: Not for Publication Unrestricted

*a. County Contra Costa

and (P2b and P2c or P2d. Attach a Location Map as necessary.)

*b. USGS 7.5' Quad Richmond Date 1984 T ; R _____ ; ¼ of Sec _____ ; Diablo B.M.

c. Address _____ City _____ Zip _____

d. UTM: (give more than one for large and/or linear resources) Zone 10 ; 558491 mE/ 4196289 mN

e. Other Locational Data: (e.g., parcel #, directions to resource, elevation, etc., as appropriate) Assessor Parcel Number

*P3a. Description: (Describe resource and its major elements. Include design, materials, condition, alterations, size, setting, and boundaries)

Building 102 is near the southern edge of the Richmond Field Station campus. It is situated at the intersection of Heron Drive and Egret Way with its primary façade facing southeast. The 6,737 square foot building is single story with an irregular plan. It was constructed circa 1860 and is currently used for research. The building has been altered over its lifetime.

Originally, Building 102 was a produce warehouse with a rectangular plan at the corner of Heron Drive and Egret Way. When the Tonite Powder and California Cap companies were constructed along the waterfront in 1877 the warehouse served as a crucial safety barrier between explosive powder and detonators. (See Continuation Sheet)

*P3b. Resource Attributes: (List attributes and codes) HP15: Educational building, HP39: Other

*P4. Resources Present: Building Structure Object Site District Element of District Other (Isolates, etc.)



P5b. Description of Photo: (View, date, accession #) Photograph 1 camera facing west, January 4, 2013.

*P6. Date Constructed/Age and Sources:

Historic Prehistoric Both

Circa 1860s

*P7. Owner and Address:

U.C. Berkeley

1301 South 46th Street

Richmond, California 94804

*P8. Recorded by: (Name, affiliation, address)

Kara Brunzell & Julia Mates

Tetra Tech

1999 Harrison Street, Ste 500

Oakland, CA 94612

*P9. Date Recorded: January 4, 2013

*P10. Survey Type: (Describe) Intensive

*P11. Report Citation: (Cite survey report and other sources, or enter "none.") Historic Properties Survey Report for Portions of the

Richmond Field Station prepared by Tetra Tech, Inc. 2013.

*Attachments: NONE Location Map Sketch Map Continuation Sheet Building, Structure, and Object Record Archaeological Record District Record Linear Feature Record Milling Station Record Rock Art Record Artifact Record Photograph Record Other (list) _____

*Resource Name or # (Assigned by recorder) Richmond Field Station Building 102

B1. Historic Name: California Cap Company Building 30

B2. Common Name: Building 102

B3. Original Use: Produce warehouse B4. Present Use: Research

*B5. Architectural Style: Vernacular

*B6. Construction History: (Construction date, alteration, and date of alterations) Constructed circa 1860; 1877: Converted from warehouse to explosives manufacturing facility; Circa 1930: Additions to rear of building; Circa 1950: Further additions to rear of building; Circa 1970s: Façade renovation, flat roof installed

*B7. Moved? No Yes Unknown Date: _____ Original Location: _____

*B8. Related Features: _____

B9. Architect: Unknown b. Builder: Unknown

*B10. Significance: Theme History Area Richmond Field Station

Period of Significance 1877 - 1949 Property Type industrial Applicable Criteria 1/A

(Discuss importance in terms of historical or architectural context as defined by theme, period, and geographic scope. Also address integrity.)

Building 102 at Richmond Field Station does not appear to meet the criteria for listing in the National Register of Historic Places (NRHP). Furthermore, the building has been evaluated in accordance with Section 15064.5(a)(2)-(3) of the CEQA Guidelines, using the criteria outlined in Section 5024.1 of the California Public Resources Code, and does not appear to meet the significance criteria as outlined in these guidelines. Therefore, the building is not eligible for listing in the California Register of Historical Resources (CRHR). (See Continuation Sheet)

B11. Additional Resource Attributes: (List attributes and codes)

*B12. References:

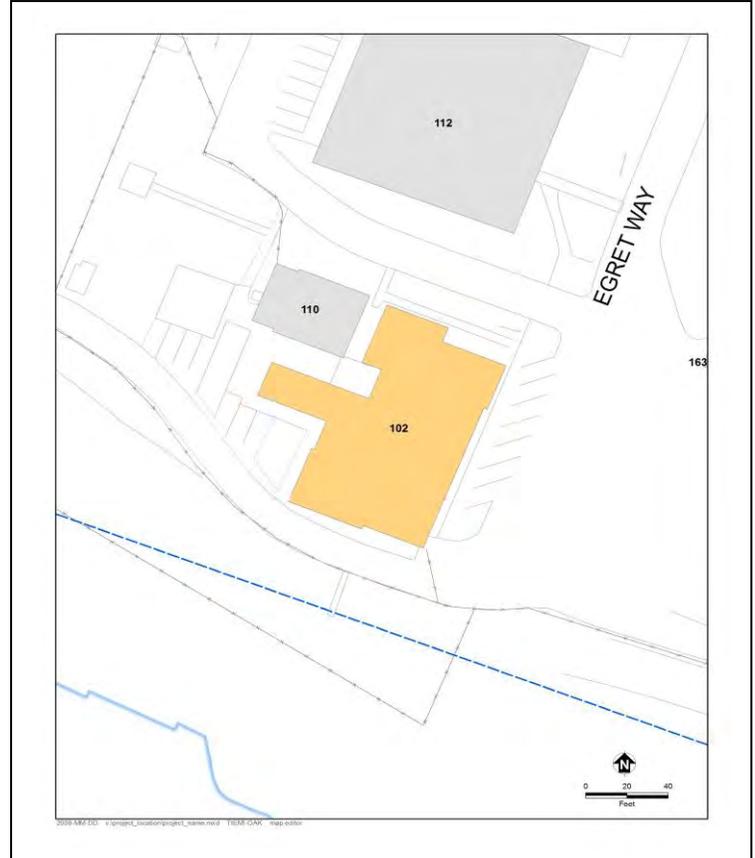
(See Footnotes)

B13. Remarks:

*B14. Evaluator: Kara Brunzell

*Date of Evaluation: January 2013

(This space reserved for official comments.)



Page 3 of 11 *Resource Name or # (Assigned by recorder) Richmond Field Station Building 102

*Recorded by Tetra Tech

*Date January 4, 2013 Continuation Update

P3a. Description (continued)

Agriculture continued to be an important local activity after the establishment of the plants, and through the 1880s produce was stored in the warehouse along with explosives.¹ As the Tonite and California Cap Companies grew they crowded out agriculture, and the building was taken over by California Cap. By 1912 the company had its can factory as well as its warehouse in the building.² The California Cap Company referred to the building as Building 30. The California Cap Company constructed additional space on the northwest side of the building during the 1930s. During World War II the building housed an assembly line for incendiary delayed action bombs.³

After UC Berkeley's Department of Engineering took over the site in 1950 Sanitary Engineering Research Laboratory (SERL) activities were centered in and around Building 102. Professor H.B. Gotaas was in charge of SERL research during the early 1950s. Projects included both studies on composting, incineration, water reclamation, algae symbiosis, saltwater intrusion, and radioactive waste disposal.⁴ In addition to laboratories, Building 102 housed SERL's library and administrative offices. The Department altered the interior of the building to suit its purposes, and by the mid-1950s it housed "an unusually well-equipped chemistry and biology laboratory".⁵

Historic photographs indicate that the original building was side gabled, with its primary façade on Egret Way. The University made additions on the building four times after 1950, including construction of an addition projecting from the primary façade that has since been removed (Photograph 2 and Photograph 3).⁶ Alterations to the façade appear to have been made during the 1970s, when a flat roof replaced the original gabled roof over the southeast wing of the building. Facades on Egret and Heron Drive were altered with the replacement of stucco siding instead of wood and aluminum sash windows. In 2013 the building uses include storage, a bioengineering offices, and wet chemistry laboratory.

The primary volume of the building, which is adjacent to the corner of Heron Drive and Egret Way, is topped with a flat roof. Sections of the building to the rear are topped with shed roofs. The primary (southeast) façade features a broad eave overhang with large exposed roof members. The roof beams rest on large plain columns. (Many of these columns show signs of moderate to severe deterioration). The building is clad in both stucco with wood trim and horizontal wood siding. Fenestration consists of a combination of aluminum sliding sashes and double-hung, multi-light, wood frame sashes. Three entryways on the primary elevation are at grade through metal industrial-type doors, two of which have windows. Another elevation features a wood paneled door with a window.

The building currently reflects the many changes of use and alterations performed over the years in its irregular footprint and multiple types of siding and fenestration (Photograph 4 and Photograph 5).

¹ Roland Oliver, "Recollections of Early Industries in Stege", August 7, 1959, p.1.

² Sanborn Insurance Maps, Stege, California. 1912.

³ Oliver, p. 1.

⁴ University of California, Berkeley, Department of Engineering, "Richmond Field Station Open House", May 28, 1952, p. 1.

⁵ University of California, Berkeley, Department of Engineering, "Guide for Engineering Field Station Inspection", undated, p. 7.

⁶ Scott Shackleton, University of California, Berkeley, Personal communication with Julia Mates, Tetra Tech 2013.

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B10. Significance (continued)

Historic Context

Europeans arrived in what would become Contra Costa County in 1772, when a Spanish expedition led by Pedro Fages discovered the San Pablo Bay and the confluence of the Sacramento and San Joaquin rivers.⁷ Though subsequent Spanish expeditions passed through the region the Spanish do not appear to have settled in the area during the mission period. In the 1820s and 1830s the Mexican government began granting large tracts of land in the area to its citizens, including Ranchos San Pablo, San Ramon, and Pinole. The first permanent non-native settlers were Francisco Castro and his wife Maria Gabriela Berryessa. The Mexican government granted the 18,000 acre Rancho San Pablo to the Castros in 1823.⁸ Americans began farming in Contra Costa County in the late 1830s, and by 1882 2/3 of the cultivated land in the county was devoted to wheat production.⁹

Minna C. C. Quilfelt (or Quilfeldt) purchased 600 acres of Rancho San Pablo in 1852 and 1853.¹⁰ Adjacent to San Francisco Bay in what would eventually become the southern portion of the City of Richmond, a wharf and produce warehouse were constructed on the ranch in the 1860s to ship agricultural produce to the San Francisco markets from Rancho San Pablo as well as the Quilfelt ranch. The warehouse and wharf were used to transport cattle, grain, fruit, and in later years the frogs' legs raised by Richard Stege for the San Francisco restaurant market.¹¹ German native Richard Stege settled on Rancho San Pablo in the late 1860s after stints in the gold fields and the Siberian fur trade. He married Minna Quilfelt, who was a widow, in 1870.¹² Minna Quilfelt Stege died in 1879, leaving the ranch to Stege and her daughter Edith. Stege began selling off portions of his ranch to raise money while continuing his frog-raising and other ventures. A town named Stege formed on Richard Stege's holdings, and by the late nineteenth century several industries, including the California Cap Works, the United States Briquette Company, the Stauffer Chemical Works and the Stege Lumber Manufacturing Company, were operating from portions of the Stege Ranch.¹³ Richmond incorporated in 1905, and by 1917 was already the largest city in Contra Costa County.¹⁴ Stege was eventually absorbed into Richmond as the latter grew.

The Explosives Industry in Contra Costa County

Swedish chemist Alfred Nobel laid the foundation for the high-explosives industry with his innovations beginning in 1860s, inventing first a detonator and then a blasting cap. In 1867 he invented dynamite, which was safer, cheaper, and more powerful than nitroglycerine, which had been the most commonly used explosive. Nobel licensed the Giant Powder Company to produce dynamite in California later that year. Giant was the first American company to produce dynamite, and its plant was initially located in Rock House Canyon, in what is

⁷ Mildred B. Hoover, Hero E. Rensch, Ethel G. Rensch, Douglas E. Kyle, *Historic Spots in California, Fourth Edition*, Stanford University Press, Stanford, California: 1958, p. 129.

⁸ Donald Bastin, *Images of America: Richmond*, Arcadia Publishing, Charleston SC: 2003, p. 9.

⁹ J.P. Munro-Fraser, *History of Contra Costa County, California*, W.A. Slocum & Co., San Francisco: 1882, p. 55 – 57.

¹⁰ Evan Griffins, "Early History of Richmond", December 1938, El Cerrito Historical Society, website: <http://www.elcerritowire.com/history/pages/EarlyRichmond.htm>, accessed January 2013.

¹¹ Roland Oliver, "Recollections of Early Industries in Stege", August 7, 1959, p. 1.

¹² J.P. Munro-Fraser, p. 675.

¹³ Frederick J. Hulaniski, *The History of Contra Costa County, California*. Elms Publishing Company, Berkeley, California: 1917, p. 354.

¹⁴ Hulaniski p. 288.

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B10. Significance (continued)

today the City of San Francisco. The California Powder Works began manufacturing dynamite in the same area in 1869.¹⁵

The nineteenth century explosives industry was extremely dangerous, and as San Francisco's population grew explosives manufacturers needed to relocate. Contra Costa County across the bay was attractive since it was accessible due to its proximity to the harbor yet remote from population centers. In addition, the narrow canyons of Contra Costa County, which terminate in small bays, provided a natural geographical defense against explosions by allowing factory design that placed water between different facets of explosives manufacturing.¹⁶

During the 1870s chemical and explosives manufacturers began opening in the vicinity of what would eventually become Richmond. The Tonite Powder Company, Western Mineral Company, and California Cap Company were established at 1877 on the Stege ranch. The San Francisco explosives companies soon followed those explosive companies across the bay to Contra Costa County. In 1880, Giant relocated to Point Pinole, changing its name to the Atlas Powder Company. The California Powder Works soon followed, building a new factory in Hercules, which was named for the brand under which the company sold its powder.¹⁷ The Vulcan Powder Works and Judson Powder works also opened in the Stege Ranch area during this era, consolidating Contra Costa County's position as the cradle of the California explosives industry. The East Bay dominated California explosives manufacturing into the twentieth century. In 1902 California had only one powder factory outside Contra Costa and Alameda counties.¹⁸

William Letts Oliver

William Letts Oliver was born in Chile to English parents in 1844. He attended the University of Edinburgh and became a mining engineer. After returning to Chile, Oliver ran an explosives factory, which was nationalized by the Chilean government in 1864. After the loss of his factory, Oliver left Chile for San Francisco.¹⁹ William Letts Oliver and his wife Carrie lived in Oakland, from about 1880 until Oliver's death in 1918.²⁰ The couple eventually had six children together: Roland, Edwin, Caroline, Anita, William Harold, and Albert.²¹ In addition his various professional activities William Letts Oliver was a yachtsman and an officer of the Bohemian Grove club in the early twentieth century. An avid amateur photographer throughout his lifetime, UC Berkeley's Bancroft Library has a collection of 2700 negatives and prints taken by Oliver and his son.²²

¹⁵ Ida Mae Purcell, *History of Contra Costa County*, The Gillick Press, Berkeley, California" 1940, p. 645 – 646.

¹⁶ James E. Vance, *Geography and Urban Evolution in the San Francisco Bay Area*, University of California, Berkeley: 1964, p. 27.

¹⁷ Purcell, p. 646.

¹⁸ Richmond Record, "Contra Costa County: Under the Vitascope", Richmond:1902.

¹⁹ Pacific Mining News, Supplement to Engineering & Mining Journal-Press, "Industrial Notes: Developing of the Blasting Cap Industry", Vol. 1, No. 7, November 1922, p. 222.

²⁰ United States Census Bureau, Tenth Census of the United States, 1880, National Archives and Records Administration, Washington, D.C., San Francisco, California, Roll: 79, Film: 1254079, Page: 170B.

²¹ United States Census Bureau, Twelfth Census of the United States, 1900, National Archives and Records Administration, Washington, D.C., Oakland Ward 3, Alameda, California, Roll: 82, Page: 13A.

²² Online Archive of California, "Guide to the Oliver Family Photograph Collection", UC Berkeley: 2009, website: <http://www.oac.cdlib.org/findaid/ark:/13030/ft0q2n99r1/> accessed February, 2013.

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B10. Significance (continued)

William Letts Oliver initially gained familiarity with an explosive called guncotton while manufacturing collodion for his photography hobby.²³ As early as 1870, European explosive companies were experimenting with nitrated guncotton in and by 1875 it was manufactured in England under the name “tonite.”²⁴ By 1877 Oliver had left Chile and was mining in the western United States. Engineers working on the Sutro Tunnel in the Comstock needed an explosive that would remain stable at the high temperatures underground to complete the tunnel, and Oliver was able to solve the problem by substituting tonite for more volatile compounds.²⁵

The California Cap Company

In 1877 William Letts Oliver was inspired by his success with tonite to leave mining and establish the Tonite Powder Company, on a portion of the former Stege Ranch.²⁶ In the 1870s all blasting caps in the United States had to be imported from Europe. Not only were they expensive, but the timing of deliveries was uncertain, creating business difficulties for the powder plant. Oliver was determined to create his own caps in order to protect the tonite factory business. He experimented until he came up with a blasting cap that was safer to use and had better detonating qualities than imported detonators. Oliver and his partner Freeborn Fletter founded the California Cap Company. It was located adjacent to the Tonite Powder Company a 160 acre parcel carved out of the southern portion of Stege Ranch.²⁷ California Cap Company, which went on to operate on the site for nearly seven decades, was the first manufacturer of blasting caps in the United States. Richard Stege, meanwhile, continued to reside on the ranch, and contracted with Tonite Powder and California Cap to transport their products to the railroad.²⁸ The California Cap Company was located on the parcel that is currently the Richmond Field Station. The Tonite Powder Company appears to have been located to the east on the parcel that became the Stauffer Chemical Company and later the Zeneca site, although its exact location is unclear.

The Tonite and California Cap factories, which were the first of several gunpowder and chemical companies in the region, were separated by the Stege agricultural warehouse for safety.²⁹ The explosives industry during this era was an extremely dangerous one. A horrific explosion in 1882 at the nearby Vulcan Powder Company caused 11 deaths and destroyed the plant.³⁰ Between 1882 and 1918 the Hercules and Atlas plants suffered numerous explosions which destroyed plant buildings and killed a total of 64 workers.³¹ Despite its focus on safety, the California Cap Company had accidents as well. Two of its Chinese workers were killed in 1917 when one of them dropped a tray of caps. In 1941 an explosion caused a fire and critically injured a worker.³²

²³ Pacific Mining News, p. 222.

²⁴ G.A. Price Cuxson, ed., “Society of Engineers: Transactions for 1889”, E. & F. N. Spon, London: 1890, p. 95.

²⁵ Pacific Mining News, p. 222.

²⁶ Oliver, p. 1.

²⁷ Pacific Mining News, p. 222.

²⁸ Nilda Rego, “Enterprising Stege lost all and died without a penny”, Time Out, March 27, 1994, p. 2, column 4.

²⁹ Oliver, p. 1.

³⁰ Munro-Fraser, p. 424.

³¹ Purcell, p. 648.

³² Contra Costa County Standard, “Stege Powder Plant Blast; One Near Death”, June 6, 1941, p. 1A.

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William Letts Oliver continued to innovate throughout his long career in the chemical and explosives industries. In 1888 he formed the American Lucol Company adjacent to the California Cap Company property.³³ The Lucol plant was at what is currently the southeastern corner of the Richmond Field Station, at the approximate location of Building 163. Lucol manufactured a linseed oil substitute.³⁴ The factory was dismantled and relocated to New Jersey circa 1900.³⁵ In 1903 the Hotaling Briquette Works opened on Lucol's site at the southeast corner of the current Richmond Field station property.³⁶ Later known as the U.S. Briquette Company, the plant appears to have operated at this location until at least 1917.³⁷ The U.S. Briquette Company buildings were demolished sometime in the 1960s.

The Oliver family aggressively promoted their products both through advertising and publishing. The California Cap Company sponsored or published both articles and book-length treatises on the use of explosives. Safety was a key element of the company image, a topic of company-sponsored technical writing as well as a selling point in advertisements.³⁸ The Tonite Powder Company's product was known even outside the United States, and by the end of the nineteenth century the powder's explosive properties were considered comparable to the finest English products.³⁹ Oliver's sons Roland and Edwin Letts Oliver both graduated from UC Berkeley's College of Mining in 1900. Roland Oliver seems to have spent his entire career working in the family enterprises, while Edwin worked at California Cap between mining and other ventures. The Oliver family also became benefactors of the university, and in 1917 the California Cap Company donated substantial amounts of their products to the College of Mining including 500 electric detonators, 500 delayed action exploders, and 500 blasting caps.⁴⁰

Eventually the Tonite factory appears to have been incorporated into the California Cap Company. The Olivers also formed an entity named Pacific Cartridge Company circa 1910. The Pacific Cartridge Company operated from the California Cap plant during World War I.⁴¹ By 1916 there were at least a dozen buildings on the site. When Oliver died in 1918 his son Roland Oliver took over as president of California Cap Company. By 1922 Roland's brother Leslie Oliver was assistant manager of the plant and Edwin Letts Oliver was a director.⁴² Roland Oliver substantially expanded the California Cap Company after he took over as president. During this era the plant grew to include 150 buildings and a horse-drawn tram line.⁴³

During the late nineteenth and early twentieth century the California Cap Company was one of the most important local employers.⁴⁴ As the twentieth century progressed more heavy industry came to Contra Costa County, and by

³³ Oliver, p. 1.

³⁴ Max Wilhelm Von Bernewitz, *Cyanide Practice, 1910 – 1913*, Dewey Publishing Company: 1913, p. 327.

³⁵ Oliver, p. 1.

³⁶ Oliver, p. 2.

³⁷ Hulanski, p. 354.

³⁸ Halbert Powers Gillette, *Rock Excavation: Methods and Cost*, M.C. Clark, New York: 1904, x.

³⁹ Manual Eissler, *A Handbook on Modern Explosives*, Crosby, Lockwood & son, London: 1897, p. 117.

⁴⁰ University of California, *The University of California Chronicle*, University of California Press, January, 1917, p. 92.

⁴¹ R.L. Polk & Company, *Richmond and Contra Costa County Directory, 1914 – 1915*, Oakland, California: 1915.

⁴² Pacific Mining News, p.222.

⁴³ University of California, Berkeley, *Current Conditions Report*, Prepared by Tetra Tech EM Inc., November 21, 2008, p. 11.

⁴⁴ Marguerite Clausen, "On the Waterfront: An Oral History of Richmond, California", Regional Oral History Office, University of California, Berkeley, 1990, p. 21.

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B10. Significance (continued)

1940 the county was second only to Los Angeles in overall industrial production.⁴⁵ The nineteenth-century California Cap Company was dwarfed by the scale of some of the newer enterprises, and its physical plant and technology were aging. During World War II California Cap was able to stay open by producing delayed action incendiary bombs that were used against Japan.⁴⁶ The California Cap Company could not survive the transition to a peacetime economy, however, and by 1949 the plant was closed and the Oliver family looking for a buyer.

University Research/Richmond Field Station

After World War II UC Berkeley's Engineering Department needed an off-campus location in order to perform experiments that required more space than a laboratory. Department Chair Morrrough P. O' Brien and others in the department were performing experiments with sewage, sea water, and other materials unsuited to use on a crowded campus. They also wanted a location that was not too remote. The University purchased the California Cap Company from the Oliver family for the use of the Engineering Department in 1950.⁴⁷

The Richmond Field Station has been the location of a research overseen by numerous UC Berkeley departments over the years. The Sanitary Engineering Research Laboratory (SERL) was one of the first departments to undertake research at the site. SERL focused primarily on sewage treatment technology, and also researched pollution control and disposal of solid and liquid waste.⁴⁸ Other early projects at the field station included sea water distillation, heat transfer, and cyclic stress research.⁴⁹

At first the Department of Engineering utilized the buildings left behind by the California Cap Company. The Department established a machine shop, computer shop, receiving facility, mail service, and other facilities in addition to laboratories in the old detonator company buildings.⁵⁰ The current Buildings 102, 110, 118, 128, 150, 152 175, and 176 all date to the cap company era and have been repurposed for the Richmond Field Station. They also constructed new buildings as funds became available, and by the mid-1950s five new buildings had been completed at the Richmond Field Station.⁵¹ By the 1970s the department had conducted many experiments at the Richmond Field Station that could not have been performed on the main campus.

Building 102

Building 102 was constructed in the 1860s as a produce warehouse. The agricultural products of the Quilfelt-Stege and San Pablo ranches were stored here before being shipped to San Francisco via the adjacent wharf. During the California Cap Company era the building was used as a can factory and bomb production facility as well as a warehouse.

⁴⁵ Purcell, p. 649.

⁴⁶ Oliver, p. 1.

⁴⁷ P.H. McGauhey, "The Sanitary Engineering Research Laboratory: Administration, Research and Consultation, 1950-1975 – An Interview Conducted by Malca Call", Regional Oral History Office, University of California, Berkeley, 1974, p. 70.

⁴⁸ University of California, Berkeley, 2008, p. 13.

⁴⁹ University of California, Berkeley, Department of Engineering, "Richmond Field Station Open House", May 28, 1952, p. 3 – 4.

⁵⁰ McGauhey, p. 71.

⁵¹ University of California, Berkeley, Department of Engineering, "Guide for Engineering Field Station Inspection", undated, p. 3.

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After UC Berkeley took over the site activities at Building 102 included storage, a chemical laboratory, and office space. The building was also used for SERL research activities, which included the use of chemicals and radioisotopes during research activities.⁵²

Evaluation

Building 102 appears to meet the criteria for listing in the NHRP/CRHR because it is associated with events significant to national, state, and local history (Criterion A/1). It is the oldest building on the Richmond Field Station, dating to the property's ranching era. The manufacturing activities that took place in Building 102 were central to the production processes of the California Cap Company, the first blasting cap company in the United States. The company also manufactured bombs that were used against the Japanese during World War II in the building.

In addition, the building is associated with important individuals significant to our past (Criterion B/2). Building 102 is the oldest of the extant buildings at the Richmond Field Station, and therefore the most notably associated with California Cap Company founder William Letts Oliver. Oliver was a significant figure in the history of explosives manufacture, responsible for the invention of a high-heat explosive named Tonite as well as the first manufacturer of blasting caps in the United States. Building 102 is the only California Cap Company building specifically discussed in a document created in 1959 by William Letts Oliver's son Roland Oliver.⁵³

The building does not embody the distinctive characteristics of a type, period, region, or method of construction, or represent the work of an important creative individual or possess high artistic values (Criterion C/3). Building 102 is a utilitarian building that was constructed piecemeal over a period of many decades. Therefore the building is not eligible to the NHRP for its architecture.

In rare instances, buildings themselves can serve as sources of important information, however this building is not a principal source of important information in this regard (Criterion D/4).

Eligibility for listing on either the NRHP rests on significance and integrity. A property must have both factors to be considered eligible. Loss of integrity, if sufficiently great, would overwhelm the historical significance of a resource and render it ineligible. Despite Building 102's historical significance for the California Cap Company period, the building's integrity has suffered due to repeated alterations. Only its location has remained unchanged over the years, and its integrity of setting, design, materials, workmanship, feeling, and association have all been compromised. Therefore the building is not eligible for the NHRP or the CRHR. Although Building 102 has been found ineligible due to loss of integrity, because of its historical significance it may warrant special attention in the planning process.

⁵² University of California, Berkeley, 2008, p. 25.

⁵³ Oliver, p.1.

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Photographs:



Photograph 2: Building 102, circa 1954



Photograph 3: Building 102, circa 1970

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Photograph 4: Building 102, January 4, 2013, camera facing northwest



Photograph 5: Building 102, January 4, 2013, camera facing west

State of California – The Resources Agency
DEPARTMENT OF PARKS AND RECREATION
PRIMARY RECORD

Primary # _____
HRI # _____
Trinomial _____
NRHP Status Code _____

Other Listings _____
Review Code _____ Reviewer _____ Date _____

Page 1 of 9

*Resource Name or # (Assigned by recorder) Richmond Field Station Building 110

P1. Other Identifier: Richmond Field Station Building 110

***P2. Location:** Not for Publication Unrestricted

***a. County** Contra Costa

and (P2b and P2c or P2d. Attach a Location Map as necessary.)

***b. USGS 7.5' Quad** Richmond **Date** 1984 **T** _____; **R** _____; $\frac{1}{4}$ of **Sec** _____; Diablo **B.M.**

c. Address _____ City _____ Zip _____

d. UTM: (give more than one for large and/or linear resources) Zone 10; 558477 mE/ 4196309 mN

e. Other Locational Data: (e.g., parcel #, directions to resource, elevation, etc., as appropriate)

***P3a. Description:** (Describe resource and its major elements. Include design, materials, condition, alterations, size, setting, and boundaries)

Building 110 is near the southern edge of Richmond Field Station campus adjacent to Building 102. The vernacular building does not strongly express a particular architecture style. Constructed circa the 1910s, the building is 1,325 square feet, single story, with a rectangular plan and topped by a shallow pitch, front gabled roof. Its primary elevation faces southeast. Its moderate eaves feature exposed rafter tails on its northeast and southwest elevations. (See Continuation Sheet)

***P3b. Resource Attributes:** (List attributes and codes) HP15: Educational building, HP39: Other

***P4. Resources Present:** Building Structure Object Site District Element of District Other (Isolates, etc.)



P5b. Description of Photo: (View, date, accession #) Photograph 1: Southeast and northeast façades of building, camera facing west, January 4, 2013.

***P6. Date Constructed/Age and Sources:**
 Historic Prehistoric Both

Circa 1910

***P7. Owner and Address:**

U.C. Berkeley

1301 South 46th Street

Richmond, California 94804

***P8. Recorded by:** (Name, affiliation, address)

Kara Brunzell & Julia Mates

Tetra Tech

1999 Harrison Street, Ste 500

Oakland, CA 94612

***P9. Date Recorded:** January 4, 2013

***P10. Survey Type:** (Describe) Intensive

***P11. Report Citation:** (Cite survey report and other sources, or enter "none.") Historic

Properties Survey Report for Portions of the Richmond Field Station prepared by Tetra Tech, Inc. 2013.

***Attachments:** NONE Location Map Sketch Map Continuation Sheet Building, Structure, and Object Record Archaeological Record

District Record Linear Feature Record Milling Station Record Rock Art Record Artifact Record Photograph Record

Other (list) _____

*Resource Name or # (Assigned by recorder) Richmond Field Station Building 110

B1. Historic Name: California Cap Company Building 65

B2. Common Name: Building 110

B3. Original Use: Research Laboratory B4. Present Use: Vacant

*B5. Architectural Style: Vernacular

*B6. Construction History: (Construction date, alteration, and date of alterations) Constructed circa 1910

*B7. Moved? No Yes Unknown Date: circa 1960 Original Location: adjacent to Egret Way

*B8. Related Features: _____

B9. Architect: Unknown b. Builder: Unknown

*B10. Significance: Theme N/A Area N/A

Period of Significance N/A Property Type N/A Applicable Criteria N/A

(Discuss importance in terms of historical or architectural context as defined by theme, period, and geographic scope. Also address integrity.)

Building 110 at Richmond Field Station does not appear to meet the criteria for listing in the National Register of Historic Places (NRHP). Furthermore, the building has been evaluated in accordance with Section 15064.5(a)(2)-(3) of the CEQA Guidelines, using the criteria outlined in Section 5024.1 of the California Public Resources Code, and does not appear to meet the significance criteria as outlined in these guidelines. Therefore, the building is not eligible for listing in the California Register of Historical Resources (CRHR). (See Continuation Sheet)

B11. Additional Resource Attributes: (List attributes and codes)

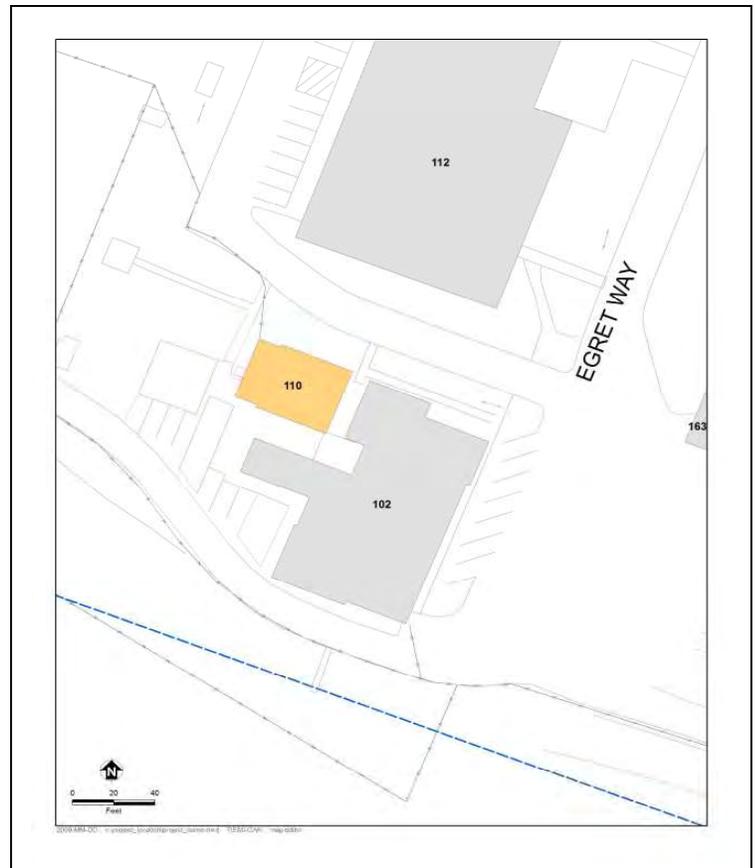
*B12. References: See Footnotes

B13. Remarks:

*B14. Evaluator: Kara Brunzell

*Date of Evaluation: January 2013

(This space reserved for official comments.)



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P3a. Description (continued)

The walls are clad in horizontal wood siding. Fenestration is original, multi-light, double-hung wood sashes. An original paneled wood entry door is centered in the southwest elevation. sheltered by a recessed entry porch and accessed by a set of wooden stairs. Plain entablature adorns the door and window surrounds throughout the otherwise unornamented building. An addition at the rear (northwest) of the building is topped by a shed roof. Its rear entrance is a wood paneled door with a window. This door is sheltered by a small awning and accessed by a set of wooden stairs. The building is surrounded by grassy areas, and access to the rear of the building is currently blocked by a wood fence to the south and a chain link fence to the north.

Building 110 was constructed by the California Cap Company circa the 1910s. The building was originally several hundred yards to the northeast of its current location, along Egret Way.¹ It was used as a research laboratory by the California Cap Company and labeled Building 65.²

After UC Berkeley's SERL took over the site in 1950 its activities were concentrated in the southeast section of the Richmond Field Station. Historic aerial photographs show that Building 110 was moved to its current location adjacent to Building 102 circa 1960 and was used for research using radioisotopes.³ After it was moved, Building 110 housed laboratories and offices for SERL's successor, (EEHSL).⁴ The building continued to be used for offices until 2008, but it is currently vacant.⁵

B10. Significance (continued)

Historic Context

Europeans arrived in what would become Contra Costa County in 1772, when a Spanish expedition led by Pedro Fages discovered the San Pablo Bay and the confluence of the Sacramento and San Joaquin rivers.⁶ Though subsequent Spanish expeditions passed through the region the Spanish do not appear to have settled in the area during the mission period. In the 1820s and 1830s the Mexican government began granting large tracts of land in the area to its citizens, including Ranchos San Pablo, San Ramon, and Pinole. The first permanent non-native settlers were Francisco Castro and his wife Maria Gabriela Berryessa. The Mexican government granted the 18,000 acre Rancho San Pablo to the Castros in 1823.⁷ Americans began farming in Contra Costa County in the late 1830s, and by 1882 2/3 of the cultivated land in the county was devoted to wheat production.⁸

¹ University of California, Berkley, "Draft Environmental Impact Report, Proposed U.S. Environmental Protection Agency, Region IX Laboratory at the University of California's Richmond Field Station," Prepared by University of California, Berkeley Planning, Design and Construction Department, July 1991, p. 307.

² University of California, Berkeley, 2008, p.

³ P.H. McGauhey, "The Sanitary Engineering Research Laboratory: Administration, Research and Consultation, 1950-1975 – An Interview Conducted by Malca Call," Regional Oral History Office, University of California, Berkeley, 1974, p. 71.

⁴ Shackelton, 2013.

⁵ University of California, Berkeley, 2008, p. 196.

⁶ Mildred B. Hoover, Hero E. Rensch, Ethel G. Rensch, Douglas E. Kyle, *Historic Spots in California, Fourth Edition*, Stanford University Press, Stanford, California: 1958, p. 129.

⁷ Donald Bastin, *Images of America: Richmond*, Arcadia Publishing, Charleston SC: 2003, p. 9.

⁸ J.P. Munro-Fraser, *History of Contra Costa County, California*, W.A. Slocum & Co., San Francisco: 1882, p. 55 – 57.

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B10. Significance (continued)

Minna C. C. Quilfelt (or Quilfeldt) purchased 600 acres of Rancho San Pablo in 1852 and 1853.⁹ Adjacent to San Francisco Bay in what would eventually become the southern portion of the City of Richmond, a wharf and produce warehouse were constructed on the ranch in the 1860s to ship agricultural produce to the San Francisco markets from Rancho San Pablo as well as the Quilfelt ranch. The warehouse and wharf were used to transport cattle, grain, fruit, and in later years the frogs' legs raised by Richard Stege for the San Francisco restaurant market.¹⁰ German native Richard Stege settled on Rancho San Pablo in the late 1860s after stints in the gold fields and the Siberian fur trade. He married Minna Quilfelt, who was a widow, in 1870.¹¹ Minna Quilfelt Stege died in 1879, leaving the ranch to Stege and her daughter Edith. Stege began selling off portions of his ranch to raise money while continuing his frog-raising and other ventures. A town named Stege formed on Richard Stege's holdings, and by the late nineteenth century several industries, including the California Cap Works, the United States Briquette Company, the Stauffer Chemical Works and the Stege Lumber Manufacturing Company, were operating from portions of the Stege Ranch.¹² Richmond incorporated in 1905, and by 1917 was already the largest city in Contra Costa County.¹³ Stege was eventually absorbed into Richmond as the latter grew.

The Explosives Industry in Contra Costa County

Swedish chemist Alfred Nobel laid the foundation for the high-explosives industry with his innovations beginning in 1860s, inventing first a detonator and then a blasting cap. In 1867 he invented dynamite, which was safer, cheaper, and more powerful than nitroglycerine, which had been the most commonly used explosive. Nobel licensed the Giant Powder Company to produce dynamite in California later that year. Giant was the first American company to produce dynamite, and its plant was initially located in Rock House Canyon, in what is today the City of San Francisco. The California Powder Works began manufacturing dynamite in the same area in 1869.¹⁴

The nineteenth century explosives industry was extremely dangerous, and as San Francisco's population grew explosives manufacturers needed to relocate. Contra Costa County across the bay was attractive since it was accessible due to its proximity to the harbor yet remote from population centers. In addition, the narrow canyons of Contra Costa County, which terminate in small bays, provided a natural geographical defense against explosions by allowing factory design that placed water between different facets of explosives manufacturing.¹⁵

During the 1870s chemical and explosives manufacturers began opening in the vicinity of what would eventually become Richmond. The Tonite Powder Company, Western Mineral Company, and California Cap Company were established at 1877 on the Stege ranch. The San Francisco explosives companies soon followed those explosive companies across the bay to Contra Costa County. In 1880, Giant relocated to Point Pinole, changing its name to

⁹ Evan Griffins, "Early History of Richmond", December 1938, El Cerrito Historical Society, website: <http://www.elcerritowire.com/history/pages/EarlyRichmond.htm>, accessed January 2013.

¹⁰ Roland Oliver, "Recollections of Early Industries in Stege", August 7, 1959, p. 1.

¹¹ J.P. Munro-Fraser, p. 675.

¹² Frederick J. Hulaniski, *The History of Contra Costa County, California*. Elms Publishing Company, Berkeley, California: 1917, p. 354.

¹³ Hulaniski p. 288.

¹⁴ Ida Mae Purcell, *History of Contra Costa County*, The Gillick Press, Berkeley, California" 1940, p. 645 – 646.

¹⁵ James E. Vance, *Geography and Urban Evolution in the San Francisco Bay Area*, University of California, Berkeley: 1964, p. 27.

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B10. Significance (continued)

the Atlas Powder Company. The California Powder Works soon followed, building a new factory in Hercules, which was named for the brand under which the company sold its powder.¹⁶ The Vulcan Powder Works and Judson Powder works also opened in the Stege Ranch area during this era, consolidating Contra Costa County's position as the cradle of the California explosives industry. The East Bay dominated California explosives manufacturing into the twentieth century. In 1902 California had only one powder factory outside Contra Costa and Alameda counties.¹⁷

William Letts Oliver

William Letts Oliver was born in Chile to English parents in 1844. He attended the University of Edinburgh and became a mining engineer. After returning to Chile, Oliver ran an explosives factory, which was nationalized by the Chilean government in 1864. After the loss of his factory, Oliver left Chile for San Francisco.¹⁸ William Letts Oliver and his wife Carrie lived in Oakland, from about 1880 until Oliver's death in 1918.¹⁹ The couple eventually had six children together: Roland, Edwin, Caroline, Anita, William Harold, and Albert.²⁰ In addition his various professional activities William Letts Oliver was a yachtsman and an officer of the Bohemian Grove club in the early twentieth century. An avid amateur photographer throughout his lifetime, UC Berkeley's Bancroft Library has a collection of 2700 negatives and prints taken by Oliver and his son.²¹

William Letts Oliver initially gained familiarity with an explosive called guncotton while manufacturing collodion for his photography hobby.²² As early as 1870, European explosive companies were experimenting with nitrated guncotton in and by 1875 it was manufactured in England under the name "tonite."²³ By 1877 Oliver had left Chile and was mining in the western United States. Engineers working on the Sutro Tunnel in the Comstock needed an explosive that would remain stable at the high temperatures underground to complete the tunnel, and Oliver was able to solve the problem by substituting tonite for more volatile compounds.²⁴

The California Cap Company

In 1877 William Letts Oliver was inspired by his success with tonite to leave mining and establish the Tonite Powder Company, on a portion of the former Stege Ranch.²⁵ In the 1870s all blasting caps in the United States

¹⁶ Purcell, p. 646.

¹⁷ Richmond Record, "Contra Costa County: Under the Vitascope", Richmond:1902.

¹⁸ Pacific Mining News, Supplement to Engineering & Mining Journal-Press, "Industrial Notes: Developing of the Blasting Cap Industry", Vol. 1, No. 7, November 1922, p. 222.

¹⁹ United States Census Bureau, Tenth Census of the United States, 1880, National Archives and Records Administration, Washington, D.C., San Francisco, California, Roll: 79, Film: 1254079, Page: 170B.

²⁰ United States Census Bureau, Twelfth Census of the United States, 1900, National Archives and Records Administration, Washington, D.C., Oakland Ward 3, Alameda, California, Roll: 82, Page: 13A.

²¹ Online Archive of California, "Guide to the Oliver Family Photograph Collection", UC Berkeley: 2009, website: <http://www.oac.cdlib.org/findaid/ark:/13030/ft0q2n99r1/> accessed February, 2013.

²² Pacific Mining News, p. 222.

²³ G.A. Price Cuxson, ed., "Society of Engineers: Transactions for 1889", E. & F. N. Spon, London: 1890, p. 95.

²⁴ Pacific Mining News, p. 222.

²⁵ Oliver, p. 1.

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B10. Significance (continued)

had to be imported from Europe. Not only were they expensive, but the timing of deliveries was uncertain, creating business difficulties for the powder plant. Oliver was determined to create his own caps in order to

protect the tonite factory business. He experimented until he came up with a blasting cap that was safer to use and had better detonating qualities than imported detonators. Oliver and his partner Freeborn Fletter founded the California Cap Company. It was located adjacent to the Tonite Powder Company a 160 acre parcel carved out of the southern portion of Stege Ranch.²⁶ California Cap Company, which went on to operate on the site for nearly seven decades, was the first manufacturer of blasting caps in the United States. Richard Stege, meanwhile, continued to reside on the ranch, and contracted with Tonite Powder and California Cap to transport their products to the railroad.²⁷ The California Cap Company was located on the parcel that is currently the Richmond Field Station. The Tonite Powder Company appears to have been located to the east on the parcel that became the Stauffer Chemical Company and later the Zeneca site, although its exact location is unclear.

The Tonite and California Cap factories, which were the first of several gunpowder and chemical companies in the region, were separated by the Stege agricultural warehouse for safety.²⁸ The explosives industry during this era was an extremely dangerous one. A horrific explosion in 1882 at the nearby Vulcan Powder Company caused 11 deaths and destroyed the plant.²⁹ Between 1882 and 1918 the Hercules and Atlas plants suffered numerous explosions which destroyed plant buildings and killed a total of 64 workers.³⁰ Despite its focus on safety, the California Cap Company had accidents as well. Two of its Chinese workers were killed in 1917 when one of them dropped a tray of caps. In 1941 an explosion caused a fire and critically injured a worker.³¹

William Letts Oliver continued to innovate throughout his long career in the chemical and explosives industries. In 1888 he formed the American Lucol Company adjacent to the California Cap Company property.³² The Lucol plant was at what is currently the southeastern corner of the Richmond Field Station, at the approximate location of Building 163. Lucol manufactured a linseed oil substitute.³³ The factory was dismantled and relocated to New Jersey circa 1900.³⁴ In 1903 the Hotaling Briquette Works opened on Lucol's site at the southeast corner of the current Richmond Field station property.³⁵ Later known as the U.S. Briquette Company, the plant appears to have operated at this location until at least 1917.³⁶ The U.S. Briquette Company buildings were demolished sometime in the 1960s.

²⁶ Pacific Mining News, p. 222.

²⁷ Nilda Rego, "Enterprising Stege lost all and died without a penny", Time Out, March 27, 1994, p. 2, column 4.

²⁸ Oliver, p. 1.

²⁹ Munro-Fraser, p. 424.

³⁰ Purcell, p. 648.

³¹ Contra Costa County Standard, "Stege Powder Plant Blast; One Near Death", June 6, 1941, p. 1A.

³² Oliver, p. 1.

³³ Max Wilhelm Von Bernewitz, *Cyanide Practice, 1910 – 1913*, Dewey Publishing Company: 1913, p. 327.

³⁴ Oliver, p. 1.

³⁵ Oliver, p. 2.

³⁶ Hulanski, p. 354.

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B10. Significance (continued)

The Oliver family aggressively promoted their products both through advertising and publishing. The California Cap Company sponsored or published both articles and book-length treatises on the use of explosives. Safety was a key element of the company image, a topic of company-sponsored technical writing as well as a selling point in advertisements.³⁷ The Tonite Powder Company's product was known even outside the United States, and by the end of the nineteenth century the powder's explosive properties were considered comparable to the finest English products.³⁸ Oliver's sons Roland and Edwin Letts Oliver both graduated from UC Berkeley's College of Mining in 1900. Roland Oliver seems to have spent his entire career working in the family enterprises, while Edwin worked at California Cap between mining and other ventures. The Oliver family also became benefactors of the university, and in 1917 the California Cap Company donated substantial amounts of their products to the College of Mining including 500 electric detonators, 500 delayed action exploders, and 500 blasting caps.³⁹

Eventually the Tonite factory appears to have been incorporated into the California Cap Company. The Olivers also formed an entity named Pacific Cartridge Company circa 1910. The Pacific Cartridge Company operated from the California Cap plant during World War I.⁴⁰ By 1916 there were at least a dozen buildings on the site. When Oliver died in 1918 his son Roland Oliver took over as president of California Cap Company. By 1922 Roland's brother Leslie Oliver was assistant manager of the plant and Edwin Letts Oliver was a director.⁴¹ Roland Oliver substantially expanded the California Cap Company after he took over as president. During this era the plant grew to include 150 buildings and a horse-drawn tram line.⁴²

During the late nineteenth and early twentieth century the California Cap Company was one of the most important local employers.⁴³ As the twentieth century progressed more heavy industry came to Contra Costa County, and by 1940 the county was second only to Los Angeles in overall industrial production.⁴⁴ The nineteenth-century California Cap Company was dwarfed by the scale of some of the newer enterprises, and its physical plant and technology were aging. During World War II California Cap was able to stay open by producing delayed action incendiary bombs that were used against Japan.⁴⁵ The California Cap Company could not survive the transition to a peacetime economy, however, and by 1949 the plant was closed and the Oliver family looking for a buyer.

University Research/Richmond Field Station

After World War II UC Berkeley's Engineering Department needed an off-campus location in order to perform experiments that required more space than a laboratory. Department Chair Morrrough P. O' Brien and others in the department were performing experiments with sewage, sea water, and other materials unsuited to use on a

³⁷ Halbert Powers Gillette, *Rock Excavation: Methods and Cost*, M.C. Clark, New York: 1904, x.

³⁸ Manual Eissler, *A Handbook on Modern Explosives*, Crosby, Lockwood & son, London: 1897, p. 117.

³⁹ University of California, *The University of California Chronicle*, University of California Press, January, 1917, p. 92.

⁴⁰ R.L. Polk & Company, *Richmond and Contra Costa County Directory, 1914 – 1915*, Oakland, California: 1915.

⁴¹ Pacific Mining News, p.222.

⁴² University of California, Berkeley, *Current Conditions Report*, Prepared by Tetra Tech EM Inc., November 21, 2008, p. 11.

⁴³ Marguerite Clausen, "On the Waterfront: An Oral History of Richmond, California", Regional Oral History Office, University of California, Berkeley, 1990, p. 21.

⁴⁴ Purcell, p. 649.

⁴⁵ Oliver, p. 1.

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B10. Significance (continued)

crowded campus. They also wanted a location that was not too remote. The University purchased the California Cap Company from the Oliver family for the use of the Engineering Department in 1950.⁴⁶

The Richmond Field Station has been the location of a research overseen by numerous UC Berkeley departments over the years. The Sanitary Engineering Research Laboratory (SERL) was one of the first departments to undertake research at the site. SERL focused primarily on sewage treatment technology, and also researched pollution control and disposal of solid and liquid waste.⁴⁷ Other early projects at the field station included sea water distillation, heat transfer, and cyclic stress research.⁴⁸

At first the Department of Engineering utilized the buildings left behind by the California Cap Company. The Department established a machine shop, computer shop, receiving facility, mail service, and other facilities in addition to laboratories in the old detonator company buildings.⁴⁹ The current Buildings 102, 110, 118, 128, 150, 152 175, and 176 all date to the cap company era and have been repurposed for the Richmond Field Station. They also constructed new buildings as funds became available, and by the mid-1950s five new buildings had been completed at the Richmond Field Station.⁵⁰ By the 1970s the department had conducted many experiments at the Richmond Field Station that could not have been performed on the main campus.

Building 110

Building 110 was constructed by the California Cap Company circa 1910. The building was originally located several hundred yards to the northeast of its current location, along Egret Way.⁵¹ It was used as a research laboratory by the California Cap Company and located adjacent to the plant's mercury fulminating area. It was labeled "Building 65".⁵²

After UC Berkeley's Sanitary Engineering Research Laboratory (SERL) took over the site in 1950 its activities were concentrated in the southeast section of the Richmond Field Station. In the early 1950s Building 110 housed algae symbiosis research.⁵³ Historic aerial photographs demonstrate that Building 110 was moved to its current location adjacent to Building 102 circa 1960. After it was moved Building 110 housed laboratories and offices for SERL's successor the Environmental Engineering and Health Sciences Laboratory (EEHSL).⁵⁴ The building continued to be used for offices until at least 2008, but it is currently vacant.⁵⁵

⁴⁶ P.H. McGauhey, "The Sanitary Engineering Research Laboratory: Administration, Research and Consultation, 1950-1975 – An Interview Conducted by Malca Call", Regional Oral History Office, University of California, Berkeley, 1974, p. 70.

⁴⁷ University of California, Berkeley, 2008, p. 13.

⁴⁸ University of California, Berkeley, Department of Engineering, "Richmond Field Station Open House", May 28, 1952, p. 3 – 4.

⁴⁹ McGauhey, p. 71.

⁵⁰ University of California, Berkeley, Department of Engineering, "Guide for Engineering Field Station Inspection", undated, p. 3.

⁵¹ University of California, Berkeley, "Draft Environmental Impact Report, Proposed U.S. Environmental Protection Agency, Region IX Laboratory at the University of California's Richmond Field Station", Prepared by University of California, Berkeley Planning, Design and Construction Department, July 1991, p. 307.

⁵² University of California, Berkeley, 2008, p.

⁵³ University of California, Berkeley, Department of Engineering, "Guide for Engineering Field Station Inspection", undated, p. 7.

⁵⁴ Shackelton, 2013.

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*Recorded by Tetra Tech *Date January 4, 2013 Continuation Update

Evaluation

The following provides an evaluation of Building 110 under each NRHP/CRHR criteria.

No particular association was found between the Building 110 and events significant to national, state, or local history (Criterion A/1). Although the California Cap Company was the first blasting cap manufacturer in the United States there is no indication that the research that took place in Building 110 was central to the development of the plant or its technical processes. Therefore the building is not eligible for inclusion in the NRHP for historical significance

Building 110 dates from the period when William Letts Oliver and his son Roland Oliver were making important breakthroughs in the explosives industry. However, no particular association has been found between the building and members of the Oliver family, or with other important individuals significant to our past (Criterion B/2). Therefore the building is not eligible under to the NRHP for association with important individuals.

The building does not embody the distinctive characteristics of a type, period, region, or method of construction, or represent the work of an important creative individual or possess high artistic values (Criterion C/3). Building 102 is a vernacular building of a type that was commonly constructed from the late nineteenth to the early twentieth century. Therefore the building is not eligible to the NHRP for its architecture.

In rare instances, buildings themselves can serve as sources of important information, however this building is not a principal source of important information in this regard (Criterion D/4).

⁵⁵ University of California, Berkeley, 2008, p. 196.

State of California – The Resources Agency
DEPARTMENT OF PARKS AND RECREATION
PRIMARY RECORD

Primary # _____
HRI # _____
Trinomial _____
NRHP Status Code _____

Other Listings _____
Review Code _____ Reviewer _____ Date _____

Page 1 of 8

*Resource Name or # (Assigned by recorder) Richmond Field Station Building 111

P1. Other Identifier: Richmond Field Station Building 111

***P2. Location:** Not for Publication Unrestricted *a. County Contra Costa

and (P2b and P2c or P2d. Attach a Location Map as necessary.)

***b. USGS 7.5' Quad** Richmond **Date** 1984 **T** _____; **R** _____; $\frac{1}{4}$ of **Sec** _____; Diablo **B.M.**

c. Address _____ City _____ Zip _____

d. UTM: (give more than one for large and/or linear resources) Zone 10; 558491 mE/ 4196401 mN

e. Other Locational Data: (e.g., parcel #, directions to resource, elevation, etc., as appropriate)

***P3a. Description:** (Describe resource and its major elements. Include design, materials, condition, alterations, size, setting, and boundaries)

Building 111 is in the southern portion of the Richmond Field Station. The utilitarian building does not express any particular architectural style. It is 507 square feet and was constructed in 1987. It is single story and rectangular in plan. The building is topped by a flat roof and constructed of concrete masonry units. It lacks fenestration, and its entrances are industrial-type metal doors on its northwest and southeast elevations.

***P3b. Resource Attributes:** (List attributes and codes) HP4: Ancillary Building

***P4. Resources Present:** Building Structure Object Site District Element of District Other (Isolates, etc.)



P5b. Description of Photo: (View, date, accession #) Photograph 1: Northwest and northeast facades of building, camera facing southeast, December 4, 2013.

***P6. Date Constructed/Age and Sources:**
 Historic Prehistoric Both
1987/UC Berkeley records

***P7. Owner and Address:**
U.C. Berkeley
1301 South 46th Street
Richmond, California 94804

***P8. Recorded by:** (Name, affiliation, address)
Kara Brunzell & Julia Mates
Tetra Tech
1999 Harrison Street, Ste 500
Oakland, CA 94612

***P9. Date Recorded:** January 4, 2013

***P10. Survey Type:** (Describe) Intensive

***P11. Report Citation:** (Cite survey report and other sources, or enter "none.") Historic Properties Survey Report for Portions of the Richmond Field Station prepared by Tetra Tech, Inc, 2013.

***Attachments:** NONE Location Map Sketch Map Continuation Sheet Building, Structure, and Object Record Archaeological Record
 District Record Linear Feature Record Milling Station Record Rock Art Record Artifact Record Photograph Record
 Other (list) _____

Page 2 of 8

*NRHP Status Code 6Z

*Resource Name or # (Assigned by recorder) Richmond Field Station Building 111

B1. Historic Name: _____

B2. Common Name: Building 111

B3. Original Use: Storage B4. Present Use: Storage

*B5. Architectural Style: Vernacular

*B6. Construction History: (Construction date, alteration, and date of alterations) Constructed in 1987

*B7. Moved? No Yes Unknown Date: _____ Original Location: _____

*B8. Related Features: _____

B9. Architect: Unknown b. Builder: Unknown

*B10. Significance: Theme N/A Area N/A

Period of Significance N/A Property Type N/A Applicable Criteria N/A

(Discuss importance in terms of historical or architectural context as defined by theme, period, and geographic scope. Also address integrity.)

Building 111 at Richmond Field Station does not appear to meet the criteria for listing in the National Register of Historic Places (NRHP). Furthermore, the building has been evaluated in accordance with Section 15064.5(a)(2)-(3) of the CEQA Guidelines, using the criteria outlined in Section 5024.1 of the California Public Resources Code, and does not appear to meet the significance criteria as outlined in these guidelines. Therefore, the building is not eligible for listing in the California Register of Historical Resources (CRHR). (See Continuation Sheet.)

B11. Additional Resource Attributes: (List attributes and codes)

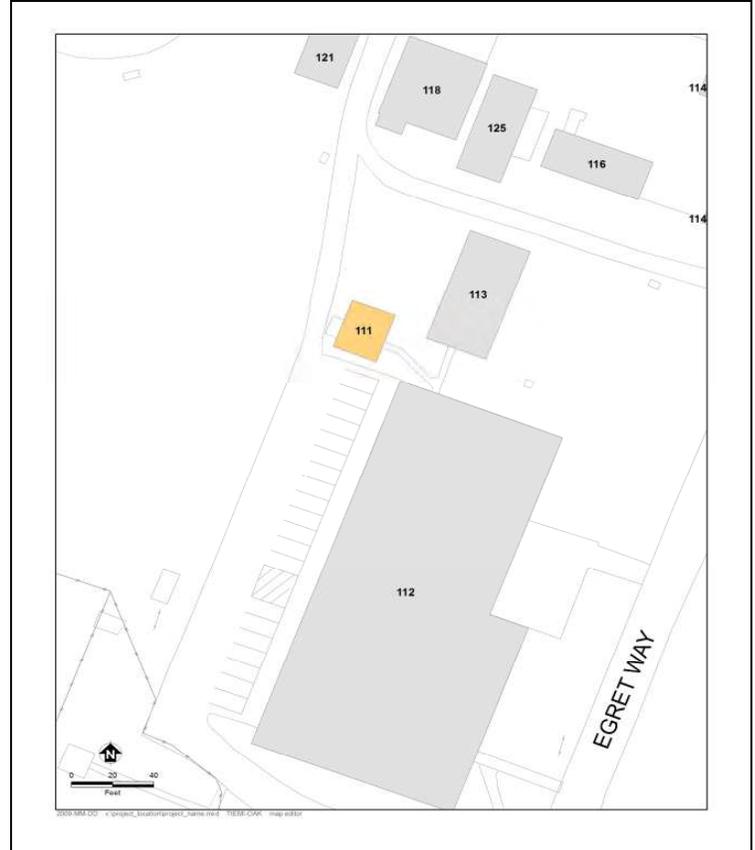
*B12. References: See Footnotes

B13. Remarks:

*B14. Evaluator: Kara Brunzell

*Date of Evaluation: January 2013

(This space reserved for official comments.)



Page 3 of 8 *Resource Name or # (Assigned by recorder) Richmond Field Station Building 111
*Recorded by Tetra Tech *Date January 4, 2013 Continuation Update

B10. Significance (continued)

Historic Context

Europeans arrived in what would become Contra Costa County in 1772, when a Spanish expedition led by Pedro Fages discovered the San Pablo Bay and the confluence of the Sacramento and San Joaquin rivers.¹ Though subsequent Spanish expeditions passed through the region the Spanish do not appear to have settled in the area during the mission period. In the 1820s and 1830s the Mexican government began granting large tracts of land in the area to its citizens, including Ranchos San Pablo, San Ramon, and Pinole. The first permanent non-native settlers were Francisco Castro and his wife Maria Gabriela Berryessa. The Mexican government granted the 18,000 acre Rancho San Pablo to the Castros in 1823.² Americans began farming in Contra Costa County in the late 1830s, and by 1882 2/3 of the cultivated land in the county was devoted to wheat production.³

Minna C. C. Quilfelt (or Quilfeldt) purchased 600 acres of Rancho San Pablo in 1852 and 1853.⁴ Adjacent to San Francisco Bay in what would eventually become the southern portion of the City of Richmond, a wharf and produce warehouse were constructed on the ranch in the 1860s to ship agricultural produce to the San Francisco markets from Rancho San Pablo as well as the Quilfelt ranch. The warehouse and wharf were used to transport cattle, grain, fruit, and in later years the frogs' legs raised by Richard Stege for the San Francisco restaurant market.⁵ German native Richard Stege settled on Rancho San Pablo in the late 1860s after stints in the gold fields and the Siberian fur trade. He married Minna Quilfelt, who was a widow, in 1870.⁶ Minna Quilfelt Stege died in 1879, leaving the ranch to Stege and her daughter Edith. Stege began selling off portions of his ranch to raise money while continuing his frog-raising and other ventures. A town named Stege formed on Richard Stege's holdings, and by the late nineteenth century several industries, including the California Cap Works, the United States Briquette Company, the Stauffer Chemical Works and the Stege Lumber Manufacturing Company, were operating from portions of the Stege Ranch.⁷ Richmond incorporated in 1905, and by 1917 was already the largest city in Contra Costa County.⁸ Stege was eventually absorbed into Richmond as the latter grew.

The Explosives Industry in Contra Costa County

Swedish chemist Alfred Nobel laid the foundation for the high-explosives industry with his innovations beginning in 1860s, inventing first a detonator and then a blasting cap. In 1867 he invented dynamite, which was safer, cheaper, and more powerful than nitroglycerine, which had been the most commonly used explosive. Nobel licensed the Giant Powder Company to produce dynamite in California later that year. Giant was the first American company to produce dynamite, and its plant was initially located in Rock House Canyon, in what is

¹ Mildred B. Hoover, Hero E. Rensch, Ethel G. Rensch, Douglas E. Kyle, *Historic Spots in California, Fourth Edition*, Stanford University Press, Stanford, California: 1958, p. 129.

² Donald Bastin, *Images of America: Richmond*, Arcadia Publishing, Charleston SC: 2003, p. 9.

³ J.P. Munro-Fraser, *History of Contra Costa County, California*, W.A. Slocum & Co., San Francisco: 1882, p. 55 – 57.

⁴ Evan Griffins, "Early History of Richmond", December 1938, El Cerrito Historical Society, website: <http://www.elcerritowire.com/history/pages/EarlyRichmond.htm>, accessed January 2013.

⁵ Roland Oliver, "Recollections of Early Industries in Stege", August 7, 1959, p. 1.

⁶ J.P. Munro-Fraser, p. 675.

⁷ Frederick J. Hulaniski, *The History of Contra Costa County, California*. Elms Publishing Company, Berkeley, California: 1917, p. 354.

⁸ Hulaniski p. 288.

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*Recorded by Tetra Tech

*Date January 4, 2013 Continuation Update

B10. Significance (continued)

today the City of San Francisco. The California Powder Works began manufacturing dynamite in the same area in 1869.⁹

The nineteenth century explosives industry was extremely dangerous, and as San Francisco's population grew explosives manufacturers needed to relocate. Contra Costa County across the bay was attractive since it was accessible due to its proximity to the harbor yet remote from population centers. In addition, the narrow canyons of Contra Costa County, which terminate in small bays, provided a natural geographical defense against explosions by allowing factory design that placed water between different facets of explosives manufacturing.¹⁰

During the 1870s chemical and explosives manufacturers began opening in the vicinity of what would eventually become Richmond. The Tonite Powder Company, Western Mineral Company, and California Cap Company were established at 1877 on the Stege ranch. The San Francisco explosives companies soon followed those explosive companies across the bay to Contra Costa County. In 1880, Giant relocated to Point Pinole, changing its name to the Atlas Powder Company. The California Powder Works soon followed, building a new factory in Hercules, which was named for the brand under which the company sold its powder.¹¹ The Vulcan Powder Works and Judson Powder works also opened in the Stege Ranch area during this era, consolidating Contra Costa County's position as the cradle of the California explosives industry. The East Bay dominated California explosives manufacturing into the twentieth century. In 1902 California had only one powder factory outside Contra Costa and Alameda counties.¹²

William Letts Oliver

William Letts Oliver was born in Chile to English parents in 1844. He attended the University of Edinburgh and became a mining engineer. After returning to Chile, Oliver ran an explosives factory, which was nationalized by the Chilean government in 1864. After the loss of his factory, Oliver left Chile for San Francisco.¹³ William Letts Oliver and his wife Carrie lived in Oakland, from about 1880 until Oliver's death in 1918.¹⁴ The couple eventually had six children together: Roland, Edwin, Caroline, Anita, William Harold, and Albert.¹⁵ In addition his various professional activities William Letts Oliver was a yachtsman and an officer of the Bohemian Grove club in the early twentieth century. An avid amateur photographer throughout his lifetime, UC Berkeley's Bancroft Library has a collection of 2700 negatives and prints taken by Oliver and his son.¹⁶

⁹ Ida Mae Purcell, *History of Contra Costa County*, The Gillick Press, Berkeley, California" 1940, p. 645 – 646.

¹⁰ James E. Vance, *Geography and Urban Evolution in the San Francisco Bay Area*, University of California, Berkeley: 1964, p. 27.

¹¹ Purcell, p. 646.

¹² Richmond Record, "Contra Costa County: Under the Vitascope", Richmond:1902.

¹³ Pacific Mining News, Supplement to Engineering & Mining Journal-Press, "Industrial Notes: Developing of the Blasting Cap Industry", Vol. 1, No. 7, November 1922, p. 222.

¹⁴ United States Census Bureau, Tenth Census of the United States, 1880, National Archives and Records Administration, Washington, D.C., San Francisco, California, Roll: 79, Film: 1254079, Page: 170B.

¹⁵ United States Census Bureau, Twelfth Census of the United States, 1900, National Archives and Records Administration, Washington, D.C., Oakland Ward 3, Alameda, California, Roll: 82, Page: 13A.

¹⁶ Online Archive of California, "Guide to the Oliver Family Photograph Collection", UC Berkeley: 2009, website: <http://www.oac.cdlib.org/findaid/ark:/13030/ft0q2n99r1/> accessed February, 2013.

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*Recorded by Tetra Tech

*Date January 4, 2013 Continuation Update

B10. Significance (continued)

William Letts Oliver initially gained familiarity with an explosive called guncotton while manufacturing collodion for his photography hobby.¹⁷ As early as 1870, European explosive companies were experimenting with nitrated guncotton in and by 1875 it was manufactured in England under the name “tonite.”¹⁸ By 1877 Oliver had left Chile and was mining in the western United States. Engineers working on the Sutro Tunnel in the Comstock needed an explosive that would remain stable at the high temperatures underground to complete the tunnel, and Oliver was able to solve the problem by substituting tonite for more volatile compounds.¹⁹

The California Cap Company

In 1877 William Letts Oliver was inspired by his success with tonite to leave mining and establish the Tonite Powder Company, on a portion of the former Stege Ranch.²⁰ In the 1870s all blasting caps in the United States had to be imported from Europe. Not only were they expensive, but the timing of deliveries was uncertain, creating business difficulties for the powder plant. Oliver was determined to create his own caps in order to protect the tonite factory business. He experimented until he came up with a blasting cap that was safer to use and had better detonating qualities than imported detonators. Oliver and his partner Freeborn Fletter founded the California Cap Company. It was located adjacent to the Tonite Powder Company a 160 acre parcel carved out of the southern portion of Stege Ranch.²¹ California Cap Company, which went on to operate on the site for nearly seven decades, was the first manufacturer of blasting caps in the United States. Richard Stege, meanwhile, continued to reside on the ranch, and contracted with Tonite Powder and California Cap to transport their products to the railroad.²² The California Cap Company was located on the parcel that is currently the Richmond Field Station. The Tonite Powder Company appears to have been located to the east on the parcel that became the Stauffer Chemical Company and later the Zeneca site, although its exact location is unclear.

The Tonite and California Cap factories, which were the first of several gunpowder and chemical companies in the region, were separated by the Stege agricultural warehouse for safety.²³ The explosives industry during this era was an extremely dangerous one. A horrific explosion in 1882 at the nearby Vulcan Powder Company caused 11 deaths and destroyed the plant.²⁴ Between 1882 and 1918 the Hercules and Atlas plants suffered numerous explosions which destroyed plant buildings and killed a total of 64 workers.²⁵ Despite its focus on safety, the California Cap Company had accidents as well. Two of its Chinese workers were killed in 1917 when one of them dropped a tray of caps. In 1941 an explosion caused a fire and critically injured a worker.²⁶

¹⁷ Pacific Mining News, p. 222.

¹⁸ G.A. Price Cuxson, ed., “Society of Engineers: Transactions for 1889”, E. & F. N. Spon, London: 1890, p. 95.

¹⁹ Pacific Mining News, p. 222.

²⁰ Oliver, p. 1.

²¹ Pacific Mining News, p. 222.

²² Nilda Rego, “Enterprising Stege lost all and died without a penny”, Time Out, March 27, 1994, p. 2, column 4.

²³ Oliver, p. 1.

²⁴ Munro-Fraser, p. 424.

²⁵ Purcell, p. 648.

²⁶ Contra Costa County Standard, “Stege Powder Plant Blast; One Near Death”, June 6, 1941, p. 1A.

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*Recorded by Tetra Tech

*Date January 4, 2013 Continuation Update

B10. Significance (continued)

William Letts Oliver continued to innovate throughout his long career in the chemical and explosives industries. In 1888 he formed the American Lucol Company adjacent to the California Cap Company property.²⁷ The Lucol plant was at what is currently the southeastern corner of the Richmond Field Station, at the approximate location of Building 163. Lucol manufactured a linseed oil substitute.²⁸ The factory was dismantled and relocated to New Jersey circa 1900.²⁹ In 1903 the Hotaling Briquette Works opened on Lucol's site at the southeast corner of the current Richmond Field station property.³⁰ Later known as the U.S. Briquette Company, the plant appears to have operated at this location until at least 1917.³¹ The U.S. Briquette Company buildings were demolished sometime in the 1960s.

The Oliver family aggressively promoted their products both through advertising and publishing. The California Cap Company sponsored or published both articles and book-length treatises on the use of explosives. Safety was a key element of the company image, a topic of company-sponsored technical writing as well as a selling point in advertisements.³² The Tonite Powder Company's product was known even outside the United States, and by the end of the nineteenth century the powder's explosive properties were considered comparable to the finest English products.³³ Oliver's sons Roland and Edwin Letts Oliver both graduated from UC Berkeley's College of Mining in 1900. Roland Oliver seems to have spent his entire career working in the family enterprises, while Edwin worked at California Cap between mining and other ventures. The Oliver family also became benefactors of the university, and in 1917 the California Cap Company donated substantial amounts of their products to the College of Mining including 500 electric detonators, 500 delayed action exploders, and 500 blasting caps.³⁴

Eventually the Tonite factory appears to have been incorporated into the California Cap Company. The Olivers also formed an entity named Pacific Cartridge Company circa 1910. The Pacific Cartridge Company operated from the California Cap plant during World War I.³⁵ By 1916 there were at least a dozen buildings on the site. When Oliver died in 1918 his son Roland Oliver took over as president of California Cap Company. By 1922 Roland's brother Leslie Oliver was assistant manager of the plant and Edwin Letts Oliver was a director.³⁶ Roland Oliver substantially expanded the California Cap Company after he took over as president. During this era the plant grew to include 150 buildings and a horse-drawn tram line.³⁷

²⁷ Oliver, p. 1.

²⁸ Max Wilhelm Von Bernewitz, *Cyanide Practice, 1910 – 1913*, Dewey Publishing Company: 1913, p. 327.

²⁹ Oliver, p. 1.

³⁰ Oliver, p. 2.

³¹ Hulanksi, p. 354.

³² Halbert Powers Gillette, *Rock Excavation: Methods and Cost*, M.C. Clark, New York: 1904, x.

³³ Manual Eissler, *A Handbook on Modern Explosives*, Crosby, Lockwood & son, London: 1897, p. 117.

³⁴ University of California, *The University of California Chronicle*, University of California Press, January, 1917, p. 92.

³⁵ R.L. Polk & Company, *Richmond and Contra Costa County Directory, 1914 – 1915*, Oakland, California: 1915.

³⁶ Pacific Mining News, p.222.

³⁷ University of California, Berkeley, *Current Conditions Report*, Prepared by Tetra Tech EM Inc., November 21, 2008, p. 11.

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*Recorded by Tetra Tech

*Date January 4, 2013 Continuation Update

B10. Significance (continued)

During the late nineteenth and early twentieth century the California Cap Company was one of the most important local employers.³⁸ As the twentieth century progressed more heavy industry came to Contra Costa County, and by 1940 the county was second only to Los Angeles in overall industrial production.³⁹ The nineteenth-century California Cap Company was dwarfed by the scale of some of the newer enterprises, and its physical plant and technology were aging. During World War II California Cap was able to stay open by producing delayed action incendiary bombs that were used against Japan.⁴⁰ The California Cap Company could not survive the transition to a peacetime economy, however, and by 1949 the plant was closed and the Oliver family looking for a buyer.

University Research/Richmond Field Station

After World War II UC Berkeley's Engineering Department needed an off-campus location in order to perform experiments that required more space than a laboratory. Department Chair Morrrough P. O' Brien and others in the department were performing experiments with sewage, sea water, and other materials unsuited to use on a crowded campus. They also wanted a location that was not too remote. The University purchased the California Cap Company from the Oliver family for the use of the Engineering Department in 1950.⁴¹

The Richmond Field Station has been the location of a research overseen by numerous UC Berkeley departments over the years. The Sanitary Engineering Research Laboratory (SERL) was one of the first departments to undertake research at the site. SERL focused primarily on sewage treatment technology, and also researched pollution control and disposal of solid and liquid waste.⁴² Other early projects at the field station included sea water distillation, heat transfer, and cyclic stress research.⁴³

At first the Department of Engineering utilized the buildings left behind by the California Cap Company. The Department established a machine shop, computer shop, receiving facility, mail service, and other facilities in addition to laboratories in the old detonator company buildings.⁴⁴ The current Buildings 102, 110, 118, 128, 150, 152 175, and 176 all date to the cap company era and have been repurposed for the Richmond Field Station. They also constructed new buildings as funds became available, and by the mid-1950s five new buildings had been completed at the Richmond Field Station.⁴⁵ By the 1970s the department had conducted many experiments at the Richmond Field Station that could not have been performed on the main campus.

Building 111

³⁸ Marguerite Clausen, "On the Waterfront: An Oral History of Richmond, California", Regional Oral History Office, University of California, Berkeley, 1990, p. 21.

³⁹ Purcell, p. 649.

⁴⁰ Oliver, p. 1.

⁴¹ P.H. McGauhey, "The Sanitary Engineering Research Laboratory: Administration, Research and Consultation, 1950-1975 – An Interview Conducted by Malca Call", Regional Oral History Office, University of California, Berkeley, 1974, p. 70.

⁴² University of California, Berkeley, 2008, p. 13.

⁴³ University of California, Berkeley, Department of Engineering, "Richmond Field Station Open House", May 28, 1952, p. 3 – 4.

⁴⁴ McGauhey, p. 71.

⁴⁵ University of California, Berkeley, Department of Engineering, "Guide for Engineering Field Station Inspection", undated, p. 3.

Page 8 of 8 *Resource Name or # (Assigned by recorder) Richmond Field Station Building 111

*Recorded by Tetra Tech

*Date January 4, 2013 Continuation Update

Building 111 appears to have been constructed by UC Berkeley in 1987 on the site of an older building.⁴⁶ The site seems to have housed a storage shed, California Cap Company “Building 148”, prior to the construction of Building 111. It was constructed for hazardous materials storage.⁴⁷ The Watershed Project, a non-profit group whose offices are at the Richmond Field Station, has used the building for storage for the past several years.⁴⁸ The building is not of a historic age, as it was constructed 26 years ago.

Evaluation

The following provides an evaluation of Building 111 under each NRHP/CRHR criteria.

Building 111 does not appear to meet the criteria for listing in National Register of Historic Places because it lacks historical significance. The structure has served as a storage facility throughout its lifetime and lacks the strength of association necessary to be considered historically significant in relation to any particular events or persons (Criteria A/1 and B/2).

The utilitarian building lacks any identifiable architectural stylistic design and does not embody distinctive architectural or engineering qualities of type, period, or method of construction (Criterion C/3). In rare instances, buildings themselves can serve as sources of important information, however this building is not a principal source of important information in this regard (Criterion D/4).

As a storage facility Building 111 does not meet the standard of exceptional importance required for properties under 50 years old to be eligible to the NHRP (Criterion G).

⁴⁶ University of California, Berkeley, 2008, p. 196.

⁴⁷ University of California, Berkeley, 2008, p. 13.

⁴⁸ Scott Shackleton, University of California, Berkeley, Personal communication with Julia Mates, Tetra Tech, 2013.

State of California – The Resources Agency
DEPARTMENT OF PARKS AND RECREATION
PRIMARY RECORD

Primary # _____
HRI # _____
Trinomial _____
NRHP Status Code _____

Other Listings _____
Review Code _____ Reviewer _____ Date _____

Page 1 of 8

*Resource Name or # (Assigned by recorder) Richmond Field Station Building 112

P1. Other Identifier: Richmond Field Station Building 112

*P2. Location: Not for Publication Unrestricted

*a. County Contra Costa

and (P2b and P2c or P2d. Attach a Location Map as necessary.)

*b. USGS 7.5' Quad Richmond Date 1984 T _____; R _____; ¼ of Sec _____; Diablo B.M.

c. Address _____ City _____ Zip _____

d. UTM: (give more than one for large and/or linear resources) Zone 10; 558500 mE/ 4196357 mN

e. Other Locational Data: (e.g., parcel #, directions to resource, elevation, etc., as appropriate)

*P3a. Description: (Describe resource and its major elements. Include design, materials, condition, alterations, size, setting, and boundaries)

Building 112 is in the southern portion of the Richmond Field Station. The rectangular, single-story, 16,949 square-foot building was constructed in 1964.

The building is topped with a flat roof. Its southeast (primary) and northwest (rear) elevations feature a broad eave overhang with large exposed roof rafters. The roof is supported by large plain columns. The walls are sided in stucco with wood trim. Primary fenestration is fixed and awning metal sashes, with vinyl replacement windows at the rear elevation. The primary entrance is a recessed glazed door with a transom and surround.

(See Continuation Sheet)

*P3b. Resource Attributes: (List attributes and codes) HP15: Educational building, HP39: Other

*P4. Resources Present: Building Structure
 Object Site District Element of District
Other (Isolates, etc.)

P5b. Description of Photo: (View, date, accession #) Photograph 1: Southwest and southeast facades of building, camera facing north, January 4, 2013.

*P6. Date Constructed/Age and Sources:

Historic Prehistoric Both

1964/UC Berkeley records

*P7. Owner and Address:

U.C. Berkeley

1301 South 46th Street

Richmond, California 94804

*P8. Recorded by: (Name, affiliation, address)

Kara Brunzell & Julia Mates

Tetra Tech

1999 Harrison Street, Ste 500

Oakland, CA 94612

*P9. Date Recorded: January 4, 2013

*P10. Survey Type: (Describe) Intensive



*P11. Report Citation: (Cite survey report and other sources, or enter "none.") Historic Properties Survey Report for Portions of the Richmond Field Station prepared by Tetra Tech, Inc, 2013.

*Attachments: NONE Location Map Sketch Map Continuation Sheet Building, Structure, and Object Record Archaeological Record

District Record Linear Feature Record Milling Station Record Rock Art Record Artifact Record Photograph Record

Other (list) _____

Page 2 of 8

*NRHP Status Code 6Z

*Resource Name or # (Assigned by recorder) Richmond Field Station Building 112

B1. Historic Name: _____

B2. Common Name: Building 112

B3. Original Use: Office B4. Present Use: Office

*B5. Architectural Style: Vernacular

*B6. Construction History: (Construction date, alteration, and date of alterations) Constructed in 1964

*B7. Moved? No Yes Unknown Date: _____ Original Location: _____

*B8. Related Features: _____

B9. Architect: Unknown b. Builder: Unknown

*B10. Significance: Theme N/A Area N/A

Period of Significance N/A Property Type N/A Applicable Criteria N/A

(Discuss importance in terms of historical or architectural context as defined by theme, period, and geographic scope. Also address integrity.)

Building 112 at Richmond Field Station does not appear to meet the criteria for listing in the National Register of Historic Places (NRHP). Furthermore, the building has been evaluated in accordance with Section 15064.5(a)(2)-(3) of the CEQA Guidelines, using the criteria outlined in Section 5024.1 of the California Public Resources Code, and does not appear to meet the significance criteria as outlined in these guidelines. Therefore, the building is not eligible for listing in the California Register of Historical Resources (CRHR). (See Continuation Sheet.)

B11. Additional Resource Attributes: (List attributes and codes)

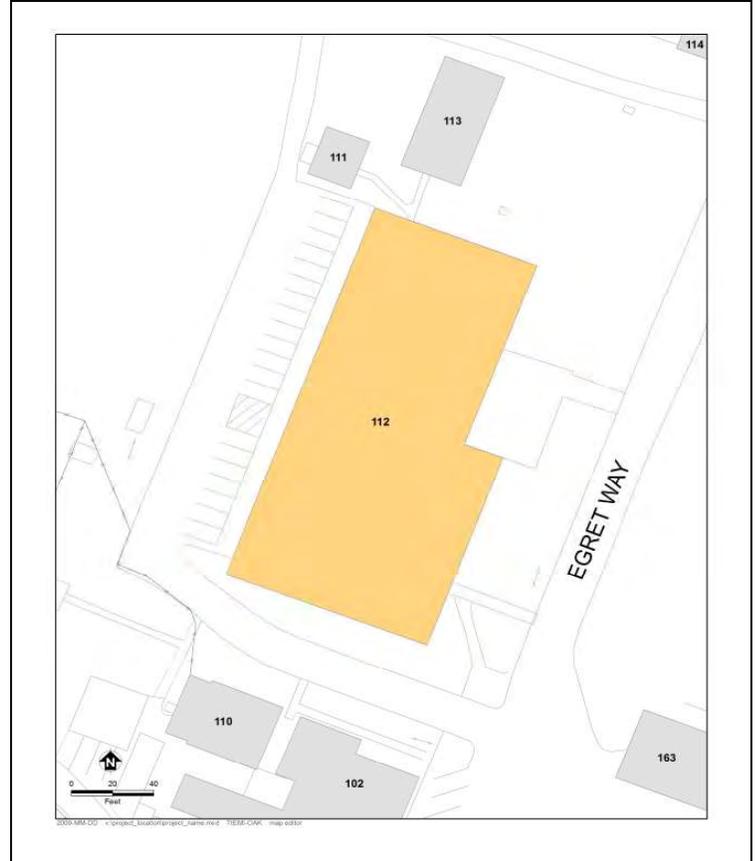
*B12. References: See Footnotes

B13. Remarks:

*B14. Evaluator: Kara Brunzell

*Date of Evaluation: January 2013

(This space reserved for official comments.)



Page 3 of 8 *Resource Name or # (Assigned by recorder) Richmond Field Station Building 112

*Recorded by Tetra Tech

*Date January 4, 2013 Continuation Update

P3a. Description (continued)

The building features landscaped areas in the front southeast side elevation that include mature trees along Egret Way. It is identified as the Center for Tissue Bioengineering. A small parking area is adjacent to its rear (northwest) elevation.

B10. Significance (continued)

Historic Context

Europeans arrived in what would become Contra Costa County in 1772, when a Spanish expedition led by Pedro Fages discovered the San Pablo Bay and the confluence of the Sacramento and San Joaquin rivers.¹ Though subsequent Spanish expeditions passed through the region the Spanish do not appear to have settled in the area during the mission period. In the 1820s and 1830s the Mexican government began granting large tracts of land in the area to its citizens, including Ranchos San Pablo, San Ramon, and Pinole. The first permanent non-native settlers were Francisco Castro and his wife Maria Gabriela Berryessa. The Mexican government granted the 18,000 acre Rancho San Pablo to the Castros in 1823.² Americans began farming in Contra Costa County in the late 1830s, and by 1882 2/3 of the cultivated land in the county was devoted to wheat production.³

Minna C. C. Quilfelt (or Quilfeldt) purchased 600 acres of Rancho San Pablo in 1852 and 1853.⁴ Adjacent to San Francisco Bay in what would eventually become the southern portion of the City of Richmond, a wharf and produce warehouse were constructed on the ranch in the 1860s to ship agricultural produce to the San Francisco markets from Rancho San Pablo as well as the Quilfelt ranch. The warehouse and wharf were used to transport cattle, grain, fruit, and in later years the frogs' legs raised by Richard Stege for the San Francisco restaurant market.⁵ German native Richard Stege settled on Rancho San Pablo in the late 1860s after stints in the gold fields and the Siberian fur trade. He married Minna Quilfelt, who was a widow, in 1870.⁶ Minna Quilfelt Stege died in 1879, leaving the ranch to Stege and her daughter Edith. Stege began selling off portions of his ranch to raise money while continuing his frog-raising and other ventures. A town named Stege formed on Richard Stege's holdings, and by the late nineteenth century several industries, including the California Cap Works, the United States Briquette Company, the Stauffer Chemical Works and the Stege Lumber Manufacturing Company, were operating from portions of the Stege Ranch.⁷ Richmond incorporated in 1905, and by 1917 was already the largest city in Contra Costa County.⁸ Stege was eventually absorbed into Richmond as the latter grew.

The Explosives Industry in Contra Costa County

Swedish chemist Alfred Nobel laid the foundation for the high-explosives industry with his innovations beginning in 1860s, inventing first a detonator and then a blasting cap. In 1867 he invented dynamite, which was safer,

¹ Mildred B. Hoover, Hero E. Rensch, Ethel G. Rensch, Douglas E. Kyle, *Historic Spots in California, Fourth Edition*, Stanford University Press, Stanford, California: 1958, p. 129.

² Donald Bastin, *Images of America: Richmond*, Arcadia Publishing, Charleston SC: 2003, p. 9.

³ J.P. Munro-Fraser, *History of Contra Costa County, California*, W.A. Slocum & Co., San Francisco: 1882, p. 55 – 57.

⁴ Evan Griffins, "Early History of Richmond", December 1938, El Cerrito Historical Society, website: <http://www.elcerritowire.com/history/pages/EarlyRichmond.htm>, accessed January 2013.

⁵ Roland Oliver, "Recollections of Early Industries in Stege", August 7, 1959, p. 1.

⁶ J.P. Munro-Fraser, *History of Contra Costa County, California*, W.A. Slocum & Co., San Francisco: 1882, p. 675.

⁷ Frederick J. Hulaniski, *The History of Contra Costa County, California*. Elms Publishing Company, Berkeley, California: 1917, p. 354.

⁸ Hulaniski p. 288.

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cheaper, and more powerful than nitroglycerine, which had been the most commonly used explosive. Nobel licensed the Giant Powder Company to produce dynamite in California later that year. Giant was the first American company to produce dynamite, and its plant was initially located in Rock House Canyon, in what is today the City of San Francisco. The California Powder Works began manufacturing dynamite in the same area in 1869.⁹

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During the 1870s chemical and explosives manufacturers began opening in the vicinity of what would eventually become Richmond. The Tonite Powder Company, Western Mineral Company, and California Cap Company were established at 1877 on the Stege ranch. The San Francisco explosives companies soon followed those explosive companies across the bay to Contra Costa County. In 1880, Giant relocated to Point Pinole, changing its name to the Atlas Powder Company. The California Powder Works soon followed, building a new factory in Hercules, which was named for the brand under which the company sold its powder.¹¹ The Vulcan Powder Works and Judson Powder works also opened in the Stege Ranch area during this era, consolidating Contra Costa County's position as the cradle of the California explosives industry. The East Bay dominated California explosives manufacturing into the twentieth century. In 1902 California had only one powder factory outside Contra Costa and Alameda counties.¹²

William Letts Oliver

William Letts Oliver was born in Chile to English parents in 1844. He attended the University of Edinburgh and became a mining engineer. After returning to Chile, Oliver ran an explosives factory, which was nationalized by the Chilean government in 1864. After the loss of his factory, Oliver left Chile for San Francisco.¹³ William Letts Oliver and his wife Carrie lived in Oakland, from about 1880 until Oliver's death in 1918.¹⁴ The couple eventually had six children together: Roland, Edwin, Caroline, Anita, William Harold, and Albert.¹⁵ In addition his various professional activities William Letts Oliver was a yachtsman and an officer of the Bohemian Grove club in the early twentieth century. An avid amateur photographer throughout his lifetime, UC Berkeley's Bancroft Library has a collection of 2700 negatives and prints taken by Oliver and his son.¹⁶

⁹ Ida Mae Purcell, *History of Contra Costa County*, The Gillick Press, Berkeley, California" 1940, p. 645 – 646.

¹⁰ James E. Vance, *Geography and Urban Evolution in the San Francisco Bay Area*, University of California, Berkeley: 1964, p. 27.

¹¹ Purcell, p. 646.

¹² Richmond Record, "Contra Costa County: Under the Vitascope", Richmond:1902.

¹³ Pacific Mining News, Supplement to Engineering & Mining Journal-Press, "Industrial Notes: Developing of the Blasting Cap Industry", Vol. 1, No. 7, November 1922, p. 222.

¹⁴ United States Census Bureau, Tenth Census of the United States, 1880, National Archives and Records Administration, Washington, D.C., San Francisco, California, Roll: 79, Film: 1254079, Page: 170B.

¹⁵ United States Census Bureau, Twelfth Census of the United States, 1900, National Archives and Records Administration, Washington, D.C., Oakland Ward 3, Alameda, California, Roll: 82, Page: 13A.

¹⁶ Online Archive of California, "Guide to the Oliver Family Photograph Collection", UC Berkeley:2009, website: <http://www.oac.cdlib.org/findaid/ark:/13030/ft0q2n99r1/> accessed February, 2013.

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William Letts Oliver initially gained familiarity with an explosive called guncotton while manufacturing collodion for his photography hobby.¹⁷ As early as 1870, European explosive companies were experimenting with nitrated guncotton in and by 1875 it was manufactured in England under the name “tonite.”¹⁸ By 1877 Oliver had left Chile and was mining in the western United States. Engineers working on the Sutro Tunnel in the Comstock needed an explosive that would remain stable at the high temperatures underground to complete the tunnel, and Oliver was able to solve the problem by substituting tonite for more volatile compounds.¹⁹

The California Cap Company

In 1877 William Letts Oliver was inspired by his success with tonite to leave mining and establish the Tonite Powder Company, on a portion of the former Stege Ranch.²⁰ In the 1870s all blasting caps in the United States had to be imported from Europe. Not only were they expensive, but the timing of deliveries was uncertain, creating business difficulties for the powder plant. Oliver was determined to create his own caps in order to protect the tonite factory business. He experimented until he came up with a blasting cap that was safer to use and had better detonating qualities than imported detonators. Oliver and his partner Freeborn Fletter founded the California Cap Company. It was located adjacent to the Tonite Powder Company a 160 acre parcel carved out of the southern portion of Stege Ranch.²¹ California Cap Company, which went on to operate on the site for nearly seven decades, was the first manufacturer of blasting caps in the United States. Richard Stege, meanwhile, continued to reside on the ranch, and contracted with Tonite Powder and California Cap to transport their products to the railroad.²² The California Cap Company was located on the parcel that is currently the Richmond Field Station. The Tonite Powder Company appears to have been located to the east on the parcel that became the Stauffer Chemical Company and later the Zeneca site, although its exact location is unclear.

The Tonite and California Cap factories, which were the first of several gunpowder and chemical companies in the region, were separated by the Stege agricultural warehouse for safety.²³ The explosives industry during this era was an extremely dangerous one. A horrific explosion in 1882 at the nearby Vulcan Powder Company caused 11 deaths and destroyed the plant.²⁴ Between 1882 and 1918 the Hercules and Atlas plants suffered numerous explosions which destroyed plant buildings and killed a total of 64 workers.²⁵ Despite its focus on safety, the California Cap Company had accidents as well. Two of its Chinese workers were killed in 1917 when one of them dropped a tray of caps. In 1941 an explosion caused a fire and critically injured a worker.²⁶

¹⁷ “Blasting Cap Industry”, Vol. 1, No. 7, November 1922, p. 222.

¹⁸ G.A. Price Cuxson, ed., “Society of Engineers: Transactions for 1889”, E. & F. N. Spon, London: 1890, p. 95.

¹⁹ Pacific Mining News, Supplement to Engineering & Mining Journal-Press, “Industrial Notes: Developing of the Blasting Cap Industry”, Vol. 1, No. 7, November 1922, p. 222.

²⁰ Oliver, p. 1.

²¹ Pacific Mining News, Supplement to Engineering & Mining Journal-Press, “Industrial Notes: Developing of the Blasting Cap Industry”, Vol. 1, No. 7, November 1922, p. 222.

²² Nilda Rego, “Enterprising Stege lost all and died without a penny”, Time Out, March 27, 1994, p. 2, column 4.

²³ Oliver, p. 1.

²⁴ Munro-Fraser, p. 424.

²⁵ Purcell, p. 648.

²⁶ Contra Costa County Standard, “Stege Powder Plant Blast; One Near Death”, June 6, 1941, p. 1A.

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William Letts Oliver continued to innovate throughout his long career in the chemical and explosives industries. In 1888 he formed the American Lucol Company adjacent to the California Cap Company property.²⁷ The Lucol plant was at what is currently the southeastern corner of the Richmond Field Station, at the approximate location of Building 163. Lucol manufactured a linseed oil substitute.²⁸ The factory was dismantled and relocated to New Jersey circa 1900.²⁹ In 1903 the Hotaling Briquette Works opened on Lucol's site at the southeast corner of the current Richmond Field station property.³⁰ Later known as the U.S. Briquette Company, the plant appears to have operated at this location until at least 1917.³¹ The U.S. Briquette Company buildings were demolished sometime in the 1960s.

The Oliver family aggressively promoted their products both through advertising and publishing. The California Cap Company sponsored or published both articles and book-length treatises on the use of explosives. Safety was a key element of the company image, a topic of company-sponsored technical writing as well as a selling point in advertisements.³² The Tonite Powder Company's product was known even outside the United States, and by the end of the nineteenth century the powder's explosive properties were considered comparable to the finest English products.³³ Oliver's sons Roland and Edwin Letts Oliver both graduated from UC Berkeley's College of Mining in 1900. Roland Oliver seems to have spent his entire career working in the family enterprises, while Edwin worked at California Cap between mining and other ventures. The Oliver family also became benefactors of the university, and in 1917 the California Cap Company donated substantial amounts of their products to the College of Mining including 500 electric detonators, 500 delayed action exploders, and 500 blasting caps.³⁴

Eventually the Tonite factory appears to have been incorporated into the California Cap Company. The Olivers also formed an entity named Pacific Cartridge Company circa 1910. The Pacific Cartridge Company operated from the California Cap plant during World War I.³⁵ By 1916 there were at least a dozen buildings on the site. When Oliver died in 1918 his son Roland Oliver took over as president of California Cap Company. By 1922 Roland's brother Leslie Oliver was assistant manager of the plant and Edwin Letts Oliver was a director.³⁶ Roland Oliver substantially expanded the California Cap Company after he took over as president. During this era the plant grew to include 150 buildings and a horse-drawn tram line.³⁷

During the late nineteenth and early twentieth century the California Cap Company was one of the most important local employers.³⁸ As the twentieth century progressed more heavy industry came to Contra Costa County, and by

²⁷ Oliver, p. 1.

²⁸ Max Wilhelm Von Bernewitz, *Cyanide Practice, 1910 – 1913*, Dewey Publishing Company: 1913, p. 327.

²⁹ Oliver, p. 1.

³⁰ Oliver, p. 2.

³¹ Hulanksi, p. 354.

³² Halbert Powers Gillette, *Rock Excavation: Methods and Cost*, M.C. Clark, New York: 1904, x.

³³ Manual Eissler, *A Handbook on Modern Explosives*, Crosby, Lockwood & son, London: 1897, p. 117.

³⁴ University of California, *The University of California Chronicle*, University of California Press, January, 1917, p. 92.

³⁵ R.L. Polk & Company, *Richmond and Contra Costa County Directory, 1914 – 1915*, Oakland, California: 1915.

³⁶ Pacific Mining News, p.222.

³⁷ University of California, Berkeley, *Current Conditions Report*, Prepared by Tetra Tech EM Inc., November 21, 2008, p. 11.

³⁸ Marguerite Clausen, "On the Waterfront: An Oral History of Richmond, California", Regional Oral History Office, University of California, Berkeley, 1990, p. 21.

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1940 the county was second only to Los Angeles in overall industrial production.³⁹ The nineteenth-century California Cap Company was dwarfed by the scale of some of the newer enterprises, and its physical plant and technology were aging. During World War II California Cap was able to stay open by producing delayed action incendiary bombs that were used against Japan.⁴⁰ The California Cap Company could not survive the transition to a peacetime economy, however, and by 1949 the plant was closed and the Oliver family looking for a buyer.

University Research/Richmond Field Station

After World War II UC Berkeley's Engineering Department needed an off-campus location in order to perform experiments that required more space than a laboratory. Department Chair Morrrough P. O' Brien and others in the department were performing experiments with sewage, sea water, and other materials unsuited to use on a crowded campus. They also wanted a location that was not too remote. The University purchased the California Cap Company from the Oliver family for the use of the Engineering Department in 1950.⁴¹

The Richmond Field Station has been the location of a research overseen by numerous UC Berkeley departments over the years. The Sanitary Engineering Research Laboratory (SERL) was one of the first departments to undertake research at the site. SERL focused primarily on sewage treatment technology, and also researched pollution control and disposal of solid and liquid waste.⁴² Other early projects at the field station included sea water distillation, heat transfer, and cyclic stress research.⁴³

At first the Department of Engineering utilized the buildings left behind by the California Cap Company. The Department established a machine shop, computer shop, receiving facility, mail service, and other facilities in addition to laboratories in the old detonator company buildings.⁴⁴ The current Buildings 102, 110, 118, 128, 150, 152 175, and 176 all date to the cap company era and have been repurposed for the Richmond Field Station. They also constructed new buildings as funds became available, and by the mid-1950s five new buildings had been completed at the Richmond Field Station.⁴⁵ By the 1970s the department had conducted many experiments at the Richmond Field Station that could not have been performed on the main campus.⁴⁶

Building 112

Building 112 was constructed in 1964 on the site of seven former California Cap Company buildings.⁴⁷ It is in the southeastern portion of the Richmond Field Station, where the early SERL activities were centered. The large building originally housed offices, classrooms, and laboratories.⁴⁸ It housed a wet chemistry laboratory as late as

³⁹ Purcell, p. 649.

⁴⁰ Oliver, p. 1.

⁴¹ P.H. McGauhey, "The Sanitary Engineering Research Laboratory: Administration, Research and Consultation, 1950-1975 – An Interview Conducted by Malca Call", Regional Oral History Office, University of California, Berkeley, 1974, p. 70.

⁴² University of California, Berkeley, 2008, p. 13.

⁴³ University of California, Berkeley, Department of Engineering, "Richmond Field Station Open House", May 28, 1952, p. 3 – 4.

⁴⁴ McGauhey, p. 71.

⁴⁵ University of California, Berkeley, Department of Engineering, "Guide for Engineering Field Station Inspection", undated, p. 3.

⁴⁶ University of California, Berkeley, 2008, p. 21.

⁴⁷ University of California, Berkeley, 2008, p. 149.

⁴⁸ University of California, Berkeley, 2008, p. 13.

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2008, though at that time it was being phased out of use.⁴⁹ It is currently devoted to bioengineering and public health offices.⁵⁰

Evaluation

The following provides an evaluation of Building 112 under each NRHP/CRHR criteria.

Building 112 does not appear to meet the criteria for listing in NRHP/CRHR because it lacks historical significance. The structure has served various functions throughout its lifetime and as such lacks the strength of association necessary to be considered historically significant in relation to any particular events or persons (Criteria A/1 and B/2).

The simple building lacks any identifiable architectural stylistic design and does not embody distinctive architectural or engineering qualities of type, period, or method of construction (Criterion C/3). In rare instances, buildings themselves can serve as sources of important information, however this building is not a principal source of important information in this regard (Criterion D/4).

⁴⁹ University of California, Berkeley, 2008, p. 25.

⁵⁰ Shackleton, 2013.

State of California – The Resources Agency
DEPARTMENT OF PARKS AND RECREATION
PRIMARY RECORD

Primary # _____
HRI # _____
Trinomial _____
NRHP Status Code _____

Other Listings _____
Review Code _____ Reviewer _____ Date _____

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*Resource Name or # (Assigned by recorder) Richmond Field Station Building 113

P1. Other Identifier: Richmond Field Station Building 113

*P2. Location: Not for Publication Unrestricted

*a. County Contra Costa

and (P2b and P2c or P2d. Attach a Location Map as necessary.)

*b. USGS 7.5' Quad Richmond Date 1984 T _____; R _____; ¼ of Sec _____; Diablo B.M.

c. Address _____ City _____ Zip _____

d. UTM: (give more than one for large and/or linear resources) Zone 10; 558507 mE/ 4196406 mN

e. Other Locational Data: (e.g., parcel #, directions to resource, elevation, etc., as appropriate)

*P3a. Description: (Describe resource and its major elements. Include design, materials, condition, alterations, size, setting, and boundaries)

Building 113 is in the southern portion of the Richmond Field Station. It is a 1,800 square foot prefabricated building, constructed in 1982. It is single story and rectangular in plan.

The building is topped with a very shallow pitched gable roof with large vents in the gables. Its walls are corrugated steel and lack fenestration. An industrial metal entrance door is centered in its southwest elevation and its northwest elevation features a large roll-up door. The building has large vents in the walls near the ground. It is surrounded by a grassy area and shrubbery. (See Continuation Sheet)

*P3b. Resource Attributes: (List attributes and codes) HP4: Ancillary Building

*P4. Resources Present: Building Structure Object Site District Element of District Other (Isolates, etc.)



P5b. Description of Photo: (View, date, accession #) Photograph 1: Northeast and northwest facades of building, camera facing south, January 4, 2012.

*P6. Date Constructed/Age and Sources:

Historic Prehistoric Both
1981/UC Berkeley records

*P7. Owner and Address:

U.C. Berkeley
1301 South 46th Street
Richmond, California 94804

*P8. Recorded by: (Name, affiliation, address)

Kara Brunzell & Julia Mates
Tetra Tech

1999 Harrison Street, Ste 500
Oakland, CA 94612

*P9. Date Recorded: January 4, 2013

*P10. Survey Type: (Describe) Intensive

*P11. Report Citation: (Cite survey report and other sources, or enter "none.") Historic

Properties Survey Report for Portions of the Richmond Field Station prepared by Tetra Tech, Inc, 2013.

*Attachments: NONE Location Map Sketch Map Continuation Sheet Building, Structure, and Object Record Archaeological Record
 District Record Linear Feature Record Milling Station Record Rock Art Record Artifact Record Photograph Record
 Other (list) _____

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*NRHP Status Code 6Z

*Resource Name or # (Assigned by recorder) Richmond Field Station Building 113

B1. Historic Name: _____

B2. Common Name: Building 113

B3. Original Use: Storage B4. Present Use: Storage

*B5. Architectural Style: Vernacular

*B6. Construction History: (Construction date, alteration, and date of alterations) Constructed in 1982

*B7. Moved? No Yes Unknown Date: _____ Original Location: _____

*B8. Related Features: _____

B9. Architect: Unknown b. Builder: Unknown

*B10. Significance: Theme N/A Area N/A

Period of Significance N/A Property Type N/A Applicable Criteria N/A

(Discuss importance in terms of historical or architectural context as defined by theme, period, and geographic scope. Also address integrity.)

Building 113 at Richmond Field Station does not appear to meet the criteria for listing in the National Register of Historic Places (NRHP). Furthermore, the building has been evaluated in accordance with Section 15064.5(a)(2)-(3) of the CEQA Guidelines, using the criteria outlined in Section 5024.1 of the California Public Resources Code, and does not appear to meet the significance criteria as outlined in these guidelines. Therefore, the building is not eligible for listing in the California Register of Historical Resources (CRHR). (See Continuation Sheet.)

B11. Additional Resource Attributes: (List attributes and codes)

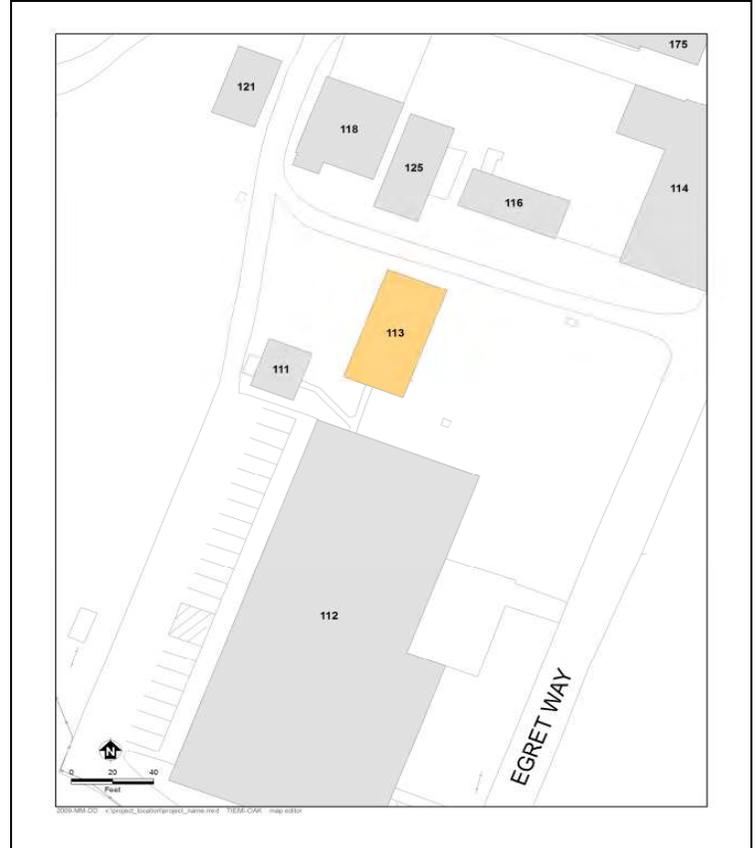
*B12. References: See footnotes

B13. Remarks:

*B14. Evaluator: Kara Brunzell

*Date of Evaluation: January 2013

(This space reserved for official comments.)



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P3a. Description (continued)

Building 113 was constructed in 1982 as a storage and support facility for SERL. The prefabricated steel building appears to have been assembled by Richmond Field Station maintenance workers, who also built its slab foundation.¹ Its use has continued unaltered. The building is not of historic age as it is 31 years old.

B10. Significance (continued)

Historic Context

Europeans arrived in what would become Contra Costa County in 1772, when a Spanish expedition led by Pedro Fages discovered the San Pablo Bay and the confluence of the Sacramento and San Joaquin rivers.² Though subsequent Spanish expeditions passed through the region the Spanish do not appear to have settled in the area during the mission period. In the 1820s and 1830s the Mexican government began granting large tracts of land in the area to its citizens, including Ranchos San Pablo, San Ramon, and Pinole. The first permanent non-native settlers were Francisco Castro and his wife Maria Gabriela Berryessa. The Mexican government granted the 18,000 acre Rancho San Pablo to the Castros in 1823.³ Americans began farming in Contra Costa County in the late 1830s, and by 1882 2/3 of the cultivated land in the county was devoted to wheat production.⁴

Minna C. C. Quilfelt (or Quilfeldt) purchased 600 acres of Rancho San Pablo in 1852 and 1853.⁵ Adjacent to San Francisco Bay in what would eventually become the southern portion of the City of Richmond, a wharf and produce warehouse were constructed on the ranch in the 1860s to ship agricultural produce to the San Francisco markets from Rancho San Pablo as well as the Quilfelt ranch. The warehouse and wharf were used to transport cattle, grain, fruit, and in later years the frogs' legs raised by Richard Stege for the San Francisco restaurant market.⁶ German native Richard Stege settled on Rancho San Pablo in the late 1860s after stints in the gold fields and the Siberian fur trade. He married Minna Quilfelt, who was a widow, in 1870.⁷ Minna Quilfelt Stege died in 1879, leaving the ranch to Stege and her daughter Edith. Stege began selling off portions of his ranch to raise money while continuing his frog-raising and other ventures. A town named Stege formed on Richard Stege's holdings, and by the late nineteenth century several industries, including the California Cap Works, the United States Briquette Company, the Stauffer Chemical Works and the Stege Lumber Manufacturing Company, were operating from portions of the Stege Ranch.⁸ Richmond incorporated in 1905, and by 1917 was already the largest city in Contra Costa County.⁹ Stege was eventually absorbed into Richmond as the latter grew.

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¹ University of California, Berkeley, File "Building 113," located in vertical files in Room 148, Richmond Field Station.

² Mildred B. Hoover, Hero E. Rensch, Ethel G. Rensch, Douglas E. Kyle, *Historic Spots in California, Fourth Edition*, Stanford University Press, Stanford, California: 1958, p. 129.

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The Tonite and California Cap factories, which were the first of several gunpowder and chemical companies in the region, were separated by the Stege agricultural warehouse for safety.²⁴ The explosives industry during this era was an extremely dangerous one. A horrific explosion in 1882 at the nearby Vulcan Powder Company caused 11 deaths and destroyed the plant.²⁵ Between 1882 and 1918 the Hercules and Atlas plants suffered numerous explosions which destroyed plant buildings and killed a total of 64 workers.²⁶ Despite its focus on safety, the California Cap Company had accidents as well. Two of its Chinese workers were killed in 1917 when one of them dropped a tray of caps. In 1941 an explosion caused a fire and critically injured a worker.²⁷

William Letts Oliver continued to innovate throughout his long career in the chemical and explosives industries. In 1888 he formed the American Lucol Company adjacent to the California Cap Company property.²⁸ The Lucol

¹⁸ Pacific Mining News, p. 222.

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²⁰ Pacific Mining News, p. 222.

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²³ Nilda Rego, “Enterprising Stege lost all and died without a penny”, Time Out, March 27, 1994, p. 2, column 4.

²⁴ Oliver, p. 1.

²⁵ Munro-Fraser, p. 424.

²⁶ Purcell, p. 648.

²⁷ Contra Costa County Standard, “Stege Powder Plant Blast; One Near Death”, June 6, 1941, p. 1A.

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plant was at what is currently the southeastern corner of the Richmond Field Station, at the approximate location of Building 163. Lucol manufactured a linseed oil substitute.²⁹ The factory was dismantled and relocated to New Jersey circa 1900.³⁰ In 1903 the Hotaling Briquette Works opened on Lucol's site at the southeast corner of the current Richmond Field station property.³¹ Later known as the U.S. Briquette Company, the plant appears to have operated at this location until at least 1917.³² The U.S. Briquette Company buildings were demolished sometime in the 1960s.

The Oliver family aggressively promoted their products both through advertising and publishing. The California Cap Company sponsored or published both articles and book-length treatises on the use of explosives. Safety was a key element of the company image, a topic of company-sponsored technical writing as well as a selling point in advertisements.³³ The Tonite Powder Company's product was known even outside the United States, and by the end of the nineteenth century the powder's explosive properties were considered comparable to the finest English products.³⁴ Oliver's sons Roland and Edwin Letts Oliver both graduated from UC Berkeley's College of Mining in 1900. Roland Oliver seems to have spent his entire career working in the family enterprises, while Edwin worked at California Cap between mining and other ventures. The Oliver family also became benefactors of the university, and in 1917 the California Cap Company donated substantial amounts of their products to the College of Mining including 500 electric detonators, 500 delayed action exploders, and 500 blasting caps.³⁵

Eventually the Tonite factory appears to have been incorporated into the California Cap Company. The Olivers also formed an entity named Pacific Cartridge Company circa 1910. The Pacific Cartridge Company operated from the California Cap plant during World War I.³⁶ By 1916 there were at least a dozen buildings on the site. When Oliver died in 1918 his son Roland Oliver took over as president of California Cap Company. By 1922 Roland's brother Leslie Oliver was assistant manager of the plant and Edwin Letts Oliver was a director.³⁷ Roland Oliver substantially expanded the California Cap Company after he took over as president. During this era the plant grew to include 150 buildings and a horse-drawn tram line.³⁸

During the late nineteenth and early twentieth century the California Cap Company was one of the most important local employers.³⁹ As the twentieth century progressed more heavy industry came to Contra Costa County, and by 1940 the county was second only to Los Angeles in overall industrial production.⁴⁰ The nineteenth-century California Cap Company was dwarfed by the scale of some of the newer enterprises, and its physical plant and technology were aging. During World War II California Cap was able to stay open by producing delayed action

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³⁰ Oliver, p. 1.

³¹ Oliver, p. 2.

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³³ Halbert Powers Gillette, *Rock Excavation: Methods and Cost*, M.C. Clark, New York: 1904, x.

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³⁹ Marguerite Clausen, "On the Waterfront: An Oral History of Richmond, California", Regional Oral History Office, University of California, Berkeley, 1990, p. 21.

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incendiary bombs that were used against Japan.⁴¹ The California Cap Company could not survive the transition to a peacetime economy, however, and by 1949 the plant was closed and the Oliver family looking for a buyer.

University Research/Richmond Field Station

After World War II UC Berkeley's Engineering Department needed an off-campus location in order to perform experiments that required more space than a laboratory. Department Chair Morrrough P. O' Brien and others in the department were performing experiments with sewage, sea water, and other materials unsuited to use on a crowded campus. They also wanted a location that was not too remote. The University purchased the California Cap Company from the Oliver family for the use of the Engineering Department in 1950.⁴²

The Richmond Field Station has been the location of a research overseen by numerous UC Berkeley departments over the years. The Sanitary Engineering Research Laboratory (SERL) was one of the first departments to undertake research at the site. SERL focused primarily on sewage treatment technology, and also researched pollution control and disposal of solid and liquid waste.⁴³ Other early projects at the field station included sea water distillation, heat transfer, and cyclic stress research.⁴⁴

At first the Department of Engineering utilized the buildings left behind by the California Cap Company. The Department established a machine shop, computer shop, receiving facility, mail service, and other facilities in addition to laboratories in the old detonator company buildings.⁴⁵ The current Buildings 102, 110, 118, 128, 150, 152 175, and 176 all date to the cap company era and have been repurposed for the Richmond Field Station. They also constructed new buildings as funds became available, and by the mid-1950s five new buildings had been completed at the Richmond Field Station.⁴⁶ By the 1970s the department had conducted many experiments at the Richmond Field Station that could not have been performed on the main campus.

Evaluation

The following provides an evaluation of Building 113 under each NRHP/CRHR criteria.

Building 113 does not appear to meet the criteria for listing in NRHP/CRHR because it lacks historical significance. The structure has served as a storage facility throughout its lifetime and lacks the strength of association necessary to be considered historically significant in relation to any particular events or persons (Criteria A/1 and B/2).

The utilitarian building lacks any identifiable architectural stylistic design and does not embody distinctive architectural or engineering qualities of type, period, or method of construction (Criterion C/3). In rare instances, buildings themselves can serve as sources of important information, however this building is not a principal source of important information in this regard (Criterion D/4).

⁴¹ Oliver, p. 1.

⁴² P.H. McGauhey, "The Sanitary Engineering Research Laboratory: Administration, Research and Consultation, 1950-1975 – An Interview Conducted by Malca Call", Regional Oral History Office, University of California, Berkeley, 1974, p. 70.

⁴³ University of California, Berkeley, 2008, p. 13.

⁴⁴ University of California, Berkeley, Department of Engineering, "Richmond Field Station Open House", May 28, 1952, p. 3 – 4.

⁴⁵ McGauhey, p. 71.

⁴⁶ University of California, Berkeley, Department of Engineering, "Guide for Engineering Field Station Inspection", undated, p. 3.

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As a storage facility, Building 113 does not meet the standard of exceptional importance required for properties under 50 years old to be eligible to the NHRP (Criterion G).

State of California – The Resources Agency
DEPARTMENT OF PARKS AND RECREATION
PRIMARY RECORD

Primary # _____
HRI # _____
Trinomial _____
NRHP Status Code _____

Other Listings _____
Review Code _____ Reviewer _____ Date _____

Page 1 of 8

*Resource Name or # (Assigned by recorder) Richmond Field Station Building 114

P1. Other Identifier: Richmond Field Station Building 114

***P2. Location:** Not for Publication Unrestricted

***a. County** Contra Costa

and (P2b and P2c or P2d. Attach a Location Map as necessary.)

***b. USGS 7.5' Quad** Richmond **Date** 1984 **T** _____; **R** _____; $\frac{1}{4}$ of **Sec** _____; Diablo **B.M.**

c. Address _____ City _____ Zip _____

d. UTM: (give more than one for large and/or linear resources) Zone 10; 558551 mE/ 4196433 mN

e. Other Locational Data: (e.g., parcel #, directions to resource, elevation, etc., as appropriate)

***P3a. Description:** (Describe resource and its major elements. Include design, materials, condition, alterations, size, setting, and boundaries)

Building 114 is in the southern portion of the Richmond Field Station on the west side of Egret Road. Its primary façade faces northeast; it is an L-shaped, single story, with a one-and-one-half story wing, 4,523 square foot building constructed circa 1930. The one-and-one-half story of the building is topped with a front gabled roof that ties into a shed roof section at its southeast. Rafter tails and purlins are exposed at the eaves. The walls and roof are of corrugated metal. Most of the fenestration is multi-light, fixed, wood sashes. The main entrance, centered in the northeast elevation, has a wood paneled and replacement industrial door, both with windows. There is a large sliding door at the east end of the elevation. The doors are accessed by a concrete loading dock that has a set of wooden stairs in front of the main entrance. (See Continuation Sheet)

***P3b. Resource Attributes:** (List attributes and codes) HP4: Ancillary Building

***P4. Resources Present:** Building Structure Object Site District Element of District Other (Isolates, etc.)



P5b. Description of Photo: (View, date, accession #) Photograph 1: Northeast facade of building, camera facing west, January 4, 2013

***P6. Date Constructed/Age and Sources:**

Historic Prehistoric Both

Circa the 1930s/Sanborn maps

***P7. Owner and Address:**

U.C. Berkeley

1301 South 46th Street

Richmond, California 94804

***P8. Recorded by:** (Name, affiliation, address)

Kara Brunzell & Julia Mates

Tetra Tech

1999 Harrison Street, Ste 500

Oakland, CA 94612

***P9. Date Recorded:** January 4, 2013

***P10. Survey Type:** (Describe) Intensive

***P11. Report Citation:** (Cite survey report and other sources, or enter "none.") Historic Properties Survey Report for Portions of the

Richmond Field Station prepared by Tetra Tech, Inc. 2013.

***Attachments:** NONE Location Map Sketch Map Continuation Sheet Building, Structure, and Object Record Archaeological Record District Record Linear Feature Record Milling Station Record Rock Art Record Artifact Record Photograph Record Other (list) _____

*Resource Name or # (Assigned by recorder) Richmond Field Station Building 114

B1. Historic Name: California Cap Company Building 81

B2. Common Name: Building 114

B3. Original Use: Unknown B4. Present Use: Storage

*B5. Architectural Style: Vernacular

*B6. Construction History: (Construction date, alteration, and date of alterations) Constructed circa 1930s

Circa 1955: northwest addition constructed

*B7. Moved? No Yes Unknown Date: _____ Original Location: _____

*B8. Related Features: _____

B9. Architect: Unknown b. Builder: Unknown

*B10. Significance: Theme N/A Area N/A

Period of Significance N/A Property Type N/A Applicable Criteria N/A

(Discuss importance in terms of historical or architectural context as defined by theme, period, and geographic scope. Also address integrity.)

Building 114 at Richmond Field Station does not appear to meet the criteria for listing in the National Register of Historic Places (NRHP). Furthermore, the building has been evaluated in accordance with Section 15064.5(a)(2)-(3) of the CEQA Guidelines, using the criteria outlined in Section 5024.1 of the California Public Resources Code, and does not appear to meet the significance criteria as outlined in these guidelines. Therefore, the building is not eligible for listing in the California Register of Historical Resources (CRHR). (See Continuation Sheet.)

B11. Additional Resource Attributes: (List attributes and codes)

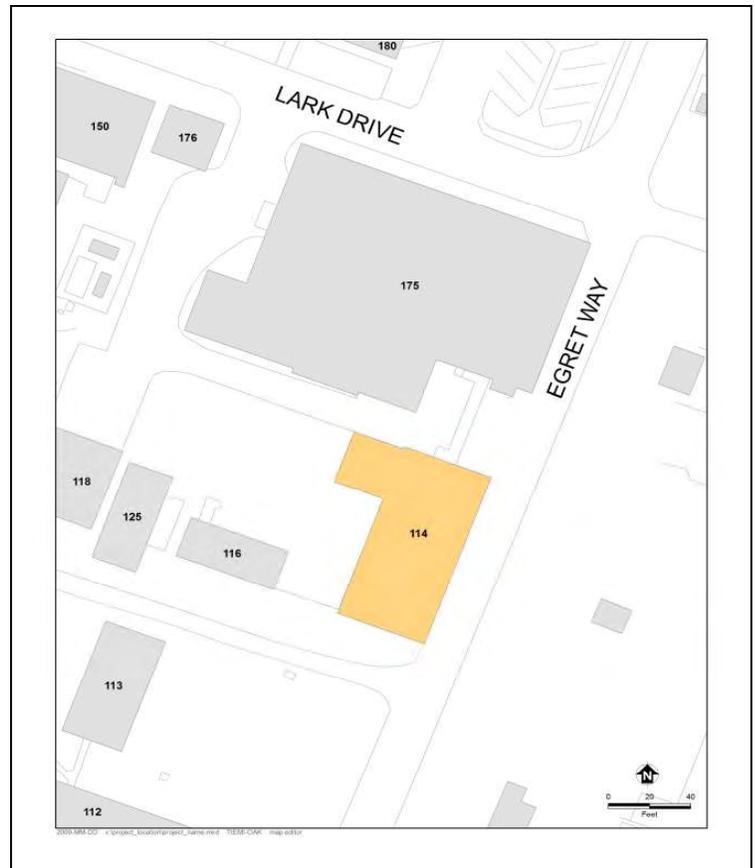
*B12. References: See Footnotes

B13. Remarks:

*B14. Evaluator: Kara Brunzell

*Date of Evaluation: January 2013

(This space reserved for official comments.)



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P3a. Description (continued)

A single story, shed roof addition projects from the northwest end of the building. It features a large sliding door that faces northeast. A large opening on the southeast elevation appears to be sealed from the interior.

Building 114, originally labeled “Building 81” was constructed circa 1930 by the California Cap Company or the Pacific Cartridge Company. It was adjacent to the Pacific Cartridge Company’s factory and was a warehouse for the cartridges produced there. The original building was rectangular in plan, oriented along Heron Drive. After UC Berkeley purchased the property in 1950, it used the warehouse to store building materials for use in building maintenance on the property.¹ Aerial photographs show that the University constructed an addition at the northwest end of the building circa 1955. The building is currently used for building maintenance equipment.

B10. Significance (continued)

Historic Context

Europeans arrived in what would become Contra Costa County in 1772, when a Spanish expedition led by Pedro Fages discovered the San Pablo Bay and the confluence of the Sacramento and San Joaquin rivers.² Though subsequent Spanish expeditions passed through the region the Spanish do not appear to have settled in the area during the mission period. In the 1820s and 1830s the Mexican government began granting large tracts of land in the area to its citizens, including Ranchos San Pablo, San Ramon, and Pinole. The first permanent non-native settlers were Francisco Castro and his wife Maria Gabriela Berryessa. The Mexican government granted the 18,000 acre Rancho San Pablo to the Castros in 1823.³ Americans began farming in Contra Costa County in the late 1830s, and by 1882 2/3 of the cultivated land in the county was devoted to wheat production.⁴

Minna C. C. Quilfelt (or Quilfeldt) purchased 600 acres of Rancho San Pablo in 1852 and 1853.⁵ Adjacent to San Francisco Bay in what would eventually become the southern portion of the City of Richmond, a wharf and produce warehouse were constructed on the ranch in the 1860s to ship agricultural produce to the San Francisco markets from Rancho San Pablo as well as the Quilfelt ranch. The warehouse and wharf were used to transport cattle, grain, fruit, and in later years the frogs’ legs raised by Richard Stege for the San Francisco restaurant market.⁶ German native Richard Stege settled on Rancho San Pablo in the late 1860s after stints in the gold fields and the Siberian fur trade. He married Minna Quilfelt, who was a widow, in 1870.⁷ Minna Quilfelt Stege died in 1879, leaving the ranch to Stege and her daughter Edith. Stege began selling off portions of his ranch to raise money while continuing his frog-raising and other ventures. A town named Stege formed on Richard Stege’s holdings, and by the late nineteenth century several industries, including the California Cap Works, the United States Briquette Company, the Stauffer Chemical Works and the Stege Lumber Manufacturing Company, were

¹ Shackleton, 2013.

² Mildred B. Hoover, Hero E. Rensch, Ethel G. Rensch, Douglas E. Kyle, *Historic Spots in California, Fourth Edition*, Stanford University Press, Stanford, California: 1958, p. 129.

³ Donald Bastin, *Images of America: Richmond*, Arcadia Publishing, Charleston SC: 2003, p. 9.

⁴ J.P. Munro-Fraser, *History of Contra Costa County, California*, W.A. Slocum & Co., San Francisco: 1882, p. 55 – 57.

⁵ Evan Griffins, “Early History of Richmond”, December 1938, El Cerrito Historical Society, website: <http://www.elcerritowire.com/history/pages/EarlyRichmond.htm>, accessed January 2013.

⁶ Roland Oliver, “Recollections of Early Industries in Stege”, August 7, 1959, p. 1.

⁷ J.P. Munro-Fraser, p. 675.

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operating from portions of the Stege Ranch.⁸ Richmond incorporated in 1905, and by 1917 was already the largest city in Contra Costa County.⁹ Stege was eventually absorbed into Richmond as the latter grew.

The Explosives Industry in Contra Costa County

Swedish chemist Alfred Nobel laid the foundation for the high-explosives industry with his innovations beginning in 1860s, inventing first a detonator and then a blasting cap. In 1867 he invented dynamite, which was safer, cheaper, and more powerful than nitroglycerine, which had been the most commonly used explosive. Nobel licensed the Giant Powder Company to produce dynamite in California later that year. Giant was the first American company to produce dynamite, and its plant was initially located in Rock House Canyon, in what is today the City of San Francisco. The California Powder Works began manufacturing dynamite in the same area in 1869.¹⁰

The nineteenth century explosives industry was extremely dangerous, and as San Francisco's population grew explosives manufacturers needed to relocate. Contra Costa County across the bay was attractive since it was accessible due to its proximity to the harbor yet remote from population centers. In addition, the narrow canyons of Contra Costa County, which terminate in small bays, provided a natural geographical defense against explosions by allowing factory design that placed water between different facets of explosives manufacturing.¹¹

During the 1870s chemical and explosives manufacturers began opening in the vicinity of what would eventually become Richmond. The Tonite Powder Company, Western Mineral Company, and California Cap Company were established at 1877 on the Stege ranch. The San Francisco explosives companies soon followed those explosive companies across the bay to Contra Costa County. In 1880, Giant relocated to Point Pinole, changing its name to the Atlas Powder Company. The California Powder Works soon followed, building a new factory in Hercules, which was named for the brand under which the company sold its powder.¹² The Vulcan Powder Works and Judson Powder works also opened in the Stege Ranch area during this era, consolidating Contra Costa County's position as the cradle of the California explosives industry. The East Bay dominated California explosives manufacturing into the twentieth century. In 1902 California had only one powder factory outside Contra Costa and Alameda counties.¹³

William Letts Oliver

William Letts Oliver was born in Chile to English parents in 1844. He attended the University of Edinburgh and became a mining engineer. After returning to Chile, Oliver ran an explosives factory, which was nationalized by the Chilean government in 1864. After the loss of his factory, Oliver left Chile for San Francisco.¹⁴ William Letts Oliver and his wife Carrie lived in Oakland, from about 1880 until Oliver's death in 1918.¹⁵ The couple eventually

⁸ Frederick J. Hulaniski, *The History of Contra Costa County, California*. Elms Publishing Company, Berkeley, California: 1917, p. 354.

⁹ Hulaniski p. 288.

¹⁰ Ida Mae Purcell, *History of Contra Costa County*, The Gillick Press, Berkeley, California" 1940, p. 645 – 646.

¹¹ James E. Vance, *Geography and Urban Evolution in the San Francisco Bay Area*, University of California, Berkeley: 1964, p. 27.

¹² Purcell, p. 646.

¹³ Richmond Record, "Contra Costa County: Under the Vitascope", Richmond:1902.

¹⁴ Pacific Mining News, Supplement to Engineering & Mining Journal-Press, "Industrial Notes: Developing of the Blasting Cap Industry", Vol. 1, No. 7, November 1922, p. 222.

¹⁵ United States Census Bureau, Tenth Census of the United States, 1880, National Archives and Records Administration, Washington, D.C., San Francisco, California, Roll: 79, Film: 1254079, Page: 170B.

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had six children together: Roland, Edwin, Caroline, Anita, William Harold, and Albert.¹⁶ In addition his various professional activities William Letts Oliver was a yachtsman and an officer of the Bohemian Grove club in the early twentieth century. An avid amateur photographer throughout his lifetime, UC Berkeley's Bancroft Library has a collection of 2700 negatives and prints taken by Oliver and his son.¹⁷

William Letts Oliver initially gained familiarity with an explosive called guncotton while manufacturing collodion for his photography hobby.¹⁸ As early as 1870, European explosive companies were experimenting with nitrated guncotton in and by 1875 it was manufactured in England under the name "tonite."¹⁹ By 1877 Oliver had left Chile and was mining in the western United States. Engineers working on the Sutro Tunnel in the Comstock needed an explosive that would remain stable at the high temperatures underground to complete the tunnel, and Oliver was able to solve the problem by substituting tonite for more volatile compounds.²⁰

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¹⁷ Online Archive of California, "Guide to the Oliver Family Photograph Collection", UC Berkeley: 2009, website: <http://www.oac.cdlib.org/findaid/ark:/13030/ft0q2n99r1/> accessed February, 2013.

¹⁸ Pacific Mining News, p. 222.

¹⁹ G.A. Price Cuxson, ed., "Society of Engineers: Transactions for 1889", E. & F. N. Spon, London: 1890, p. 95.

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²⁷ Contra Costa County Standard, "Stege Powder Plant Blast; One Near Death", June 6, 1941, p. 1A.

²⁸ Oliver, p. 1.

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³³ Halbert Powers Gillette, *Rock Excavation: Methods and Cost*, M.C. Clark, New York: 1904, x.

³⁴ Manual Eissler, *A Handbook on Modern Explosives*, Crosby, Lockwood & son, London: 1897, p. 117.

³⁵ University of California, *The University of California Chronicle*, University of California Press, January, 1917, p. 92.

³⁶ R.L. Polk & Company, *Richmond and Contra Costa County Directory, 1914 – 1915*, Oakland, California: 1915.

³⁷ Pacific Mining News, p.222.

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³⁹ Marguerite Clausen, "On the Waterfront: An Oral History of Richmond, California", Regional Oral History Office, University of California, Berkeley, 1990, p. 21.

⁴⁰ Purcell, p. 649.

⁴¹ Oliver, p. 1.

⁴² P.H. McGauhey, "The Sanitary Engineering Research Laboratory: Administration, Research and Consultation, 1950-1975 – An Interview Conducted by Malca Call", Regional Oral History Office, University of California, Berkeley, 1974, p. 70.

⁴³ University of California, Berkeley, 2008, p. 13.

⁴⁴ University of California, Berkeley, Department of Engineering, "Richmond Field Station Open House", May 28, 1952, p. 3 – 4.

⁴⁵ McGauhey, p. 71.

⁴⁶ University of California, Berkeley, Department of Engineering, "Guide for Engineering Field Station Inspection", undated, p. 3.

Page 8 of 8 *Resource Name or # (Assigned by recorder) Richmond Field Station Building 114
*Recorded by Tetra Tech *Date January 4, 2013 Continuation Update

Building 114 does not appear to meet the criteria for listing in NRHP/CRHR because it lacks historical significance. The structure has primarily been used for storage throughout its lifetime and as such lacks the strength of association necessary to be considered historically significant in relation to any particular events or persons (Criteria A/1 and B/2).

The simple building lacks any identifiable architectural stylistic design and does not embody distinctive architectural or engineering qualities of type, period, or method of construction (Criterion C/3). In rare instances, buildings themselves can serve as sources of important information, however this building is not a principal source of important information in this regard (Criterion D/4).

State of California – The Resources Agency
DEPARTMENT OF PARKS AND RECREATION
PRIMARY RECORD

Primary # _____
HRI # _____
Trinomial _____
NRHP Status Code _____

Other Listings _____
Review Code _____ Reviewer _____ Date _____

Page 1 of 8

*Resource Name or # (Assigned by recorder) Richmond Field Station Building 116

P1. Other Identifier: Richmond Field Station Building 116

*P2. Location: Not for Publication Unrestricted

*a. County Contra Costa

and (P2b and P2c or P2d. Attach a Location Map as necessary.)

*b. USGS 7.5' Quad Richmond Date 1984 T _____; R _____; ¼ of Sec _____; Diablo B.M.

c. Address _____ City _____ Zip _____

d. UTM: (give more than one for large and/or linear resources) Zone 10; 558525 mE/ 4196427 mN

e. Other Locational Data: (e.g., parcel #, directions to resource, elevation, etc., as appropriate)

*P3a. Description: (Describe resource and its major elements. Include design, materials, condition, alterations, size, setting, and boundaries)

Building 116 is in the southern portion of the Richmond Field Station. It is 967 square feet and was moved to its present location in 1964. The single story building is a rectangular, Butler Company prefabricated building topped with a front gabled roof. The walls and roof are corrugated metal. Fenestration is multi-light, fixed metal sashes, some of which are wire sashes. The entrance at the south end of the southeast elevation is a paneled wood door with a window. (See Continuation Sheet)

*P3b. Resource Attributes: (List attributes and codes) HP4: Ancillary Building

*P4. Resources Present: Building Structure Object Site District Element of District Other (Isolates, etc.)



P5b. Description of Photo: (View, date, accession #) Photograph 1: Southeast and northeast facades of building, camera facing southwest, January 4, 2013

*P6. Date Constructed/Age and Sources:

Historic Prehistoric Both

Unknown

*P7. Owner and Address:

U.C. Berkeley

1301 South 46th Street

Richmond, California 94804

*P8. Recorded by: (Name, affiliation, address)

Kara Brunzell & Julia Mates

Tetra Tech

1999 Harrison Street, Ste 500

Oakland, CA 94612

*P9. Date Recorded: January 4, 2013

*P10. Survey Type: (Describe) Intensive

*P11. Report Citation: (Cite survey report and other sources, or enter "none.") Historic Properties Survey Report for Portions of the Richmond Field Station prepared by Tetra

Tech, Inc, 2013.

*Attachments: NONE Location Map Sketch Map Continuation Sheet Building, Structure, and Object Record Archaeological Record
 District Record Linear Feature Record Milling Station Record Rock Art Record Artifact Record Photograph Record
 Other (list) _____

Page 2 of 8

*NRHP Status Code 6Z

*Resource Name or # (Assigned by recorder) Richmond Field Station Building 116

B1. Historic Name: _____

B2. Common Name: Building 116

B3. Original Use: Shop B4. Present Use: Shop

*B5. Architectural Style: Vernacular

*B6. Construction History: (Construction date, alteration, and date of alterations) Unknown

*B7. Moved? No Yes Unknown Date: 1961 Original Location: UCB Campus

*B8. Related Features: _____

B9. Architect: Unknown b. Builder: Unknown

*B10. Significance: Theme N/A Area N/A

Period of Significance N/A Property Type N/A Applicable Criteria N/A

(Discuss importance in terms of historical or architectural context as defined by theme, period, and geographic scope. Also address integrity.)

Building 116 at Richmond Field Station does not appear to meet the criteria for listing in the National Register of Historic Places (NRHP). Furthermore, the building has been evaluated in accordance with Section 15064.5(a)(2)-(3) of the CEQA Guidelines, using the criteria outlined in Section 5024.1 of the California Public Resources Code, and does not appear to meet the significance criteria as outlined in these guidelines. Therefore, the building is not eligible for listing in the California Register of Historical Resources (CRHR). (See Continuation Sheet.)

B11. Additional Resource Attributes: (List attributes and codes)

*B12. References: See Footnotes

B13. Remarks:

*B14. Evaluator: Kara Brunzell

*Date of Evaluation: January 2013

(This space reserved for official comments.)



Page 3 of 8 *Resource Name or # (Assigned by recorder) Richmond Field Station Building 116

*Recorded by Tetra Tech

*Date January 4, 2013 Continuation Update

P3a. Description (continued)

Building 116 was originally constructed on the UC Berkeley campus by the US Air Force. Its original construction date is unknown, but by 1961 it had outlived its purpose and the UC Regents decided to raze it. SERL had the building relocated to the Richmond Field Station at the end of 1961.¹ It has been used throughout its lifetime as a support and storage area.

B10. Significance (continued)

Historic Context

Europeans arrived in what would become Contra Costa County in 1772, when a Spanish expedition led by Pedro Fages discovered the San Pablo Bay and the confluence of the Sacramento and San Joaquin rivers.² Though subsequent Spanish expeditions passed through the region the Spanish do not appear to have settled in the area during the mission period. In the 1820s and 1830s the Mexican government began granting large tracts of land in the area to its citizens, including Ranchos San Pablo, San Ramon, and Pinole. The first permanent non-native settlers were Francisco Castro and his wife Maria Gabriela Berryessa. The Mexican government granted the 18,000 acre Rancho San Pablo to the Castros in 1823.³ Americans began farming in Contra Costa County in the late 1830s, and by 1882 2/3 of the cultivated land in the county was devoted to wheat production.⁴

Minna C. C. Quilfelt (or Quilfeldt) purchased 600 acres of Rancho San Pablo in 1852 and 1853.⁵ Adjacent to San Francisco Bay in what would eventually become the southern portion of the City of Richmond, a wharf and produce warehouse were constructed on the ranch in the 1860s to ship agricultural produce to the San Francisco markets from Rancho San Pablo as well as the Quilfelt ranch. The warehouse and wharf were used to transport cattle, grain, fruit, and in later years the frogs' legs raised by Richard Stege for the San Francisco restaurant market.⁶ German native Richard Stege settled on Rancho San Pablo in the late 1860s after stints in the gold fields and the Siberian fur trade. He married Minna Quilfelt, who was a widow, in 1870.⁷ Minna Quilfelt Stege died in 1879, leaving the ranch to Stege and her daughter Edith. Stege began selling off portions of his ranch to raise money while continuing his frog-raising and other ventures. A town named Stege formed on Richard Stege's holdings, and by the late nineteenth century several industries, including the California Cap Works, the United States Briquette Company, the Stauffer Chemical Works and the Stege Lumber Manufacturing Company, were operating from portions of the Stege Ranch.⁸ Richmond incorporated in 1905, and by 1917 was already the largest city in Contra Costa County.⁹ Stege was eventually absorbed into Richmond as the latter grew.

The Explosives Industry in Contra Costa County

¹ University of California, Berkeley, File "Building 116," located in vertical files in Room 148, Richmond Field Station.

² Mildred B. Hoover, Hero E. Rensch, Ethel G. Rensch, Douglas E. Kyle, *Historic Spots in California, Fourth Edition*, Stanford University Press, Stanford, California: 1958, p. 129.

³ Donald Bastin, *Images of America: Richmond*, Arcadia Publishing, Charleston SC: 2003, p. 9.

⁴ J.P. Munro-Fraser, *History of Contra Costa County, California*, W.A. Slocum & Co., San Francisco: 1882, p. 55 – 57.

⁵ Evan Griffins, "Early History of Richmond", December 1938, El Cerrito Historical Society, website: <http://www.elcerritowire.com/history/pages/EarlyRichmond.htm>, accessed January 2013.

⁶ Roland Oliver, "Recollections of Early Industries in Stege", August 7, 1959, p. 1.

⁷ J.P. Munro-Fraser, p. 675.

⁸ Frederick J. Hulaniski, *The History of Contra Costa County, California*. Elms Publishing Company, Berkeley, California: 1917, p. 354.

⁹ Hulaniski p. 288.

Page 4 of 8 *Resource Name or # (Assigned by recorder) Richmond Field Station Building 116

*Recorded by Tetra Tech

*Date January 4, 2013 Continuation Update

Swedish chemist Alfred Nobel laid the foundation for the high-explosives industry with his innovations beginning in 1860s, inventing first a detonator and then a blasting cap. In 1867 he invented dynamite, which was safer, cheaper, and more powerful than nitroglycerine, which had been the most commonly used explosive. Nobel licensed the Giant Powder Company to produce dynamite in California later that year. Giant was the first American company to produce dynamite, and its plant was initially located in Rock House Canyon, in what is today the City of San Francisco. The California Powder Works began manufacturing dynamite in the same area in 1869.¹⁰

The nineteenth century explosives industry was extremely dangerous, and as San Francisco's population grew explosives manufacturers needed to relocate. Contra Costa County across the bay was attractive since it was accessible due to its proximity to the harbor yet remote from population centers. In addition, the narrow canyons of Contra Costa County, which terminate in small bays, provided a natural geographical defense against explosions by allowing factory design that placed water between different facets of explosives manufacturing.¹¹

During the 1870s chemical and explosives manufacturers began opening in the vicinity of what would eventually become Richmond. The Tonite Powder Company, Western Mineral Company, and California Cap Company were established at 1877 on the Stege ranch. The San Francisco explosives companies soon followed those explosive companies across the bay to Contra Costa County. In 1880, Giant relocated to Point Pinole, changing its name to the Atlas Powder Company. The California Powder Works soon followed, building a new factory in Hercules, which was named for the brand under which the company sold its powder.¹² The Vulcan Powder Works and Judson Powder works also opened in the Stege Ranch area during this era, consolidating Contra Costa County's position as the cradle of the California explosives industry. The East Bay dominated California explosives manufacturing into the twentieth century. In 1902 California had only one powder factory outside Contra Costa and Alameda counties.¹³

William Letts Oliver

William Letts Oliver was born in Chile to English parents in 1844. He attended the University of Edinburgh and became a mining engineer. After returning to Chile, Oliver ran an explosives factory, which was nationalized by the Chilean government in 1864. After the loss of his factory, Oliver left Chile for San Francisco.¹⁴ William Letts Oliver and his wife Carrie lived in Oakland, from about 1880 until Oliver's death in 1918.¹⁵ The couple eventually had six children together: Roland, Edwin, Caroline, Anita, William Harold, and Albert.¹⁶ In addition his various professional activities William Letts Oliver was a yachtsman and an officer of the Bohemian Grove club in the

¹⁰ Ida Mae Purcell, *History of Contra Costa County*, The Gillick Press, Berkeley, California" 1940, p. 645 – 646.

¹¹ James E. Vance, *Geography and Urban Evolution in the San Francisco Bay Area*, University of California, Berkeley: 1964, p. 27.

¹² Purcell, p. 646.

¹³ Richmond Record, "Contra Costa County: Under the Vitascope", Richmond:1902.

¹⁴ Pacific Mining News, Supplement to Engineering & Mining Journal-Press, "Industrial Notes: Developing of the Blasting Cap Industry", Vol. 1, No. 7, November 1922, p. 222.

¹⁵ United States Census Bureau, Tenth Census of the United States, 1880, National Archives and Records Administration, Washington, D.C., San Francisco, California, Roll: 79, Film: 1254079, Page: 170B.

¹⁶ United States Census Bureau, Twelfth Census of the United States, 1900, National Archives and Records Administration, Washington, D.C., Oakland Ward 3, Alameda, California, Roll: 82, Page: 13A.

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*Recorded by Tetra Tech

*Date January 4, 2013 Continuation Update

early twentieth century. An avid amateur photographer throughout his lifetime, UC Berkeley's Bancroft Library has a collection of 2700 negatives and prints taken by Oliver and his son.¹⁷

William Letts Oliver initially gained familiarity with an explosive called guncotton while manufacturing collodion for his photography hobby.¹⁸ As early as 1870, European explosive companies were experimenting with nitrated guncotton in and by 1875 it was manufactured in England under the name "tonite."¹⁹ By 1877 Oliver had left Chile and was mining in the western United States. Engineers working on the Sutro Tunnel in the Comstock needed an explosive that would remain stable at the high temperatures underground to complete the tunnel, and Oliver was able to solve the problem by substituting tonite for more volatile compounds.²⁰

The California Cap Company

In 1877 William Letts Oliver was inspired by his success with tonite to leave mining and establish the Tonite Powder Company, on a portion of the former Stege Ranch.²¹ In the 1870s all blasting caps in the United States had to be imported from Europe. Not only were they expensive, but the timing of deliveries was uncertain, creating business difficulties for the powder plant. Oliver was determined to create his own caps in order to protect the tonite factory business. He experimented until he came up with a blasting cap that was safer to use and had better detonating qualities than imported detonators. Oliver and his partner Freeborn Fletter founded the California Cap Company. It was located adjacent to the Tonite Powder Company a 160 acre parcel carved out of the southern portion of Stege Ranch.²² California Cap Company, which went on to operate on the site for nearly seven decades, was the first manufacturer of blasting caps in the United States. Richard Stege, meanwhile, continued to reside on the ranch, and contracted with Tonite Powder and California Cap to transport their products to the railroad.²³ The California Cap Company was located on the parcel that is currently the Richmond Field Station. The Tonite Powder Company appears to have been located to the east on the parcel that became the Stauffer Chemical Company and later the Zeneca site, although its exact location is unclear.

The Tonite and California Cap factories, which were the first of several gunpowder and chemical companies in the region, were separated by the Stege agricultural warehouse for safety.²⁴ The explosives industry during this era was an extremely dangerous one. A horrific explosion in 1882 at the nearby Vulcan Powder Company caused 11 deaths and destroyed the plant.²⁵ Between 1882 and 1918 the Hercules and Atlas plants suffered numerous explosions which destroyed plant buildings and killed a total of 64 workers.²⁶ Despite its focus on safety, the California Cap Company had accidents as well. Two of its Chinese workers were killed in 1917 when one of them dropped a tray of caps. In 1941 an explosion caused a fire and critically injured a worker.²⁷

¹⁷ Online Archive of California, "Guide to the Oliver Family Photograph Collection", UC Berkeley: 2009, website: <http://www.oac.cdlib.org/findaid/ark:/13030/ft0q2n99r1/> accessed February, 2013.

¹⁸ Pacific Mining News, p. 222.

¹⁹ G.A. Price Cuxson, ed., "Society of Engineers: Transactions for 1889", E. & F. N. Spon, London: 1890, p. 95.

²⁰ Pacific Mining News, p. 222.

²¹ Oliver, p. 1.

²² Pacific Mining News, p. 222.

²³ Nilda Rego, "Enterprising Stege lost all and died without a penny", Time Out, March 27, 1994, p. 2, column 4.

²⁴ Oliver, p. 1.

²⁵ Munro-Fraser, p. 424.

²⁶ Purcell, p. 648.

²⁷ Contra Costa County Standard, "Stege Powder Plant Blast; One Near Death", June 6, 1941, p. 1A.

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*Recorded by Tetra Tech

*Date January 4, 2013 Continuation Update

William Letts Oliver continued to innovate throughout his long career in the chemical and explosives industries. In 1888 he formed the American Lucol Company adjacent to the California Cap Company property.²⁸ The Lucol plant was at what is currently the southeastern corner of the Richmond Field Station, at the approximate location of Building 163. Lucol manufactured a linseed oil substitute.²⁹ The factory was dismantled and relocated to New Jersey circa 1900.³⁰ In 1903 the Hotaling Briquette Works opened on Lucol's site at the southeast corner of the current Richmond Field station property.³¹ Later known as the U.S. Briquette Company, the plant appears to have operated at this location until at least 1917.³² The U.S. Briquette Company buildings were demolished sometime in the 1960s.

The Oliver family aggressively promoted their products both through advertising and publishing. The California Cap Company sponsored or published both articles and book-length treatises on the use of explosives. Safety was a key element of the company image, a topic of company-sponsored technical writing as well as a selling point in advertisements.³³ The Tonite Powder Company's product was known even outside the United States, and by the end of the nineteenth century the powder's explosive properties were considered comparable to the finest English products.³⁴ Oliver's sons Roland and Edwin Letts Oliver both graduated from UC Berkeley's College of Mining in 1900. Roland Oliver seems to have spent his entire career working in the family enterprises, while Edwin worked at California Cap between mining and other ventures. The Oliver family also became benefactors of the university, and in 1917 the California Cap Company donated substantial amounts of their products to the College of Mining including 500 electric detonators, 500 delayed action exploders, and 500 blasting caps.³⁵

Eventually the Tonite factory appears to have been incorporated into the California Cap Company. The Olivers also formed an entity named Pacific Cartridge Company circa 1910. The Pacific Cartridge Company operated from the California Cap plant during World War I.³⁶ By 1916 there were at least a dozen buildings on the site. When Oliver died in 1918 his son Roland Oliver took over as president of California Cap Company. By 1922 Roland's brother Leslie Oliver was assistant manager of the plant and Edwin Letts Oliver was a director.³⁷ Roland Oliver substantially expanded the California Cap Company after he took over as president. During this era the plant grew to include 150 buildings and a horse-drawn tram line.³⁸

During the late nineteenth and early twentieth century the California Cap Company was one of the most important local employers.³⁹ As the twentieth century progressed more heavy industry came to Contra Costa County, and by

²⁸ Oliver, p. 1.

²⁹ Max Wilhelm Von Bernewitz, *Cyanide Practice, 1910 – 1913*, Dewey Publishing Company: 1913, p. 327.

³⁰ Oliver, p. 1.

³¹ Oliver, p. 2.

³² Hulanksi, p. 354.

³³ Halbert Powers Gillette, *Rock Excavation: Methods and Cost*, M.C. Clark, New York: 1904, x.

³⁴ Manual Eissler, *A Handbook on Modern Explosives*, Crosby, Lockwood & son, London: 1897, p. 117.

³⁵ University of California, *The University of California Chronicle*, University of California Press, January, 1917, p. 92.

³⁶ R.L. Polk & Company, *Richmond and Contra Costa County Directory, 1914 – 1915*, Oakland, California: 1915.

³⁷ Pacific Mining News, p.222.

³⁸ University of California, Berkeley, *Current Conditions Report*, Prepared by Tetra Tech EM Inc., November 21, 2008, p. 11.

³⁹ Marguerite Clausen, "On the Waterfront: An Oral History of Richmond, California", Regional Oral History Office, University of California, Berkeley, 1990, p. 21.

Page 7 of 8 *Resource Name or # (Assigned by recorder) Richmond Field Station Building 116

*Recorded by Tetra Tech

*Date January 4, 2013 Continuation Update

1940 the county was second only to Los Angeles in overall industrial production.⁴⁰ The nineteenth-century California Cap Company was dwarfed by the scale of some of the newer enterprises, and its physical plant and technology were aging. During World War II California Cap was able to stay open by producing delayed action incendiary bombs that were used against Japan.⁴¹ The California Cap Company could not survive the transition to a peacetime economy, however, and by 1949 the plant was closed and the Oliver family looking for a buyer.

University Research/Richmond Field Station

After World War II UC Berkeley's Engineering Department needed an off-campus location in order to perform experiments that required more space than a laboratory. Department Chair Morrrough P. O' Brien and others in the department were performing experiments with sewage, sea water, and other materials unsuited to use on a crowded campus. They also wanted a location that was not too remote. The University purchased the California Cap Company from the Oliver family for the use of the Engineering Department in 1950.⁴²

The Richmond Field Station has been the location of a research overseen by numerous UC Berkeley departments over the years. The Sanitary Engineering Research Laboratory (SERL) was one of the first departments to undertake research at the site. SERL focused primarily on sewage treatment technology, and also researched pollution control and disposal of solid and liquid waste.⁴³ Other early projects at the field station included sea water distillation, heat transfer, and cyclic stress research.⁴⁴

At first the Department of Engineering utilized the buildings left behind by the California Cap Company. The Department established a machine shop, computer shop, receiving facility, mail service, and other facilities in addition to laboratories in the old detonator company buildings.⁴⁵ The current Buildings 102, 110, 118, 128, 150, 152 175, and 176 all date to the cap company era and have been repurposed for the Richmond Field Station. They also constructed new buildings as funds became available, and by the mid-1950s five new buildings had been completed at the Richmond Field Station.⁴⁶ By the 1970s the department had conducted many experiments at the Richmond Field Station that could not have been performed on the main campus.

Evaluation

The following provides an evaluation of Building 116 under each NRHP/CRHR criteria.

Building 116 does not appear to meet the criteria for listing in NRHP/CRHR because it lacks historical significance. The structure has primarily been used for storage throughout its lifetime and as such lacks the strength of association necessary to be considered historically significant in relation to any particular events or persons (Criteria A/1 and B/2).

⁴⁰ Purcell, p. 649.

⁴¹ Oliver, p. 1.

⁴² P.H. McGauhey, "The Sanitary Engineering Research Laboratory: Administration, Research and Consultation, 1950-1975 – An Interview Conducted by Malca Call", Regional Oral History Office, University of California, Berkeley, 1974, p. 70.

⁴³ University of California, Berkeley, 2008, p. 13.

⁴⁴ University of California, Berkeley, Department of Engineering, "Richmond Field Station Open House", May 28, 1952, p. 3 – 4.

⁴⁵ McGauhey, p. 71.

⁴⁶ University of California, Berkeley, Department of Engineering, "Guide for Engineering Field Station Inspection", undated, p. 3.

Page 8 of 8 *Resource Name or # (Assigned by recorder) Richmond Field Station Building 116

*Recorded by Tetra Tech *Date January 4, 2013 Continuation Update

The utilitarian prefabricated building lacks any identifiable architectural stylistic design and does not embody distinctive architectural or engineering qualities of type, period, or method of construction (Criterion C/3). In rare instances, buildings themselves can serve as sources of important information, however this building is not a principal source of important information in this regard (Criterion D/4).

State of California – The Resources Agency
DEPARTMENT OF PARKS AND RECREATION
PRIMARY RECORD

Primary # _____
HRI # _____
Trinomial _____
NRHP Status Code _____

Other Listings _____
Review Code _____ Reviewer _____ Date _____

Page 1 of 7

*Resource Name or # (Assigned by recorder) Richmond Field Station Building 117

P1. Other Identifier: Richmond Field Station Building 117

***P2. Location:** Not for Publication Unrestricted

***a. County** Contra Costa

and (P2b and P2c or P2d. Attach a Location Map as necessary.)

***b. USGS 7.5' Quad** Richmond **Date** 1984 **T** _____; **R** _____; _____ **¼ of Sec** _____; Diablo **B.M.**

c. Address _____ City _____ Zip _____

d. UTM: (give more than one for large and/or linear resources) Zone 10; 558618 mE/ 4196446 mN

e. Other Locational Data: (e.g., parcel #, directions to resource, elevation, etc., as appropriate)

***P3a. Description:** (Describe resource and its major elements. Include design, materials, condition, alterations, size, setting, and boundaries)

Building 117 is along the southeastern border of the Richmond Field Station. It is a single story and rectangular in plan. The building is topped with a front gabled roof that has exposed wood rafter tails and purlins at the eaves. The walls and roof are corrugated metal. Fenestration is fixed wood sashes. The entrance at the north end of the northwest elevation is double paneled wood doors with windows. Building 117's construction date is unknown. Aerial photographs show it was moved to its present location circa 1990. Its materials indicate that it was constructed prior to 1950 during the California Cap Company era, but research failed to reveal its original use and location. It was used as a maintenance shop in the 1990s and is currently used for storage and support.

***P3b. Resource Attributes:** (List attributes and codes) HP4: Ancillary Building

***P4. Resources Present:** Building Structure Object Site District Element of District Other (Isolates, etc.)



P5b. Description of Photo: (View, date, accession #) Photograph 1: Northwest and southwest facades of building, camera facing west, January 4, 2013

***P6. Date Constructed/Age and Sources:**

Historic Prehistoric Both

Unknown

***P7. Owner and Address:**

U.C. Berkeley

1301 South 46th Street

Richmond, California 94804

***P8. Recorded by:** (Name, affiliation, address)

Kara Brunzell & Julia Mates

Tetra Tech

1999 Harrison Street, Ste 500

Oakland, CA 94612

***P9. Date Recorded:** January 4, 2013

***P10. Survey Type:** (Describe) Intensive

***P11. Report Citation:** (Cite survey report and other sources, or enter "none.") Historic Properties Survey Report for Portions of the Richmond Field Station prepared by Tetra Tech, Inc, 2013.

***Attachments:** NONE Location Map Sketch Map Continuation Sheet Building, Structure, and Object Record Archaeological Record

District Record Linear Feature Record Milling Station Record Rock Art Record Artifact Record Photograph Record

Other (list) _____

*Resource Name or # (Assigned by recorder) Richmond Field Station Building 117

B1. Historic Name: _____

B2. Common Name: Building 117

B3. Original Use: Unknown B4. Present Use: Storage

*B5. Architectural Style: Vernacular

*B6. Construction History: (Construction date, alteration, and date of alterations) Construction date unknown, moved circa 1990

*B7. Moved? No Yes Unknown Date: 1990 Original Location: Unknown

*B8. Related Features: _____

B9. Architect: Unknown b. Builder: Unknown

*B10. Significance: Theme N/A Area N/A

Period of Significance N/A Property Type N/A Applicable Criteria N/A

(Discuss importance in terms of historical or architectural context as defined by theme, period, and geographic scope. Also address integrity.)

Building 117 at Richmond Field Station does not appear to meet the criteria for listing in the National Register of Historic Places (NRHP). Furthermore, the building has been evaluated in accordance with Section 15064.5(a)(2)-(3) of the CEQA Guidelines, using the criteria outlined in Section 5024.1 of the California Public Resources Code, and does not appear to meet the significance criteria as outlined in these guidelines. Therefore, the building is not eligible for listing in the California Register of Historical Resources (CRHR).

B11. Additional Resource Attributes: (List attributes and codes)

*B12. References: See Footnotes

B13. Remarks:

*B14. Evaluator: Kara Brunzell

*Date of Evaluation: January 2013

(This space reserved for official comments.)



Page 3 of 7 *Resource Name or # (Assigned by recorder) Richmond Field Station Building 117

*Recorded by Tetra Tech *Date January 4, 2013 Continuation Update

B10. Significance (continued)

Historic Context

Europeans arrived in what would become Contra Costa County in 1772, when a Spanish expedition led by Pedro Fages discovered the San Pablo Bay and the confluence of the Sacramento and San Joaquin rivers.¹ Though subsequent Spanish expeditions passed through the region the Spanish do not appear to have settled in the area during the mission period. In the 1820s and 1830s the Mexican government began granting large tracts of land in the area to its citizens, including Ranchos San Pablo, San Ramon, and Pinole. The first permanent non-native settlers were Francisco Castro and his wife Maria Gabriela Berryessa. The Mexican government granted the 18,000 acre Rancho San Pablo to the Castros in 1823.² Americans began farming in Contra Costa County in the late 1830s, and by 1882 2/3 of the cultivated land in the county was devoted to wheat production.³

Minna C. C. Quilfelt (or Quilfeldt) purchased 600 acres of Rancho San Pablo in 1852 and 1853.⁴ Adjacent to San Francisco Bay in what would eventually become the southern portion of the City of Richmond, a wharf and produce warehouse were constructed on the ranch in the 1860s to ship agricultural produce to the San Francisco markets from Rancho San Pablo as well as the Quilfelt ranch. The warehouse and wharf were used to transport cattle, grain, fruit, and in later years the frogs' legs raised by Richard Stege for the San Francisco restaurant market.⁵ German native Richard Stege settled on Rancho San Pablo in the late 1860s after stints in the gold fields and the Siberian fur trade. He married Minna Quilfelt, who was a widow, in 1870.⁶ Minna Quilfelt Stege died in 1879, leaving the ranch to Stege and her daughter Edith. Stege began selling off portions of his ranch to raise money while continuing his frog-raising and other ventures. A town named Stege formed on Richard Stege's holdings, and by the late nineteenth century several industries, including the California Cap Works, the United States Briquette Company, the Stauffer Chemical Works and the Stege Lumber Manufacturing Company, were operating from portions of the Stege Ranch.⁷ Richmond incorporated in 1905, and by 1917 was already the largest city in Contra Costa County.⁸ Stege was eventually absorbed into Richmond as the latter grew.

The Explosives Industry in Contra Costa County

Swedish chemist Alfred Nobel laid the foundation for the high-explosives industry with his innovations beginning in 1860s, inventing first a detonator and then a blasting cap. In 1867 he invented dynamite, which was safer, cheaper, and more powerful than nitroglycerine, which had been the most commonly used explosive. Nobel licensed the Giant Powder Company to produce dynamite in California later that year. Giant was the first American company to produce dynamite, and its plant was initially located in Rock House Canyon, in what is today the City of San Francisco. The California Powder Works began manufacturing dynamite in the same area in 1869.⁹

¹ Mildred B. Hoover, Hero E. Rensch, Ethel G. Rensch, Douglas E. Kyle, *Historic Spots in California, Fourth Edition*, Stanford University Press, Stanford, California: 1958, p. 129.

² Donald Bastin, *Images of America: Richmond*, Arcadia Publishing, Charleston SC: 2003, p. 9.

³ J.P. Munro-Fraser, *History of Contra Costa County, California*, W.A. Slocum & Co., San Francisco: 1882, p. 55 – 57.

⁴ Evan Griffins, "Early History of Richmond", December 1938, El Cerrito Historical Society, website: <http://www.elcerritowire.com/history/pages/EarlyRichmond.htm>, accessed January 2013.

⁵ Roland Oliver, "Recollections of Early Industries in Stege", August 7, 1959, p. 1.

⁶ J.P. Munro-Fraser, p. 675.

⁷ Frederick J. Hulaniski, *The History of Contra Costa County, California*. Elms Publishing Company, Berkeley, California: 1917, p. 354.

⁸ Hulaniski p. 288.

⁹ Ida Mae Purcell, *History of Contra Costa County*, The Gillick Press, Berkeley, California" 1940, p. 645 – 646.

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The nineteenth century explosives industry was extremely dangerous, and as San Francisco's population grew explosives manufacturers needed to relocate. Contra Costa County across the bay was attractive since it was accessible due to its proximity to the harbor yet remote from population centers. In addition, the narrow canyons of Contra Costa County, which terminate in small bays, provided a natural geographical defense against explosions by allowing factory design that placed water between different facets of explosives manufacturing.¹⁰

During the 1870s chemical and explosives manufacturers began opening in the vicinity of what would eventually become Richmond. The Tonite Powder Company, Western Mineral Company, and California Cap Company were established at 1877 on the Stege ranch. The San Francisco explosives companies soon followed those explosive companies across the bay to Contra Costa County. In 1880, Giant relocated to Point Pinole, changing its name to the Atlas Powder Company. The California Powder Works soon followed, building a new factory in Hercules, which was named for the brand under which the company sold its powder.¹¹ The Vulcan Powder Works and Judson Powder works also opened in the Stege Ranch area during this era, consolidating Contra Costa County's position as the cradle of the California explosives industry. The East Bay dominated California explosives manufacturing into the twentieth century. In 1902 California had only one powder factory outside Contra Costa and Alameda counties.¹²

William Letts Oliver

William Letts Oliver was born in Chile to English parents in 1844. He attended the University of Edinburgh and became a mining engineer. After returning to Chile, Oliver ran an explosives factory, which was nationalized by the Chilean government in 1864. After the loss of his factory, Oliver left Chile for San Francisco.¹³ William Letts Oliver and his wife Carrie lived in Oakland, from about 1880 until Oliver's death in 1918.¹⁴ The couple eventually had six children together: Roland, Edwin, Caroline, Anita, William Harold, and Albert.¹⁵ In addition his various professional activities William Letts Oliver was a yachtsman and an officer of the Bohemian Grove club in the early twentieth century. An avid amateur photographer throughout his lifetime, UC Berkeley's Bancroft Library has a collection of 2700 negatives and prints taken by Oliver and his son.¹⁶

William Letts Oliver initially gained familiarity with an explosive called guncotton while manufacturing collodion for his photography hobby.¹⁷ As early as 1870, European explosive companies were experimenting with nitrated guncotton in and by 1875 it was manufactured in England under the name "tonite."¹⁸ By 1877 Oliver had left Chile and was mining in the western United States. Engineers working on the Sutro Tunnel in the Comstock

¹⁰ James E. Vance, *Geography and Urban Evolution in the San Francisco Bay Area*, University of California, Berkeley: 1964, p. 27.

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¹² Richmond Record, "Contra Costa County: Under the Vitascope", Richmond:1902.

¹³ Pacific Mining News, Supplement to Engineering & Mining Journal-Press, "Industrial Notes: Developing of the Blasting Cap Industry", Vol. 1, No. 7, November 1922, p. 222.

¹⁴ United States Census Bureau, Tenth Census of the United States, 1880, National Archives and Records Administration, Washington, D.C., San Francisco, California, Roll: 79, Film: 1254079, Page: 170B.

¹⁵ United States Census Bureau, Twelfth Census of the United States, 1900, National Archives and Records Administration, Washington, D.C., Oakland Ward 3, Alameda, California, Roll: 82, Page: 13A.

¹⁶ Online Archive of California, "Guide to the Oliver Family Photograph Collection", UC Berkeley: 2009, website: <http://www.oac.cdlib.org/findaid/ark:/13030/ft0q2n99r1/> accessed February, 2013.

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needed an explosive that would remain stable at the high temperatures underground to complete the tunnel, and Oliver was able to solve the problem by substituting tonite for more volatile compounds.¹⁹

The California Cap Company

In 1877 William Letts Oliver was inspired by his success with tonite to leave mining and establish the Tonite Powder Company, on a portion of the former Stege Ranch.²⁰ In the 1870s all blasting caps in the United States had to be imported from Europe. Not only were they expensive, but the timing of deliveries was uncertain, creating business difficulties for the powder plant. Oliver was determined to create his own caps in order to protect the tonite factory business. He experimented until he came up with a blasting cap that was safer to use and had better detonating qualities than imported detonators. Oliver and his partner Freeborn Fletter founded the California Cap Company. It was located adjacent to the Tonite Powder Company a 160 acre parcel carved out of the southern portion of Stege Ranch.²¹ California Cap Company, which went on to operate on the site for nearly seven decades, was the first manufacturer of blasting caps in the United States. Richard Stege, meanwhile, continued to reside on the ranch, and contracted with Tonite Powder and California Cap to transport their products to the railroad.²² The California Cap Company was located on the parcel that is currently the Richmond Field Station. The Tonite Powder Company appears to have been located to the east on the parcel that became the Stauffer Chemical Company and later the Zeneca site, although its exact location is unclear.

The Tonite and California Cap factories, which were the first of several gunpowder and chemical companies in the region, were separated by the Stege agricultural warehouse for safety.²³ The explosives industry during this era was an extremely dangerous one. A horrific explosion in 1882 at the nearby Vulcan Powder Company caused 11 deaths and destroyed the plant.²⁴ Between 1882 and 1918 the Hercules and Atlas plants suffered numerous explosions which destroyed plant buildings and killed a total of 64 workers.²⁵ Despite its focus on safety, the California Cap Company had accidents as well. Two of its Chinese workers were killed in 1917 when one of them dropped a tray of caps. In 1941 an explosion caused a fire and critically injured a worker.²⁶

William Letts Oliver continued to innovate throughout his long career in the chemical and explosives industries. In 1888 he formed the American Lucol Company adjacent to the California Cap Company property.²⁷ The Lucol plant was at what is currently the southeastern corner of the Richmond Field Station, at the approximate location of Building 163. Lucol manufactured a linseed oil substitute.²⁸ The factory was dismantled and relocated to New Jersey circa 1900.²⁹ In 1903 the Hotaling Briquette Works opened on Lucol's site at the southeast corner of the current Richmond Field station property.³⁰ Later known as the U.S. Briquette Company, the plant appears to have

¹⁹ Pacific Mining News, p. 222.

²⁰ Oliver, p. 1.

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²² Nilda Rego, "Enterprising Stege lost all and died without a penny", Time Out, March 27, 1994, p. 2, column 4.

²³ Oliver, p. 1.

²⁴ Munro-Fraser, p. 424.

²⁵ Purcell, p. 648.

²⁶ Contra Costa County Standard, "Stege Powder Plant Blast; One Near Death", June 6, 1941, p. 1A.

²⁷ Oliver, p. 1.

²⁸ Max Wilhelm Von Bernewitz, *Cyanide Practice, 1910 – 1913*, Dewey Publishing Company: 1913, p. 327.

²⁹ Oliver, p. 1.

³⁰ Oliver, p. 2.

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operated at this location until at least 1917.³¹ The U.S. Briquette Company buildings were demolished sometime in the 1960s.

The Oliver family aggressively promoted their products both through advertising and publishing. The California Cap Company sponsored or published both articles and book-length treatises on the use of explosives. Safety was a key element of the company image, a topic of company-sponsored technical writing as well as a selling point in advertisements.³² The Tonite Powder Company's product was known even outside the United States, and by the end of the nineteenth century the powder's explosive properties were considered comparable to the finest English products.³³ Oliver's sons Roland and Edwin Letts Oliver both graduated from UC Berkeley's College of Mining in 1900. Roland Oliver seems to have spent his entire career working in the family enterprises, while Edwin worked at California Cap between mining and other ventures. The Oliver family also became benefactors of the university, and in 1917 the California Cap Company donated substantial amounts of their products to the College of Mining including 500 electric detonators, 500 delayed action exploders, and 500 blasting caps.³⁴

Eventually the Tonite factory appears to have been incorporated into the California Cap Company. The Olivers also formed an entity named Pacific Cartridge Company circa 1910. The Pacific Cartridge Company operated from the California Cap plant during World War I.³⁵ By 1916 there were at least a dozen buildings on the site. When Oliver died in 1918 his son Roland Oliver took over as president of California Cap Company. By 1922 Roland's brother Leslie Oliver was assistant manager of the plant and Edwin Letts Oliver was a director.³⁶ Roland Oliver substantially expanded the California Cap Company after he took over as president. During this era the plant grew to include 150 buildings and a horse-drawn tram line.³⁷

During the late nineteenth and early twentieth century the California Cap Company was one of the most important local employers.³⁸ As the twentieth century progressed more heavy industry came to Contra Costa County, and by 1940 the county was second only to Los Angeles in overall industrial production.³⁹ The nineteenth-century California Cap Company was dwarfed by the scale of some of the newer enterprises, and its physical plant and technology were aging. During World War II California Cap was able to stay open by producing delayed action incendiary bombs that were used against Japan.⁴⁰ The California Cap Company could not survive the transition to a peacetime economy, however, and by 1949 the plant was closed and the Oliver family looking for a buyer.

University Research/Richmond Field Station

After World War II UC Berkeley's Engineering Department needed an off-campus location in order to perform experiments that required more space than a laboratory. Department Chair Morrrough P. O' Brien and others in the

³¹ Hulanksi, p. 354.

³² Halbert Powers Gillette, *Rock Excavation: Methods and Cost*, M.C. Clark, New York: 1904, x.

³³ Manual Eissler, *A Handbook on Modern Explosives*, Crosby, Lockwood & son, London: 1897, p. 117.

³⁴ University of California, *The University of California Chronicle*, University of California Press, January, 1917, p. 92.

³⁵ R.L. Polk & Company, *Richmond and Contra Costa County Directory, 1914 – 1915*, Oakland, California: 1915.

³⁶ Pacific Mining News, p.222.

³⁷ University of California, Berkeley, *Current Conditions Report*, Prepared by Tetra Tech EM Inc., November 21, 2008, p. 11.

³⁸ Marguerite Clausen, "On the Waterfront: An Oral History of Richmond, California", Regional Oral History Office, University of California, Berkeley, 1990, p. 21.

³⁹ Purcell, p. 649.

⁴⁰ Oliver, p. 1.

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department were performing experiments with sewage, sea water, and other materials unsuited to use on a crowded campus. They also wanted a location that was not too remote. The University purchased the California Cap Company from the Oliver family for the use of the Engineering Department in 1950.⁴¹

The Richmond Field Station has been the location of a research overseen by numerous UC Berkeley departments over the years. The Sanitary Engineering Research Laboratory (SERL) was one of the first departments to undertake research at the site. SERL focused primarily on sewage treatment technology, and also researched pollution control and disposal of solid and liquid waste.⁴² Other early projects at the field station included sea water distillation, heat transfer, and cyclic stress research.⁴³

At first the Department of Engineering utilized the buildings left behind by the California Cap Company. The Department established a machine shop, computer shop, receiving facility, mail service, and other facilities in addition to laboratories in the old detonator company buildings.⁴⁴ The current Buildings 102, 110, 118, 128, 150, 152 175, and 176 all date to the cap company era and have been repurposed for the Richmond Field Station. They also constructed new buildings as funds became available, and by the mid-1950s five new buildings had been completed at the Richmond Field Station.⁴⁵ By the 1970s the department had conducted many experiments at the Richmond Field Station that could not have been performed on the main campus.

Evaluation

The following provides an evaluation of Building 117 under each NRHP/CRHR criteria.

Building 117 does not appear to meet the criteria for listing in NHRP/CRHR because it lacks historical significance. The structure has served various functions throughout its lifetime and as such lacks the strength of association necessary to be considered historically significant in relation to any particular events or persons (Criteria A/1 and B/2).

The utilitarian building lacks any identifiable architectural stylistic design and does not embody distinctive architectural or engineering qualities of type, period, or method of construction (Criterion C/3). In rare instances, buildings themselves can serve as sources of important information, however this building is not a principal source of important information in this regard (Criterion D/4).

⁴¹ P.H. McGauhey, "The Sanitary Engineering Research Laboratory: Administration, Research and Consultation, 1950-1975 – An Interview Conducted by Malca Call", Regional Oral History Office, University of California, Berkeley, 1974, p. 70.

⁴² University of California, Berkeley, 2008, p. 13.

⁴³ University of California, Berkeley, Department of Engineering, "Richmond Field Station Open House", May 28, 1952, p. 3 – 4.

⁴⁴ McGauhey, p. 71.

⁴⁵ University of California, Berkeley, Department of Engineering, "Guide for Engineering Field Station Inspection", undated, p. 3.

State of California – The Resources Agency
DEPARTMENT OF PARKS AND RECREATION
PRIMARY RECORD

Primary # _____
HRI # _____
Trinomial _____
NRHP Status Code _____

Other Listings _____
Review Code _____ Reviewer _____ Date _____

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*Resource Name or # (Assigned by recorder) Richmond Field Station Building 118

P1. Other Identifier: Richmond Field Station Building 118

*P2. Location: Not for Publication Unrestricted

*a. County Contra Costa

and (P2b and P2c or P2d. Attach a Location Map as necessary.)

*b. USGS 7.5' Quad Richmond Date 1984 T _____; R _____; ¼ of Sec _____; Diablo B.M.

c. Address _____ City _____ Zip _____

d. UTM: (give more than one for large and/or linear resources) Zone 10; 558500 mE/ 4196438 mN

e. Other Locational Data: (e.g., parcel #, directions to resource, elevation, etc., as appropriate)

*P3a. Description: (Describe resource and its major elements. Include design, materials, condition, alterations, size, setting, and boundaries)

Building 118 is in the southern portion of the Richmond Field Station. It is west of Egret Way and adjacent to Building 125 with its primary façade facing northeast. The utilitarian building does not express any particular architectural style. It is 1,708 square feet and was constructed prior to 1940. It is a single story building with a rectangular plan. (See Continuation Sheet)

*P3b. Resource Attributes: (List attributes and codes) HP4: Ancillary Building

*P4. Resources Present: Building Structure Object Site District Element of District Other (Isolates, etc.)



P5b. Description of Photo: (View, date, accession #) Photograph 1: Southeast and northeast facades of building, camera facing west, January 4, 2013.

*P6. Date Constructed/Age and Sources:
 Historic Prehistoric Both

Circa 1930s/UC Berkeley records

*P7. Owner and Address:

U.C. Berkeley

1301 South 46th Street

Richmond, California 94804

*P8. Recorded by: (Name, affiliation, address)

Kara Brunzell & Julia Mates

Tetra Tech

1999 Harrison Street, Ste 500

Oakland, CA 94612

*P9. Date Recorded: January 4, 2013

*P10. Survey Type: (Describe) Intensive

*P11. Report Citation: (Cite survey report and other sources, or enter "none.") Historic

Properties Survey Report for Portions of the Richmond Field Station prepared by Tetra Tech, Inc. 2013.

*Attachments: NONE Location Map Sketch Map Continuation Sheet Building, Structure, and Object Record Archaeological Record
 District Record Linear Feature Record Milling Station Record Rock Art Record Artifact Record Photograph Record
 Other (list) _____

*Resource Name or # (Assigned by recorder) Richmond Field Station Building 118

B1. Historic Name: California Cap Company Building 149

B2. Common Name: Building 118

B3. Original Use: Fuel Oil Boiler B4. Present Use: Art practice

*B5. Architectural Style: Vernacular

*B6. Construction History: (Construction date, alteration, and date of alterations) Constructed circa 1930s,
dates of alterations unknown

*B7. Moved? No Yes Unknown Date: _____ Original Location: _____

*B8. Related Features: _____

B9. Architect: Unknown b. Builder: Unknown

*B10. Significance: Theme N/A Area N/A

Period of Significance N/A Property Type N/A Applicable Criteria N/A

(Discuss importance in terms of historical or architectural context as defined by theme, period, and geographic scope. Also address integrity.)

Building 118 at Richmond Field Station does not appear to meet the criteria for listing in the National Register of Historic Places (NRHP). Furthermore, the building has been evaluated in accordance with Section 15064.5(a)(2)-(3) of the CEQA Guidelines, using the criteria outlined in Section 5024.1 of the California Public Resources Code, and does not appear to meet the significance criteria as outlined in these guidelines. Therefore, the building is not eligible for listing in the California Register of Historical Resources (CRHR). (See Continuation Sheet.)

B11. Additional Resource Attributes: (List attributes and codes)

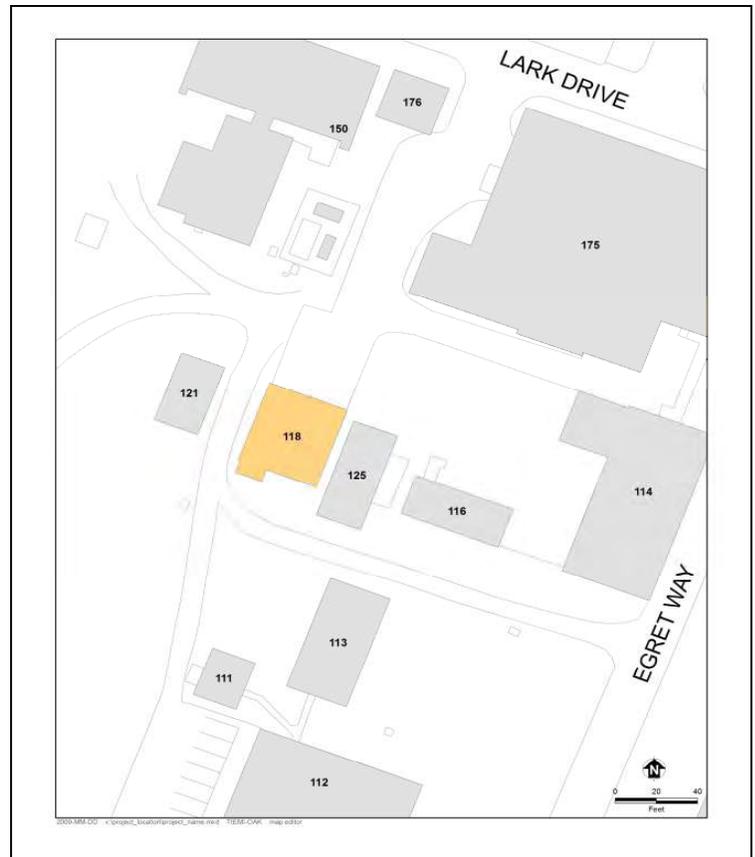
*B12. References: See Footnotes

B13. Remarks:

*B14. Evaluator: Kara Brunzell

*Date of Evaluation: January 2013

(This space reserved for official comments.)



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P3a. Description (continued)

The building is topped with a very shallow pitched roof with minimal eave overhang. The walls are clad in roof paper. Fenestration is a single multi-light, fixed wood sash adjacent to the primary entrance, and a single aluminum sliding sash at the rear (southwest) elevation. The primary entrance, at the east end of the northeast elevation, is a wood paneled door with a window. A large metal roll up door is centered in the façade.

The secondary entrance is sliding doors at the south end of the northwest elevation. A low shed roofed addition at the rear corner of the building has another wood paneled door, and a southwest facing window.

Building 118, originally labeled “Building 149” was constructed circa the 1930s by the California Cap Company. The building was constructed to house the fuel oil boiler for the plant. After UC Berkeley purchased the property in 1950, the building was used as a fire test research area and maintenance shop. Fire safety research studies were done at Richmond Field Station to determine the safety of a variety of products including plastics and airplane restrooms.¹ Building 118 also housed the plumbing shop for the Richmond Field Station until 2009. It is currently used as an art facility for graduate students.² The wood siding has been covered with roof paper. A small addition at the southwest corner was constructed in the modern period. Dates for these alterations are unknown.

B10. Significance (continued)

Historic Context

Europeans arrived in what would become Contra Costa County in 1772, when a Spanish expedition led by Pedro Fages discovered the San Pablo Bay and the confluence of the Sacramento and San Joaquin rivers.³ Though subsequent Spanish expeditions passed through the region the Spanish do not appear to have settled in the area during the mission period. In the 1820s and 1830s the Mexican government began granting large tracts of land in the area to its citizens, including Ranchos San Pablo, San Ramon, and Pinole. The first permanent non-native settlers were Francisco Castro and his wife Maria Gabriela Berryessa. The Mexican government granted the 18,000 acre Rancho San Pablo to the Castros in 1823.⁴ Americans began farming in Contra Costa County in the late 1830s, and by 1882 2/3 of the cultivated land in the county was devoted to wheat production.⁵

Minna C. C. Quilfelt (or Quilfeldt) purchased 600 acres of Rancho San Pablo in 1852 and 1853.⁶ Adjacent to San Francisco Bay in what would eventually become the southern portion of the City of Richmond, a wharf and produce warehouse were constructed on the ranch in the 1860s to ship agricultural produce to the San Francisco markets from Rancho San Pablo as well as the Quilfelt ranch. The warehouse and wharf were used to transport cattle, grain, fruit, and in later years the frogs’ legs raised by Richard Stege for the San Francisco restaurant market.⁷ German native Richard Stege settled on Rancho San Pablo in the late 1860s after stints in the gold fields

¹ University of California, Berkeley, 2008, p. 14.

² Shackleton, 2013.

³ Mildred B. Hoover, Hero E. Rensch, Ethel G. Rensch, Douglas E. Kyle, *Historic Spots in California, Fourth Edition*, Stanford University Press, Stanford, California: 1958, p. 129.

⁴ Donald Bastin, *Images of America: Richmond*, Arcadia Publishing, Charleston SC: 2003, p. 9.

⁵ J.P. Munro-Fraser, *History of Contra Costa County, California*, W.A. Slocum & Co., San Francisco: 1882, p. 55 – 57.

⁶ Evan Griffins, “Early History of Richmond”, December 1938, El Cerrito Historical Society, website: <http://www.elcerritowire.com/history/pages/EarlyRichmond.htm>, accessed January 2013.

⁷ Roland Oliver, “Recollections of Early Industries in Stege”, August 7, 1959, p. 1.

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and the Siberian fur trade. He married Minna Quilfelt, who was a widow, in 1870.⁸ Minna Quilfelt Stege died in 1879, leaving the ranch to Stege and her daughter Edith. Stege began selling off portions of his ranch to raise money while continuing his frog-raising and other ventures. A town named Stege formed on Richard Stege's holdings, and by the late nineteenth century several industries, including the California Cap Works, the United States Briquette Company, the Stauffer Chemical Works and the Stege Lumber Manufacturing Company, were operating from portions of the Stege Ranch.⁹ Richmond incorporated in 1905, and by 1917 was already the largest city in Contra Costa County.¹⁰ Stege was eventually absorbed into Richmond as the latter grew.

The Explosives Industry in Contra Costa County

Swedish chemist Alfred Nobel laid the foundation for the high-explosives industry with his innovations beginning in 1860s, inventing first a detonator and then a blasting cap. In 1867 he invented dynamite, which was safer, cheaper, and more powerful than nitroglycerine, which had been the most commonly used explosive. Nobel licensed the Giant Powder Company to produce dynamite in California later that year. Giant was the first American company to produce dynamite, and its plant was initially located in Rock House Canyon, in what is today the City of San Francisco. The California Powder Works began manufacturing dynamite in the same area in 1869.¹¹

The nineteenth century explosives industry was extremely dangerous, and as San Francisco's population grew explosives manufacturers needed to relocate. Contra Costa County across the bay was attractive since it was accessible due to its proximity to the harbor yet remote from population centers. In addition, the narrow canyons of Contra Costa County, which terminate in small bays, provided a natural geographical defense against explosions by allowing factory design that placed water between different facets of explosives manufacturing.¹²

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⁸ J.P. Munro-Fraser, p. 675.

⁹ Frederick J. Hulaniski, *The History of Contra Costa County, California*. Elms Publishing Company, Berkeley, California: 1917, p. 354.

¹⁰ Hulaniski p. 288.

¹¹ Ida Mae Purcell, *History of Contra Costa County*, The Gillick Press, Berkeley, California" 1940, p. 645 – 646.

¹² James E. Vance, *Geography and Urban Evolution in the San Francisco Bay Area*, University of California, Berkeley: 1964, p. 27.

¹³ Purcell, p. 646.

¹⁴ Richmond Record, "Contra Costa County: Under the Vitascope", Richmond:1902.

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¹⁵ Pacific Mining News, Supplement to Engineering & Mining Journal-Press, "Industrial Notes: Developing of the Blasting Cap Industry", Vol. 1, No. 7, November 1922, p. 222.

¹⁶ United States Census Bureau, Tenth Census of the United States, 1880, National Archives and Records Administration, Washington, D.C., San Francisco, California, Roll: 79, Film: 1254079, Page: 170B.

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¹⁹ Pacific Mining News, p. 222.

²⁰ G.A. Price Cuxson, ed., "Society of Engineers: Transactions for 1889", E. & F. N. Spon, London: 1890, p. 95.

²¹ Pacific Mining News, p. 222.

²² Oliver, p. 1.

²³ Pacific Mining News, p. 222.

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²⁵ Oliver, p. 1.

²⁶ Munro-Fraser, p. 424.

²⁷ Purcell, p. 648.

²⁸ Contra Costa County Standard, "Stege Powder Plant Blast; One Near Death", June 6, 1941, p. 1A.

²⁹ Oliver, p. 1.

³⁰ Max Wilhelm Von Bernewitz, *Cyanide Practice, 1910 – 1913*, Dewey Publishing Company: 1913, p. 327.

³¹ Oliver, p. 1.

³² Oliver, p. 2.

³³ Hulanski, p. 354.

³⁴ Halbert Powers Gillette, *Rock Excavation: Methods and Cost*, M.C. Clark, New York: 1904, x.

³⁵ Manual Eissler, *A Handbook on Modern Explosives*, Crosby, Lockwood & son, London: 1897, p. 117.

³⁶ University of California, *The University of California Chronicle*, University of California Press, January, 1917, p. 92.

³⁷ R.L. Polk & Company, *Richmond and Contra Costa County Directory, 1914 – 1915*, Oakland, California: 1915.

Page 7 of 8 *Resource Name or # (Assigned by recorder) Richmond Field Station Building 118

*Recorded by Tetra Tech

*Date January 4, 2013 Continuation Update

When Oliver died in 1918 his son Roland Oliver took over as president of California Cap Company. By 1922 Roland's brother Leslie Oliver was assistant manager of the plant and Edwin Letts Oliver was a director.³⁸ Roland Oliver substantially expanded the California Cap Company after he took over as president. During this era the plant grew to include 150 buildings and a horse-drawn tram line.³⁹

During the late nineteenth and early twentieth century the California Cap Company was one of the most important local employers.⁴⁰ As the twentieth century progressed more heavy industry came to Contra Costa County, and by 1940 the county was second only to Los Angeles in overall industrial production.⁴¹ The nineteenth-century California Cap Company was dwarfed by the scale of some of the newer enterprises, and its physical plant and technology were aging. During World War II California Cap was able to stay open by producing delayed action incendiary bombs that were used against Japan.⁴² The California Cap Company could not survive the transition to a peacetime economy, however, and by 1949 the plant was closed and the Oliver family looking for a buyer.

University Research/Richmond Field Station

After World War II UC Berkeley's Engineering Department needed an off-campus location in order to perform experiments that required more space than a laboratory. Department Chair Morrrough P. O' Brien and others in the department were performing experiments with sewage, sea water, and other materials unsuited to use on a crowded campus. They also wanted a location that was not too remote. The University purchased the California Cap Company from the Oliver family for the use of the Engineering Department in 1950.⁴³

The Richmond Field Station has been the location of a research overseen by numerous UC Berkeley departments over the years. The Sanitary Engineering Research Laboratory (SERL) was one of the first departments to undertake research at the site. SERL focused primarily on sewage treatment technology, and also researched pollution control and disposal of solid and liquid waste.⁴⁴ Other early projects at the field station included sea water distillation, heat transfer, and cyclic stress research.⁴⁵

At first the Department of Engineering utilized the buildings left behind by the California Cap Company. The Department established a machine shop, computer shop, receiving facility, mail service, and other facilities in addition to laboratories in the old detonator company buildings.⁴⁶ The current Buildings 102, 110, 118, 128, 150, 152 175, and 176 all date to the cap company era and have been repurposed for the Richmond Field Station. They also constructed new buildings as funds became available, and by the mid-1950s five new buildings had been

³⁸ Pacific Mining News, p.222.

³⁹ University of California, Berkeley, *Current Conditions Report*, Prepared by Tetra Tech EM Inc., November 21, 2008, p. 11.

⁴⁰ Marguerite Clausen, "On the Waterfront: An Oral History of Richmond, California", Regional Oral History Office, University of California, Berkeley, 1990, p. 21.

⁴¹ Purcell, p. 649.

⁴² Oliver, p. 1.

⁴³ P.H. McGauhey, "The Sanitary Engineering Research Laboratory: Administration, Research and Consultation, 1950-1975 – An Interview Conducted by Malca Call", Regional Oral History Office, University of California, Berkeley, 1974, p. 70.

⁴⁴ University of California, Berkeley, 2008, p. 13.

⁴⁵ University of California, Berkeley, Department of Engineering, "Richmond Field Station Open House", May 28, 1952, p. 3 – 4.

⁴⁶ McGauhey, p. 71.

Page 8 of 8 *Resource Name or # (Assigned by recorder) Richmond Field Station Building 118
*Recorded by Tetra Tech *Date January 4, 2013 Continuation Update

completed at the Richmond Field Station.⁴⁷ By the 1970s the department had conducted many experiments at the Richmond Field Station that could not have been performed on the main campus.

Evaluation

The following provides an evaluation of Building 118 under each NRHP/CRHR criteria.

Building 118 does not appear to meet the criteria for listing in NRHP/CRHR because it lacks historical significance. The structure has served various functions throughout its lifetime and as such lacks the strength of association necessary to be considered historically significant in relation to any particular events or persons (Criteria A/1 and B/2).

The utilitarian building lacks any identifiable architectural stylistic design and does not embody distinctive architectural or engineering qualities of type, period, or method of construction (Criterion C/3). In rare instances, buildings themselves can serve as sources of important information, however this building is not a principal source of important information in this regard (Criterion D/4).

⁴⁷ University of California, Berkeley, Department of Engineering, "Guide for Engineering Field Station Inspection", undated, p. 3.

State of California – The Resources Agency
DEPARTMENT OF PARKS AND RECREATION
PRIMARY RECORD

Primary # _____
HRI # _____
Trinomial _____
NRHP Status Code _____

Other Listings _____
Review Code _____ Reviewer _____ Date _____

Page 1 of 8

*Resource Name or # (Assigned by recorder) Richmond Field Station Building 120

P1. Other Identifier: Richmond Field Station Building 120

***P2. Location:** Not for Publication Unrestricted

***a. County** Contra Costa

and (P2b and P2c or P2d. Attach a Location Map as necessary.)

***b. USGS 7.5' Quad** Richmond **Date** 1984 **T** _____; **R** _____; $\frac{1}{4}$ of **Sec** _____; Diablo **B.M.**

c. Address _____ City _____ Zip _____

d. UTM: (give more than one for large and/or linear resources) Zone 10; 558606 mE/ 4196431 mN

e. Other Locational Data: (e.g., parcel #, directions to resource, elevation, etc., as appropriate)

***P3a. Description:** (Describe resource and its major elements. Include design, materials, condition, alterations, size, setting, and boundaries)

Building 120 is along the southeastern border of the Richmond Field Station. It is set back from Egret Way adjacent to building 117. The utilitarian building does not express any architectural style. It is 269 square feet and was constructed in 1967. It is single story and rectangular in plan. The building is topped with a shed roof. The walls and roof are corrugated metal, and the building lacks fenestration. The only entrances to the building are large openings on its northeast elevation that are covered with a metal construction fence.

***P3b. Resource Attributes:** (List attributes and codes) HP4: Ancillary Building

***P4. Resources Present:** Building Structure Object Site District Element of District Other (Isolates, etc.)



P5b. Description of Photo: (View, date, accession #) Photograph 1: Northeast and northwest facades of building, camera facing east, January 4, 2013.

***P6. Date Constructed/Age and Sources:**

Historic Prehistoric Both

1967/UC Berkeley records

***P7. Owner and Address:**

U.C. Berkeley

1301 South 46th Street

Richmond, California 94804

***P8. Recorded by:** (Name, affiliation, address)

Kara Brunzell & Julia Mates

Tetra Tech

1999 Harrison Street, Ste 500

Oakland, CA 94612

***P9. Date Recorded:** January 4, 2013

***P10. Survey Type:** (Describe) Intensive

***P11. Report Citation:** (Cite survey report and other sources, or enter "none.") Historic

Properties Survey Report for Portions of the Richmond Field Station prepared by Tetra Tech, Inc. 2013.

***Attachments:** NONE Location Map Sketch Map Continuation Sheet Building, Structure, and Object Record Archaeological Record

District Record Linear Feature Record Milling Station Record Rock Art Record Artifact Record Photograph Record

Other (list) _____

*Resource Name or # (Assigned by recorder) Richmond Field Station Building 120

B1. Historic Name: _____

B2. Common Name: Building 120

B3. Original Use: Unknown B4. Present Use: Storage

*B5. Architectural Style: Vernacular

*B6. Construction History: (Construction date, alteration, and date of alterations) Constructed in 1967

*B7. Moved? No Yes Unknown Date: circa 1990 Original Location: Unknown

*B8. Related Features: _____

B9. Architect: Unknown b. Builder: Unknown

*B10. Significance: Theme N/A Area N/A

Period of Significance N/A Property Type N/A Applicable Criteria N/A

(Discuss importance in terms of historical or architectural context as defined by theme, period, and geographic scope. Also address integrity.)

Building 120 at Richmond Field Station does not appear to meet the criteria for listing in the National Register of Historic Places (NRHP). Furthermore, the building has been evaluated in accordance with Section 15064.5(a)(2)-(3) of the CEQA Guidelines, using the criteria outlined in Section 5024.1 of the California Public Resources Code, and does not appear to meet the significance criteria as outlined in these guidelines. Therefore, the building is not eligible for listing in the California Register of Historical Resources (CRHR). (See Continuation Sheet.)

B11. Additional Resource Attributes: (List attributes and codes)

*B12. References: See Footnotes

B13. Remarks:

*B14. Evaluator: Kara Brunzell

*Date of Evaluation: January 2013

(This space reserved for official comments.)



Page 3 of 8 *Resource Name or # (Assigned by recorder) Richmond Field Station Building 120

*Recorded by Tetra Tech

*Date January 4, 2013 Continuation Update

P3a. Description (continued)

This building was constructed in 1967. During the 1960s and 1970s an incinerator burned garbage at this location.¹ Aerial photographs show that Building 120 was moved to its present location circa 1990. Research failed to reveal the building's original location. It was used as a solvent storage shed in the 1990s. Currently, drums containing waste petroleum products are stored in the building.²

B10. Significance (continued)

Historic Context

Europeans arrived in what would become Contra Costa County in 1772, when a Spanish expedition led by Pedro Fages discovered the San Pablo Bay and the confluence of the Sacramento and San Joaquin rivers.³ Though subsequent Spanish expeditions passed through the region the Spanish do not appear to have settled in the area during the mission period. In the 1820s and 1830s the Mexican government began granting large tracts of land in the area to its citizens, including Ranchos San Pablo, San Ramon, and Pinole. The first permanent non-native settlers were Francisco Castro and his wife Maria Gabriela Berryessa. The Mexican government granted the 18,000 acre Rancho San Pablo to the Castros in 1823.⁴ Americans began farming in Contra Costa County in the late 1830s, and by 1882 2/3 of the cultivated land in the county was devoted to wheat production.⁵

Minna C. C. Quilfelt (or Quilfeldt) purchased 600 acres of Rancho San Pablo in 1852 and 1853.⁶ Adjacent to San Francisco Bay in what would eventually become the southern portion of the City of Richmond, a wharf and produce warehouse were constructed on the ranch in the 1860s to ship agricultural produce to the San Francisco markets from Rancho San Pablo as well as the Quilfelt ranch. The warehouse and wharf were used to transport cattle, grain, fruit, and in later years the frogs' legs raised by Richard Stege for the San Francisco restaurant market.⁷ German native Richard Stege settled on Rancho San Pablo in the late 1860s after stints in the gold fields and the Siberian fur trade. He married Minna Quilfelt, who was a widow, in 1870.⁸ Minna Quilfelt Stege died in 1879, leaving the ranch to Stege and her daughter Edith. Stege began selling off portions of his ranch to raise money while continuing his frog-raising and other ventures. A town named Stege formed on Richard Stege's holdings, and by the late nineteenth century several industries, including the California Cap Works, the United States Briquette Company, the Stauffer Chemical Works and the Stege Lumber Manufacturing Company, were operating from portions of the Stege Ranch.⁹ Richmond incorporated in 1905, and by 1917 was already the largest city in Contra Costa County.¹⁰ Stege was eventually absorbed into Richmond as the latter grew.

¹ Shackleton, 2013.

² University of California, Berkeley, 2008, p. 28.

³ Mildred B. Hoover, Hero E. Rensch, Ethel G. Rensch, Douglas E. Kyle, *Historic Spots in California, Fourth Edition*, Stanford University Press, Stanford, California: 1958, p. 129.

⁴ Donald Bastin, *Images of America: Richmond*, Arcadia Publishing, Charleston SC: 2003, p. 9.

⁵ J.P. Munro-Fraser, *History of Contra Costa County, California*, W.A. Slocum & Co., San Francisco: 1882, p. 55 – 57.

⁶ Evan Griffins, "Early History of Richmond", December 1938, El Cerrito Historical Society, website: <http://www.elcerritowire.com/history/pages/EarlyRichmond.htm>, accessed January 2013.

⁷ Roland Oliver, "Recollections of Early Industries in Stege", August 7, 1959, p. 1.

⁸ J.P. Munro-Fraser, p. 675.

⁹ Frederick J. Hulaniski, *The History of Contra Costa County, California*. Elms Publishing Company, Berkeley, California: 1917, p. 354.

¹⁰ Hulaniski p. 288.

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*Recorded by Tetra Tech

*Date January 4, 2013 Continuation Update

The Explosives Industry in Contra Costa County

Swedish chemist Alfred Nobel laid the foundation for the high-explosives industry with his innovations beginning in 1860s, inventing first a detonator and then a blasting cap. In 1867 he invented dynamite, which was safer, cheaper, and more powerful than nitroglycerine, which had been the most commonly used explosive. Nobel licensed the Giant Powder Company to produce dynamite in California later that year. Giant was the first American company to produce dynamite, and its plant was initially located in Rock House Canyon, in what is today the City of San Francisco. The California Powder Works began manufacturing dynamite in the same area in 1869.¹¹

The nineteenth century explosives industry was extremely dangerous, and as San Francisco's population grew explosives manufacturers needed to relocate. Contra Costa County across the bay was attractive since it was accessible due to its proximity to the harbor yet remote from population centers. In addition, the narrow canyons of Contra Costa County, which terminate in small bays, provided a natural geographical defense against explosions by allowing factory design that placed water between different facets of explosives manufacturing.¹²

During the 1870s chemical and explosives manufacturers began opening in the vicinity of what would eventually become Richmond. The Tonite Powder Company, Western Mineral Company, and California Cap Company were established at 1877 on the Stege ranch. The San Francisco explosives companies soon followed those explosive companies across the bay to Contra Costa County. In 1880, Giant relocated to Point Pinole, changing its name to the Atlas Powder Company. The California Powder Works soon followed, building a new factory in Hercules, which was named for the brand under which the company sold its powder.¹³ The Vulcan Powder Works and Judson Powder works also opened in the Stege Ranch area during this era, consolidating Contra Costa County's position as the cradle of the California explosives industry. The East Bay dominated California explosives manufacturing into the twentieth century. In 1902 California had only one powder factory outside Contra Costa and Alameda counties.¹⁴

William Letts Oliver

William Letts Oliver was born in Chile to English parents in 1844. He attended the University of Edinburgh and became a mining engineer. After returning to Chile, Oliver ran an explosives factory, which was nationalized by the Chilean government in 1864. After the loss of his factory, Oliver left Chile for San Francisco.¹⁵ William Letts Oliver and his wife Carrie lived in Oakland, from about 1880 until Oliver's death in 1918.¹⁶ The couple eventually had six children together: Roland, Edwin, Caroline, Anita, William Harold, and Albert.¹⁷ In addition his various professional activities William Letts Oliver was a yachtsman and an officer of the Bohemian Grove club in the

¹¹ Ida Mae Purcell, *History of Contra Costa County*, The Gillick Press, Berkeley, California" 1940, p. 645 – 646.

¹² James E. Vance, *Geography and Urban Evolution in the San Francisco Bay Area*, University of California, Berkeley: 1964, p. 27.

¹³ Purcell, p. 646.

¹⁴ Richmond Record, "Contra Costa County: Under the Vitascope", Richmond:1902.

¹⁵ Pacific Mining News, Supplement to Engineering & Mining Journal-Press, "Industrial Notes: Developing of the Blasting Cap Industry", Vol. 1, No. 7, November 1922, p. 222.

¹⁶ United States Census Bureau, Tenth Census of the United States, 1880, National Archives and Records Administration, Washington, D.C., San Francisco, California, Roll: 79, Film: 1254079, Page: 170B.

¹⁷ United States Census Bureau, Twelfth Census of the United States, 1900, National Archives and Records Administration, Washington, D.C., Oakland Ward 3, Alameda, California, Roll: 82, Page: 13A.

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*Recorded by Tetra Tech

*Date January 4, 2013 Continuation Update

early twentieth century. An avid amateur photographer throughout his lifetime, UC Berkeley's Bancroft Library has a collection of 2700 negatives and prints taken by Oliver and his son.¹⁸

William Letts Oliver initially gained familiarity with an explosive called guncotton while manufacturing collodion for his photography hobby.¹⁹ As early as 1870, European explosive companies were experimenting with nitrated guncotton in and by 1875 it was manufactured in England under the name "tonite."²⁰ By 1877 Oliver had left Chile and was mining in the western United States. Engineers working on the Sutro Tunnel in the Comstock needed an explosive that would remain stable at the high temperatures underground to complete the tunnel, and Oliver was able to solve the problem by substituting tonite for more volatile compounds.²¹

The California Cap Company

In 1877 William Letts Oliver was inspired by his success with tonite to leave mining and establish the Tonite Powder Company, on a portion of the former Stege Ranch.²² In the 1870s all blasting caps in the United States had to be imported from Europe. Not only were they expensive, but the timing of deliveries was uncertain, creating business difficulties for the powder plant. Oliver was determined to create his own caps in order to protect the tonite factory business. He experimented until he came up with a blasting cap that was safer to use and had better detonating qualities than imported detonators. Oliver and his partner Freeborn Fletter founded the California Cap Company. It was located adjacent to the Tonite Powder Company a 160 acre parcel carved out of the southern portion of Stege Ranch.²³ California Cap Company, which went on to operate on the site for nearly seven decades, was the first manufacturer of blasting caps in the United States. Richard Stege, meanwhile, continued to reside on the ranch, and contracted with Tonite Powder and California Cap to transport their products to the railroad.²⁴ The California Cap Company was located on the parcel that is currently the Richmond Field Station. The Tonite Powder Company appears to have been located to the east on the parcel that became the Stauffer Chemical Company and later the Zeneca site, although its exact location is unclear.

The Tonite and California Cap factories, which were the first of several gunpowder and chemical companies in the region, were separated by the Stege agricultural warehouse for safety.²⁵ The explosives industry during this era was an extremely dangerous one. A horrific explosion in 1882 at the nearby Vulcan Powder Company caused 11 deaths and destroyed the plant.²⁶ Between 1882 and 1918 the Hercules and Atlas plants suffered numerous explosions which destroyed plant buildings and killed a total of 64 workers.²⁷ Despite its focus on safety, the California Cap Company had accidents as well. Two of its Chinese workers were killed in 1917 when one of them dropped a tray of caps. In 1941 an explosion caused a fire and critically injured a worker.²⁸

¹⁸ Online Archive of California, "Guide to the Oliver Family Photograph Collection", UC Berkeley: 2009, website: <http://www.oac.cdlib.org/findaid/ark:/13030/ft0q2n99r1/> accessed February, 2013.

¹⁹ Pacific Mining News, p. 222.

²⁰ G.A. Price Cuxson, ed., "Society of Engineers: Transactions for 1889", E. & F. N. Spon, London: 1890, p. 95.

²¹ Pacific Mining News, p. 222.

²² Oliver, p. 1.

²³ Pacific Mining News, p. 222.

²⁴ Nilda Rego, "Enterprising Stege lost all and died without a penny", Time Out, March 27, 1994, p. 2, column 4.

²⁵ Oliver, p. 1.

²⁶ Munro-Fraser, p. 424.

²⁷ Purcell, p. 648.

²⁸ Contra Costa County Standard, "Stege Powder Plant Blast; One Near Death", June 6, 1941, p. 1A.

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*Recorded by Tetra Tech

*Date January 4, 2013 Continuation Update

William Letts Oliver continued to innovate throughout his long career in the chemical and explosives industries. In 1888 he formed the American Lucol Company adjacent to the California Cap Company property.²⁹ The Lucol plant was at what is currently the southeastern corner of the Richmond Field Station, at the approximate location of Building 163. Lucol manufactured a linseed oil substitute.³⁰ The factory was dismantled and relocated to New Jersey circa 1900.³¹ In 1903 the Hotaling Briquette Works opened on Lucol's site at the southeast corner of the current Richmond Field station property.³² Later known as the U.S. Briquette Company, the plant appears to have operated at this location until at least 1917.³³ The U.S. Briquette Company buildings were demolished sometime in the 1960s.

The Oliver family aggressively promoted their products both through advertising and publishing. The California Cap Company sponsored or published both articles and book-length treatises on the use of explosives. Safety was a key element of the company image, a topic of company-sponsored technical writing as well as a selling point in advertisements.³⁴ The Tonite Powder Company's product was known even outside the United States, and by the end of the nineteenth century the powder's explosive properties were considered comparable to the finest English products.³⁵ Oliver's sons Roland and Edwin Letts Oliver both graduated from UC Berkeley's College of Mining in 1900. Roland Oliver seems to have spent his entire career working in the family enterprises, while Edwin worked at California Cap between mining and other ventures. The Oliver family also became benefactors of the university, and in 1917 the California Cap Company donated substantial amounts of their products to the College of Mining including 500 electric detonators, 500 delayed action exploders, and 500 blasting caps.³⁶

Eventually the Tonite factory appears to have been incorporated into the California Cap Company. The Olivers also formed an entity named Pacific Cartridge Company circa 1910. The Pacific Cartridge Company operated from the California Cap plant during World War I.³⁷ By 1916 there were at least a dozen buildings on the site. When Oliver died in 1918 his son Roland Oliver took over as president of California Cap Company. By 1922 Roland's brother Leslie Oliver was assistant manager of the plant and Edwin Letts Oliver was a director.³⁸ Roland Oliver substantially expanded the California Cap Company after he took over as president. During this era the plant grew to include 150 buildings and a horse-drawn tram line.³⁹

During the late nineteenth and early twentieth century the California Cap Company was one of the most important local employers.⁴⁰ As the twentieth century progressed more heavy industry came to Contra Costa County, and by

²⁹ Oliver, p. 1.

³⁰ Max Wilhelm Von Bernewitz, *Cyanide Practice, 1910 – 1913*, Dewey Publishing Company: 1913, p. 327.

³¹ Oliver, p. 1.

³² Oliver, p. 2.

³³ Hulanksi, p. 354.

³⁴ Halbert Powers Gillette, *Rock Excavation: Methods and Cost*, M.C. Clark, New York: 1904, x.

³⁵ Manual Eissler, *A Handbook on Modern Explosives*, Crosby, Lockwood & son, London: 1897, p. 117.

³⁶ University of California, *The University of California Chronicle*, University of California Press, January, 1917, p. 92.

³⁷ R.L. Polk & Company, *Richmond and Contra Costa County Directory, 1914 – 1915*, Oakland, California: 1915.

³⁸ Pacific Mining News, p.222.

³⁹ University of California, Berkeley, *Current Conditions Report*, Prepared by Tetra Tech EM Inc., November 21, 2008, p. 11.

⁴⁰ Marguerite Clausen, "On the Waterfront: An Oral History of Richmond, California", Regional Oral History Office, University of California, Berkeley, 1990, p. 21.

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*Recorded by Tetra Tech

*Date January 4, 2013 Continuation Update

1940 the county was second only to Los Angeles in overall industrial production.⁴¹ The nineteenth-century California Cap Company was dwarfed by the scale of some of the newer enterprises, and its physical plant and technology were aging. During World War II California Cap was able to stay open by producing delayed action incendiary bombs that were used against Japan.⁴² The California Cap Company could not survive the transition to a peacetime economy, however, and by 1949 the plant was closed and the Oliver family looking for a buyer.

University Research/Richmond Field Station

After World War II UC Berkeley's Engineering Department needed an off-campus location in order to perform experiments that required more space than a laboratory. Department Chair Morrrough P. O' Brien and others in the department were performing experiments with sewage, sea water, and other materials unsuited to use on a crowded campus. They also wanted a location that was not too remote. The University purchased the California Cap Company from the Oliver family for the use of the Engineering Department in 1950.⁴³

The Richmond Field Station has been the location of a research overseen by numerous UC Berkeley departments over the years. The Sanitary Engineering Research Laboratory (SERL) was one of the first departments to undertake research at the site. SERL focused primarily on sewage treatment technology, and also researched pollution control and disposal of solid and liquid waste.⁴⁴ Other early projects at the field station included sea water distillation, heat transfer, and cyclic stress research.⁴⁵

At first the Department of Engineering utilized the buildings left behind by the California Cap Company. The Department established a machine shop, computer shop, receiving facility, mail service, and other facilities in addition to laboratories in the old detonator company buildings.⁴⁶ The current Buildings 102, 110, 118, 128, 150, 152 175, and 176 all date to the cap company era and have been repurposed for the Richmond Field Station. They also constructed new buildings as funds became available, and by the mid-1950s five new buildings had been completed at the Richmond Field Station.⁴⁷ By the 1970s the department had conducted many experiments at the Richmond Field Station that could not have been performed on the main campus.

Evaluation

The following provides an evaluation of Building 120 under each NRHP/CRHR criteria.

Building 120 does not appear to meet the criteria for listing in NRHP/CRHR because it lacks historical significance. The structure has been used for storage throughout its lifetime and as such lacks the strength of association necessary to be considered historically significant in relation to any particular events or persons (Criteria A/1 and B/2).

⁴¹ Purcell, p. 649.

⁴² Oliver, p. 1.

⁴³ P.H. McGauhey, "The Sanitary Engineering Research Laboratory: Administration, Research and Consultation, 1950-1975 – An Interview Conducted by Malca Call", Regional Oral History Office, University of California, Berkeley, 1974, p. 70.

⁴⁴ University of California, Berkeley, 2008, p. 13.

⁴⁵ University of California, Berkeley, Department of Engineering, "Richmond Field Station Open House", May 28, 1952, p. 3 – 4.

⁴⁶ McGauhey, p. 71.

⁴⁷ University of California, Berkeley, Department of Engineering, "Guide for Engineering Field Station Inspection", undated, p. 3.

Page 8 of 8 *Resource Name or # (Assigned by recorder) Richmond Field Station Building 120
*Recorded by Tetra Tech *Date January 4, 2013 Continuation Update

The utilitarian building lacks any identifiable architectural stylistic design and does not embody distinctive architectural or engineering qualities of type, period, or method of construction (Criterion C/3). In rare instances, buildings themselves can serve as sources of important information, however this building is not a principal source of important information in this regard (Criterion D/4).

State of California – The Resources Agency
DEPARTMENT OF PARKS AND RECREATION
PRIMARY RECORD

Primary # _____
HRI # _____
Trinomial _____
NRHP Status Code _____

Other Listings _____
Review Code _____ Reviewer _____ Date _____

Page 1 of 7

*Resource Name or # (Assigned by recorder) Richmond Field Station Building 121

P1. Other Identifier: Richmond Field Station Building 121

*P2. Location: Not for Publication Unrestricted

*a. County Contra Costa

and (P2b and P2c or P2d. Attach a Location Map as necessary.)

*b. USGS 7.5' Quad Richmond Date 1984 T _____; R _____; ¼ of Sec _____; Diablo B.M.

c. Address _____ City _____ Zip _____

d. UTM: (give more than one for large and/or linear resources) Zone 10; 558484 mE/ 4196446 mN

e. Other Locational Data: (e.g., parcel #, directions to resource, elevation, etc., as appropriate)

*P3a. Description: (Describe resource and its major elements. Include design, materials, condition, alterations, size, setting, and boundaries)

Building 121 is in the southern portion of the Richmond Field Station. The utilitarian building does not express any architectural style. It is 728 square feet and was constructed in 1982. It is single story and rectangular in plan. The building is topped with a front gabled roof, with exposed rafter tails at the eaves. The walls and roof are corrugated metal. It lacks fenestration. The only opening is a roll up garage door on the northeast elevation. Building 121 was constructed circa 1970, as shown by aerial photographs. It was constructed as a garage for the storage of lawn equipment. The roll up garage door was added at an unknown date. The UC Berkeley Solar Powered Vehicle Club began using it for storage circa 2009.

*P3b. Resource Attributes: (List attributes and codes) HP4: Ancillary Building

*P4. Resources Present: Building Structure Object Site District Element of District Other (Isolates, etc.)



P5b. Description of Photo: (View, date, accession #) Photograph 1: Northeast and northwest facades of building, camera facing southwest, January 4, 2013.

*P6. Date Constructed/Age and Sources:

Historic Prehistoric Both

Circa 1970/Aerial photographs

*P7. Owner and Address:

U.C. Berkeley

1301 South 46th Street

Richmond, California 94804

*P8. Recorded by: (Name, affiliation, address)

Kara Brunzell & Julia Mates

Tetra Tech

1999 Harrison Street, Ste 500

Oakland, CA 94612

*P9. Date Recorded: January 4, 2013

*P10. Survey Type: (Describe) Intensive

*P11. Report Citation: (Cite survey report and other sources, or enter "none.") Historic Properties Survey Report for Portions of the Richmond Field Station prepared by Tetra Tech, Inc. 2013.

*Attachments: NONE Location Map Sketch Map Continuation Sheet Building, Structure, and Object Record Archaeological Record District Record Linear Feature Record Milling Station Record Rock Art Record Artifact Record Photograph Record Other (list) _____

DPR 523A (1/95)

*Required Information

Page 2 of 7

*NRHP Status Code 6Z

*Resource Name or # (Assigned by recorder) Richmond Field Station Building 121

B1. Historic Name: _____

B2. Common Name: Building 121

B3. Original Use: Storage B4. Present Use: Storage

*B5. Architectural Style: Vernacular

*B6. Construction History: (Construction date, alteration, and date of alterations) Constructed circa 1970

*B7. Moved? No Yes Unknown Date: _____ Original Location: _____

*B8. Related Features: _____

B9. Architect: Unknown b. Builder: Unknown

*B10. Significance: Theme N/A Area N/A

Period of Significance N/A Property Type N/A Applicable Criteria N/A

(Discuss importance in terms of historical or architectural context as defined by theme, period, and geographic scope. Also address integrity.)

Building 121 at Richmond Field Station does not appear to meet the criteria for listing in the National Register of Historic Places (NRHP). Furthermore, the building has been evaluated in accordance with Section 15064.5(a)(2)-(3) of the CEQA Guidelines, using the criteria outlined in Section 5024.1 of the California Public Resources Code, and does not appear to meet the significance criteria as outlined in these guidelines. Therefore, the building is not eligible for listing in the California Register of Historical Resources (CRHR). (See Continuation Sheet.)

B11. Additional Resource Attributes: (List attributes and codes)

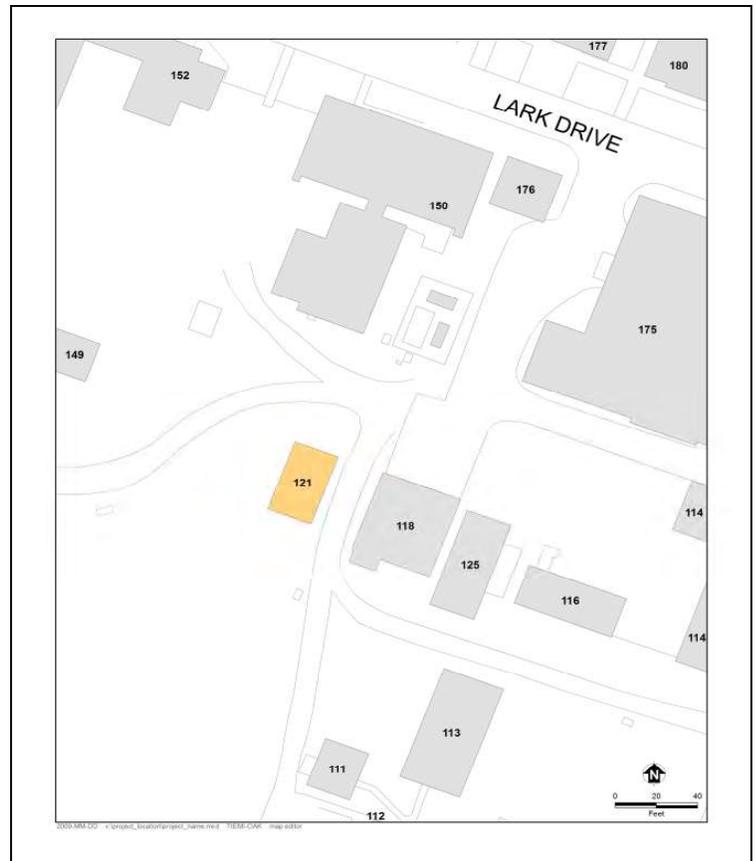
*B12. References: See Footnotes

B13. Remarks:

*B14. Evaluator: Kara Brunzell

*Date of Evaluation: January 2013

(This space reserved for official comments.)



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*Recorded by Tetra Tech

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B10. Significance (continued)

Historic Context

Europeans arrived in what would become Contra Costa County in 1772, when a Spanish expedition led by Pedro Fages discovered the San Pablo Bay and the confluence of the Sacramento and San Joaquin rivers.¹ Though subsequent Spanish expeditions passed through the region the Spanish do not appear to have settled in the area during the mission period. In the 1820s and 1830s the Mexican government began granting large tracts of land in the area to its citizens, including Ranchos San Pablo, San Ramon, and Pinole. The first permanent non-native settlers were Francisco Castro and his wife Maria Gabriela Berryessa. The Mexican government granted the 18,000 acre Rancho San Pablo to the Castros in 1823.² Americans began farming in Contra Costa County in the late 1830s, and by 1882 2/3 of the cultivated land in the county was devoted to wheat production.³

Minna C. C. Quilfelt (or Quilfeldt) purchased 600 acres of Rancho San Pablo in 1852 and 1853.⁴ Adjacent to San Francisco Bay in what would eventually become the southern portion of the City of Richmond, a wharf and produce warehouse were constructed on the ranch in the 1860s to ship agricultural produce to the San Francisco markets from Rancho San Pablo as well as the Quilfelt ranch. The warehouse and wharf were used to transport cattle, grain, fruit, and in later years the frogs' legs raised by Richard Stege for the San Francisco restaurant market.⁵ German native Richard Stege settled on Rancho San Pablo in the late 1860s after stints in the gold fields and the Siberian fur trade. He married Minna Quilfelt, who was a widow, in 1870.⁶ Minna Quilfelt Stege died in 1879, leaving the ranch to Stege and her daughter Edith. Stege began selling off portions of his ranch to raise money while continuing his frog-raising and other ventures. A town named Stege formed on Richard Stege's holdings, and by the late nineteenth century several industries, including the California Cap Works, the United States Briquette Company, the Stauffer Chemical Works and the Stege Lumber Manufacturing Company, were operating from portions of the Stege Ranch.⁷ Richmond incorporated in 1905, and by 1917 was already the largest city in Contra Costa County.⁸ Stege was eventually absorbed into Richmond as the latter grew.

The Explosives Industry in Contra Costa County

Swedish chemist Alfred Nobel laid the foundation for the high-explosives industry with his innovations beginning in 1860s, inventing first a detonator and then a blasting cap. In 1867 he invented dynamite, which was safer, cheaper, and more powerful than nitroglycerine, which had been the most commonly used explosive. Nobel licensed the Giant Powder Company to produce dynamite in California later that year. Giant was the first American company to produce dynamite, and its plant was initially located in Rock House Canyon, in what is today the City of San Francisco. The California Powder Works began manufacturing dynamite in the same area in 1869.⁹

¹ Mildred B. Hoover, Hero E. Rensch, Ethel G. Rensch, Douglas E. Kyle, *Historic Spots in California, Fourth Edition*, Stanford University Press, Stanford, California: 1958, p. 129.

² Donald Bastin, *Images of America: Richmond*, Arcadia Publishing, Charleston SC: 2003, p. 9.

³ J.P. Munro-Fraser, *History of Contra Costa County, California*, W.A. Slocum & Co., San Francisco: 1882, p. 55 – 57.

⁴ Evan Griffins, "Early History of Richmond", December 1938, El Cerrito Historical Society, website: <http://www.elcerritowire.com/history/pages/EarlyRichmond.htm>, accessed January 2013.

⁵ Roland Oliver, "Recollections of Early Industries in Stege", August 7, 1959, p. 1.

⁶ J.P. Munro-Fraser, p. 675.

⁷ Frederick J. Hulaniski, *The History of Contra Costa County, California*. Elms Publishing Company, Berkeley, California: 1917, p. 354.

⁸ Hulaniski p. 288.

⁹ Ida Mae Purcell, *History of Contra Costa County*, The Gillick Press, Berkeley, California" 1940, p. 645 – 646.

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The nineteenth century explosives industry was extremely dangerous, and as San Francisco's population grew explosives manufacturers needed to relocate. Contra Costa County across the bay was attractive since it was accessible due to its proximity to the harbor yet remote from population centers. In addition, the narrow canyons of Contra Costa County, which terminate in small bays, provided a natural geographical defense against explosions by allowing factory design that placed water between different facets of explosives manufacturing.¹⁰

During the 1870s chemical and explosives manufacturers began opening in the vicinity of what would eventually become Richmond. The Tonite Powder Company, Western Mineral Company, and California Cap Company were established at 1877 on the Stege ranch. The San Francisco explosives companies soon followed those explosive companies across the bay to Contra Costa County. In 1880, Giant relocated to Point Pinole, changing its name to the Atlas Powder Company. The California Powder Works soon followed, building a new factory in Hercules, which was named for the brand under which the company sold its powder.¹¹ The Vulcan Powder Works and Judson Powder works also opened in the Stege Ranch area during this era, consolidating Contra Costa County's position as the cradle of the California explosives industry. The East Bay dominated California explosives manufacturing into the twentieth century. In 1902 California had only one powder factory outside Contra Costa and Alameda counties.¹²

William Letts Oliver

William Letts Oliver was born in Chile to English parents in 1844. He attended the University of Edinburgh and became a mining engineer. After returning to Chile, Oliver ran an explosives factory, which was nationalized by the Chilean government in 1864. After the loss of his factory, Oliver left Chile for San Francisco.¹³ William Letts Oliver and his wife Carrie lived in Oakland, from about 1880 until Oliver's death in 1918.¹⁴ The couple eventually had six children together: Roland, Edwin, Caroline, Anita, William Harold, and Albert.¹⁵ In addition his various professional activities William Letts Oliver was a yachtsman and an officer of the Bohemian Grove club in the early twentieth century. An avid amateur photographer throughout his lifetime, UC Berkeley's Bancroft Library has a collection of 2700 negatives and prints taken by Oliver and his son.¹⁶

William Letts Oliver initially gained familiarity with an explosive called guncotton while manufacturing collodion for his photography hobby.¹⁷ As early as 1870, European explosive companies were experimenting with nitrated guncotton in and by 1875 it was manufactured in England under the name "tonite."¹⁸ By 1877 Oliver had left Chile and was mining in the western United States. Engineers working on the Sutro Tunnel in the Comstock

¹⁰ James E. Vance, *Geography and Urban Evolution in the San Francisco Bay Area*, University of California, Berkeley: 1964, p. 27.

¹¹ Purcell, p. 646.

¹² Richmond Record, "Contra Costa County: Under the Vitascope", Richmond:1902.

¹³ Pacific Mining News, Supplement to Engineering & Mining Journal-Press, "Industrial Notes: Developing of the Blasting Cap Industry", Vol. 1, No. 7, November 1922, p. 222.

¹⁴ United States Census Bureau, Tenth Census of the United States, 1880, National Archives and Records Administration, Washington, D.C., San Francisco, California, Roll: 79, Film: 1254079, Page: 170B.

¹⁵ United States Census Bureau, Twelfth Census of the United States, 1900, National Archives and Records Administration, Washington, D.C., Oakland Ward 3, Alameda, California, Roll: 82, Page: 13A.

¹⁶ Online Archive of California, "Guide to the Oliver Family Photograph Collection", UC Berkeley: 2009, website: <http://www.oac.cdlib.org/findaid/ark:/13030/ft0q2n99r1/> accessed February, 2013.

¹⁷ Pacific Mining News, p. 222.

¹⁸ G.A. Price Cuxson, ed., "Society of Engineers: Transactions for 1889", E. & F. N. Spon, London: 1890, p. 95.

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needed an explosive that would remain stable at the high temperatures underground to complete the tunnel, and Oliver was able to solve the problem by substituting tonite for more volatile compounds.¹⁹

The California Cap Company

In 1877 William Letts Oliver was inspired by his success with tonite to leave mining and establish the Tonite Powder Company, on a portion of the former Stege Ranch.²⁰ In the 1870s all blasting caps in the United States had to be imported from Europe. Not only were they expensive, but the timing of deliveries was uncertain, creating business difficulties for the powder plant. Oliver was determined to create his own caps in order to protect the tonite factory business. He experimented until he came up with a blasting cap that was safer to use and had better detonating qualities than imported detonators. Oliver and his partner Freeborn Fletter founded the California Cap Company. It was located adjacent to the Tonite Powder Company a 160 acre parcel carved out of the southern portion of Stege Ranch.²¹ California Cap Company, which went on to operate on the site for nearly seven decades, was the first manufacturer of blasting caps in the United States. Richard Stege, meanwhile, continued to reside on the ranch, and contracted with Tonite Powder and California Cap to transport their products to the railroad.²² The California Cap Company was located on the parcel that is currently the Richmond Field Station. The Tonite Powder Company appears to have been located to the east on the parcel that became the Stauffer Chemical Company and later the Zeneca site, although its exact location is unclear.

The Tonite and California Cap factories, which were the first of several gunpowder and chemical companies in the region, were separated by the Stege agricultural warehouse for safety.²³ The explosives industry during this era was an extremely dangerous one. A horrific explosion in 1882 at the nearby Vulcan Powder Company caused 11 deaths and destroyed the plant.²⁴ Between 1882 and 1918 the Hercules and Atlas plants suffered numerous explosions which destroyed plant buildings and killed a total of 64 workers.²⁵ Despite its focus on safety, the California Cap Company had accidents as well. Two of its Chinese workers were killed in 1917 when one of them dropped a tray of caps. In 1941 an explosion caused a fire and critically injured a worker.²⁶

William Letts Oliver continued to innovate throughout his long career in the chemical and explosives industries. In 1888 he formed the American Lucol Company adjacent to the California Cap Company property.²⁷ The Lucol plant was at what is currently the southeastern corner of the Richmond Field Station, at the approximate location of Building 163. Lucol manufactured a linseed oil substitute.²⁸ The factory was dismantled and relocated to New Jersey circa 1900.²⁹ In 1903 the Hotaling Briquette Works opened on Lucol's site at the southeast corner of the current Richmond Field station property.³⁰ Later known as the U.S. Briquette Company, the plant appears to have

¹⁹ Pacific Mining News, p. 222.

²⁰ Oliver, p. 1.

²¹ Pacific Mining News, p. 222.

²² Nilda Rego, "Enterprising Stege lost all and died without a penny", Time Out, March 27, 1994, p. 2, column 4.

²³ Oliver, p. 1.

²⁴ Munro-Fraser, p. 424.

²⁵ Purcell, p. 648.

²⁶ Contra Costa County Standard, "Stege Powder Plant Blast; One Near Death", June 6, 1941, p. 1A.

²⁷ Oliver, p. 1.

²⁸ Max Wilhelm Von Bernewitz, *Cyanide Practice, 1910 – 1913*, Dewey Publishing Company: 1913, p. 327.

²⁹ Oliver, p. 1.

³⁰ Oliver, p. 2.

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operated at this location until at least 1917.³¹ The U.S. Briquette Company buildings were demolished sometime in the 1960s.

The Oliver family aggressively promoted their products both through advertising and publishing. The California Cap Company sponsored or published both articles and book-length treatises on the use of explosives. Safety was a key element of the company image, a topic of company-sponsored technical writing as well as a selling point in advertisements.³² The Tonite Powder Company's product was known even outside the United States, and by the end of the nineteenth century the powder's explosive properties were considered comparable to the finest English products.³³ Oliver's sons Roland and Edwin Letts Oliver both graduated from UC Berkeley's College of Mining in 1900. Roland Oliver seems to have spent his entire career working in the family enterprises, while Edwin worked at California Cap between mining and other ventures. The Oliver family also became benefactors of the university, and in 1917 the California Cap Company donated substantial amounts of their products to the College of Mining including 500 electric detonators, 500 delayed action exploders, and 500 blasting caps.³⁴

Eventually the Tonite factory appears to have been incorporated into the California Cap Company. The Olivers also formed an entity named Pacific Cartridge Company circa 1910. The Pacific Cartridge Company operated from the California Cap plant during World War I.³⁵ By 1916 there were at least a dozen buildings on the site. When Oliver died in 1918 his son Roland Oliver took over as president of California Cap Company. By 1922 Roland's brother Leslie Oliver was assistant manager of the plant and Edwin Letts Oliver was a director.³⁶ Roland Oliver substantially expanded the California Cap Company after he took over as president. During this era the plant grew to include 150 buildings and a horse-drawn tram line.³⁷

During the late nineteenth and early twentieth century the California Cap Company was one of the most important local employers.³⁸ As the twentieth century progressed more heavy industry came to Contra Costa County, and by 1940 the county was second only to Los Angeles in overall industrial production.³⁹ The nineteenth-century California Cap Company was dwarfed by the scale of some of the newer enterprises, and its physical plant and technology were aging. During World War II California Cap was able to stay open by producing delayed action incendiary bombs that were used against Japan.⁴⁰ The California Cap Company could not survive the transition to a peacetime economy, however, and by 1949 the plant was closed and the Oliver family looking for a buyer.

University Research/Richmond Field Station

After World War II UC Berkeley's Engineering Department needed an off-campus location in order to perform experiments that required more space than a laboratory. Department Chair Morrrough P. O' Brien and others in the

³¹ Hulanksi, p. 354.

³² Halbert Powers Gillette, *Rock Excavation: Methods and Cost*, M.C. Clark, New York: 1904, x.

³³ Manual Eissler, *A Handbook on Modern Explosives*, Crosby, Lockwood & son, London: 1897, p. 117.

³⁴ University of California, *The University of California Chronicle*, University of California Press, January, 1917, p. 92.

³⁵ R.L. Polk & Company, *Richmond and Contra Costa County Directory, 1914 – 1915*, Oakland, California: 1915.

³⁶ Pacific Mining News, p.222.

³⁷ University of California, Berkeley, *Current Conditions Report*, Prepared by Tetra Tech EM Inc., November 21, 2008, p. 11.

³⁸ Marguerite Clausen, "On the Waterfront: An Oral History of Richmond, California", Regional Oral History Office, University of California, Berkeley, 1990, p. 21.

³⁹ Purcell, p. 649.

⁴⁰ Oliver, p. 1.

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department were performing experiments with sewage, sea water, and other materials unsuited to use on a crowded campus. They also wanted a location that was not too remote. The University purchased the California Cap Company from the Oliver family for the use of the Engineering Department in 1950.⁴¹

The Richmond Field Station has been the location of a research overseen by numerous UC Berkeley departments over the years. The Sanitary Engineering Research Laboratory (SERL) was one of the first departments to undertake research at the site. SERL focused primarily on sewage treatment technology, and also researched pollution control and disposal of solid and liquid waste.⁴² Other early projects at the field station included sea water distillation, heat transfer, and cyclic stress research.⁴³

At first the Department of Engineering utilized the buildings left behind by the California Cap Company. The Department established a machine shop, computer shop, receiving facility, mail service, and other facilities in addition to laboratories in the old detonator company buildings.⁴⁴ The current Buildings 102, 110, 118, 128, 150, 152 175, and 176 all date to the cap company era and have been repurposed for the Richmond Field Station. They also constructed new buildings as funds became available, and by the mid-1950s five new buildings had been completed at the Richmond Field Station.⁴⁵ By the 1970s the department had conducted many experiments at the Richmond Field Station that could not have been performed on the main campus.

Evaluation

The following provides an evaluation of Building 121 under each NRHP/CRHR criteria.

Building 121 does not appear to meet the criteria for listing in NRHP/CRHR because it lacks historical significance. The structure has been used for vehicle storage throughout its lifetime and as such lacks the strength of association necessary to be considered historically significant in relation to any particular events or persons (Criteria A/1 and B/2).

The utilitarian building lacks any identifiable architectural stylistic design and does not embody distinctive architectural or engineering qualities of type, period, or method of construction (Criterion C/3). In rare instances, buildings themselves can serve as sources of important information, however this building is not a principal source of important information in this regard (Criterion D/4).

Criterion G: As a vehicle storage facility, Building 121 does not meet the standard of exceptional importance required for properties less than 50 years old to be eligible to the NHRP.

⁴¹ P.H. McGauhey, "The Sanitary Engineering Research Laboratory: Administration, Research and Consultation, 1950-1975 – An Interview Conducted by Malca Call", Regional Oral History Office, University of California, Berkeley, 1974, p. 70.

⁴² University of California, Berkeley, 2008, p. 13.

⁴³ University of California, Berkeley, Department of Engineering, "Richmond Field Station Open House", May 28, 1952, p. 3 – 4.

⁴⁴ McGauhey, p. 71.

⁴⁵ University of California, Berkeley, Department of Engineering, "Guide for Engineering Field Station Inspection", undated, p. 3.

State of California – The Resources Agency
DEPARTMENT OF PARKS AND RECREATION
PRIMARY RECORD

Primary # _____
HRI # _____
Trinomial _____
NRHP Status Code _____

Other Listings _____
Review Code _____ Reviewer _____ Date _____

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*Resource Name or # (Assigned by recorder) Richmond Field Station Building 125

P1. Other Identifier: Richmond Field Station Building 125

*P2. Location: Not for Publication Unrestricted

*a. County Contra Costa

and (P2b and P2c or P2d. Attach a Location Map as necessary.)

*b. USGS 7.5' Quad Richmond Date 1984 T _____; R _____; ¼ of Sec _____; Diablo B.M.

c. Address _____ City _____ Zip _____

d. UTM: (give more than one for large and/or linear resources) Zone 10; 558509 mE/ 4196433 mN

e. Other Locational Data: (e.g., parcel #, directions to resource, elevation, etc., as appropriate)

*P3a. Description: (Describe resource and its major elements. Include design, materials, condition, alterations, size, setting, and boundaries)

Building 125 is in the southern portion of the Richmond Field Station. It is west of Egret Way and between to Building 116 and Building 118 with its primary façade facing northeast. The vernacular building does not express any particular architectural style. It is 1,024 square feet and was constructed prior to 1940. It is single story and rectangular in plan. (See continuation sheet)

*P3b. Resource Attributes: (List attributes and codes) HP4: Ancillary Building

*P4. Resources Present: Building Structure Object Site District Element of District Other (Isolates, etc.)



P5b. Description of Photo: (View, date, accession #) Photograph 1: Northeast and southeast facades of building, camera facing southwest, January 4, 2013.

*P6. Date Constructed/Age and Sources:
 Historic Prehistoric Both

Circa 1930s/UC Berkeley records

*P7. Owner and Address:

U.C. Berkeley

1301 South 46th Street

Richmond, California 94804

*P8. Recorded by: (Name, affiliation, address)

Kara Brunzell & Julia Mates

Tetra Tech

1999 Harrison Street, Ste 500

Oakland, CA 94612

*P9. Date Recorded: January 4, 2013

*P10. Survey Type: (Describe) Intensive

*P11. Report Citation: (Cite survey report and other sources, or enter "none.") Historic Properties Survey Report for Portions of the Richmond Field Station prepared by Tetra Tech, Inc., 2013.

*Attachments: NONE Location Map Sketch Map Continuation Sheet Building, Structure, and Object Record Archaeological Record
 District Record Linear Feature Record Milling Station Record Rock Art Record Artifact Record Photograph Record
 Other (list) _____

*Resource Name or # (Assigned by recorder) Richmond Field Station Building 125

B1. Historic Name: California Cap Company Building 24

B2. Common Name: Building 125

B3. Original Use: Storage B4. Present Use: Storage

*B5. Architectural Style: Vernacular

*B6. Construction History: (Construction date, alteration, and date of alterations) Constructed circa 1930

*B7. Moved? No Yes Unknown Date: 1998 Original Location: Building 102 area

*B8. Related Features: _____

B9. Architect: Unknown b. Builder: Unknown

*B10. Significance: Theme N/A Area N/A

Period of Significance N/A Property Type N/A Applicable Criteria N/A

(Discuss importance in terms of historical or architectural context as defined by theme, period, and geographic scope. Also address integrity.)

Building 125 at Richmond Field Station does not appear to meet the criteria for listing in the National Register of Historic Places (NRHP). Furthermore, the building has been evaluated in accordance with Section 15064.5(a)(2)-(3) of the CEQA Guidelines, using the criteria outlined in Section 5024.1 of the California Public Resources Code, and does not appear to meet the significance criteria as outlined in these guidelines. Therefore, the building is not eligible for listing in the California Register of Historical Resources (CRHR). (See Continuation Sheet.)

B11. Additional Resource Attributes: (List attributes and codes)

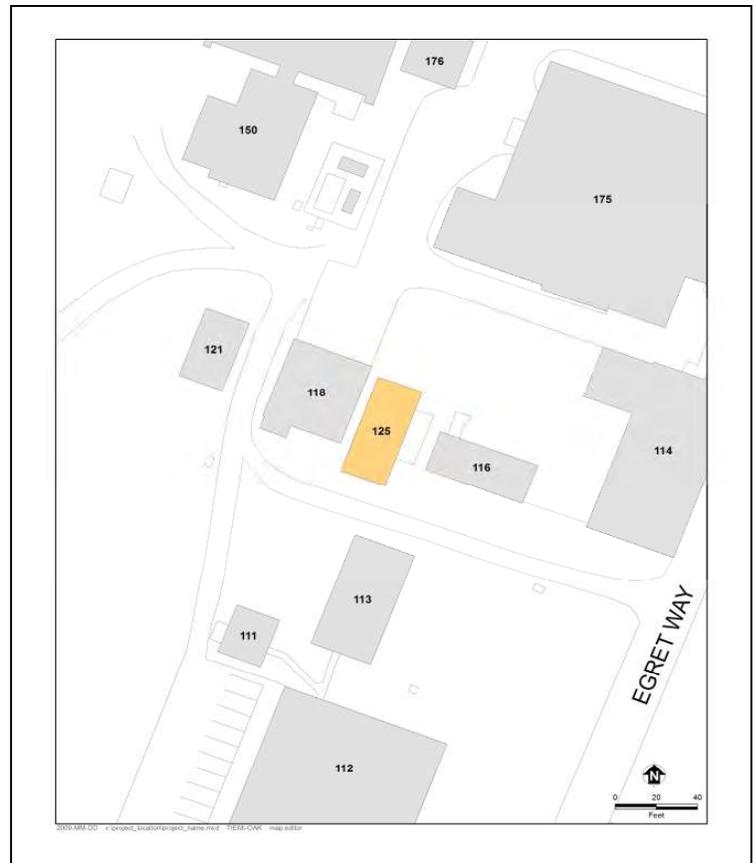
*B12. References: See Footnotes

B13. Remarks:

*B14. Evaluator: Kara Brunzell

*Date of Evaluation: January 2013

(This space reserved for official comments.)



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***P3a. Description: (continued)**

The building is topped with a front gabled roof, and purlins are exposed at the minimal eaves on the front (northeast) and rear (southwest) elevations. Both gables are adorned with simple, decorative, stickwork trusses. The walls and roof are corrugated metal. Fenestration throughout the building is multi-light, wood sashes. The wide primary entrance is fitted with a flush door and reached by a wooden ramp leading to a small deck at the front of the building. The rear (southwest) door is flush, and accessed by a set of wooden stairs.

Building 125, originally labeled “Building 24,” was constructed circa 1930 by the California Cap Company. It was adjacent to the plant’s mercury fulminate production facility (near Building 102) and was used as an alcohol warehouse. After UC Berkeley purchased the property in 1950 the building was initially used as a composting facility.¹ During the 1960s SERL used the building for a laboratory and shop. It was moved to its current location as part of an environmental remediation project in 1998. It is currently used as a bioengineering research facility.²

B10. Significance (continued)

Historic Context

Europeans arrived in what would become Contra Costa County in 1772, when a Spanish expedition led by Pedro Fages discovered the San Pablo Bay and the confluence of the Sacramento and San Joaquin rivers.³ Though subsequent Spanish expeditions passed through the region the Spanish do not appear to have settled in the area during the mission period. In the 1820s and 1830s the Mexican government began granting large tracts of land in the area to its citizens, including Ranchos San Pablo, San Ramon, and Pinole. The first permanent non-native settlers were Francisco Castro and his wife Maria Gabriela Berryessa. The Mexican government granted the 18,000 acre Rancho San Pablo to the Castros in 1823.⁴ Americans began farming in Contra Costa County in the late 1830s, and by 1882 2/3 of the cultivated land in the county was devoted to wheat production.⁵

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¹ University of California, Berkeley, 2008, p. 196.

² Shackleton, 2013.

³ Mildred B. Hoover, Hero E. Rensch, Ethel G. Rensch, Douglas E. Kyle, *Historic Spots in California, Fourth Edition*, Stanford University Press, Stanford, California: 1958, p. 129.

⁴ Donald Bastin, *Images of America: Richmond*, Arcadia Publishing, Charleston SC: 2003, p. 9.

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⁷ Roland Oliver, “Recollections of Early Industries in Stege”, August 7, 1959, p. 1.

⁸ J.P. Munro-Fraser, p. 675.

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⁹ Frederick J. Hulaniski, *The History of Contra Costa County, California*. Elms Publishing Company, Berkeley, California: 1917, p. 354.

¹⁰ Hulaniski p. 288.

¹¹ Ida Mae Purcell, *History of Contra Costa County*, The Gillick Press, Berkeley, California" 1940, p. 645 – 646.

¹² James E. Vance, *Geography and Urban Evolution in the San Francisco Bay Area*, University of California, Berkeley: 1964, p. 27.

¹³ Purcell, p. 646.

¹⁴ Richmond Record, "Contra Costa County: Under the Vitascope", Richmond:1902.

¹⁵ Pacific Mining News, Supplement to Engineering & Mining Journal-Press, "Industrial Notes: Developing of the Blasting Cap Industry", Vol. 1, No. 7, November 1922, p. 222.

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Oliver and his wife Carrie lived in Oakland, from about 1880 until Oliver's death in 1918.¹⁶ The couple eventually had six children together: Roland, Edwin, Caroline, Anita, William Harold, and Albert.¹⁷ In addition his various professional activities William Letts Oliver was a yachtsman and an officer of the Bohemian Grove club in the early twentieth century. An avid amateur photographer throughout his lifetime, UC Berkeley's Bancroft Library has a collection of 2700 negatives and prints taken by Oliver and his son.¹⁸

William Letts Oliver initially gained familiarity with an explosive called guncotton while manufacturing collodion for his photography hobby.¹⁹ As early as 1870, European explosive companies were experimenting with nitrated guncotton in and by 1875 it was manufactured in England under the name "tonite."²⁰ By 1877 Oliver had left Chile and was mining in the western United States. Engineers working on the Sutro Tunnel in the Comstock needed an explosive that would remain stable at the high temperatures underground to complete the tunnel, and Oliver was able to solve the problem by substituting tonite for more volatile compounds.²¹

The California Cap Company

In 1877 William Letts Oliver was inspired by his success with tonite to leave mining and establish the Tonite Powder Company, on a portion of the former Stege Ranch.²² In the 1870s all blasting caps in the United States had to be imported from Europe. Not only were they expensive, but the timing of deliveries was uncertain, creating business difficulties for the powder plant. Oliver was determined to create his own caps in order to protect the tonite factory business. He experimented until he came up with a blasting cap that was safer to use and had better detonating qualities than imported detonators. Oliver and his partner Freeborn Fletter founded the California Cap Company. It was located adjacent to the Tonite Powder Company a 160 acre parcel carved out of the southern portion of Stege Ranch.²³ California Cap Company, which went on to operate on the site for nearly seven decades, was the first manufacturer of blasting caps in the United States. Richard Stege, meanwhile, continued to reside on the ranch, and contracted with Tonite Powder and California Cap to transport their products to the railroad.²⁴ The California Cap Company was located on the parcel that is currently the Richmond Field Station. The Tonite Powder Company appears to have been located to the east on the parcel that became the Stauffer Chemical Company and later the Zeneca site, although its exact location is unclear.

The Tonite and California Cap factories, which were the first of several gunpowder and chemical companies in the region, were separated by the Stege agricultural warehouse for safety.²⁵ The explosives industry during this era was an extremely dangerous one. A horrific explosion in 1882 at the nearby Vulcan Powder Company caused 11

¹⁶ United States Census Bureau, Tenth Census of the United States, 1880, National Archives and Records Administration, Washington, D.C., San Francisco, California, Roll: 79, Film: 1254079, Page: 170B.

¹⁷ United States Census Bureau, Twelfth Census of the United States, 1900, National Archives and Records Administration, Washington, D.C., Oakland Ward 3, Alameda, California, Roll: 82, Page: 13A.

¹⁸ Online Archive of California, "Guide to the Oliver Family Photograph Collection", UC Berkeley: 2009, website: <http://www.oac.cdlib.org/findaid/ark:/13030/ft0q2n99r1/> accessed February, 2013.

¹⁹ Pacific Mining News, p. 222.

²⁰ G.A. Price Cuxson, ed., "Society of Engineers: Transactions for 1889", E. & F. N. Spon, London: 1890, p. 95.

²¹ Pacific Mining News, p. 222.

²² Oliver, p. 1.

²³ Pacific Mining News, p. 222.

²⁴ Nilda Rego, "Enterprising Stege lost all and died without a penny", Time Out, March 27, 1994, p. 2, column 4.

²⁵ Oliver, p. 1.

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*Recorded by Tetra Tech

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deaths and destroyed the plant.²⁶ Between 1882 and 1918 the Hercules and Atlas plants suffered numerous explosions which destroyed plant buildings and killed a total of 64 workers.²⁷ Despite its focus on safety, the California Cap Company had accidents as well. Two of its Chinese workers were killed in 1917 when one of them dropped a tray of caps. In 1941 an explosion caused a fire and critically injured a worker.²⁸

William Letts Oliver continued to innovate throughout his long career in the chemical and explosives industries. In 1888 he formed the American Lucol Company adjacent to the California Cap Company property.²⁹ The Lucol plant was at what is currently the southeastern corner of the Richmond Field Station, at the approximate location of Building 163. Lucol manufactured a linseed oil substitute.³⁰ The factory was dismantled and relocated to New Jersey circa 1900.³¹ In 1903 the Hotaling Briquette Works opened on Lucol's site at the southeast corner of the current Richmond Field station property.³² Later known as the U.S. Briquette Company, the plant appears to have operated at this location until at least 1917.³³ The U.S. Briquette Company buildings were demolished sometime in the 1960s.

The Oliver family aggressively promoted their products both through advertising and publishing. The California Cap Company sponsored or published both articles and book-length treatises on the use of explosives. Safety was a key element of the company image, a topic of company-sponsored technical writing as well as a selling point in advertisements.³⁴ The Tonite Powder Company's product was known even outside the United States, and by the end of the nineteenth century the powder's explosive properties were considered comparable to the finest English products.³⁵ Oliver's sons Roland and Edwin Letts Oliver both graduated from UC Berkeley's College of Mining in 1900. Roland Oliver seems to have spent his entire career working in the family enterprises, while Edwin worked at California Cap between mining and other ventures. The Oliver family also became benefactors of the university, and in 1917 the California Cap Company donated substantial amounts of their products to the College of Mining including 500 electric detonators, 500 delayed action exploders, and 500 blasting caps.³⁶

Eventually the Tonite factory appears to have been incorporated into the California Cap Company. The Olivers also formed an entity named Pacific Cartridge Company circa 1910. The Pacific Cartridge Company operated from the California Cap plant during World War I.³⁷ By 1916 there were at least a dozen buildings on the site. When Oliver died in 1918 his son Roland Oliver took over as president of California Cap Company. By 1922 Roland's brother Leslie Oliver was assistant manager of the plant and Edwin Letts Oliver was a director.³⁸ Roland

²⁶ Munro-Fraser, p. 424.

²⁷ Purcell, p. 648.

²⁸ Contra Costa County Standard, "Stege Powder Plant Blast; One Near Death", June 6, 1941, p. 1A.

²⁹ Oliver, p. 1.

³⁰ Max Wilhelm Von Bernewitz, *Cyanide Practice, 1910 – 1913*, Dewey Publishing Company: 1913, p. 327.

³¹ Oliver, p. 1.

³² Oliver, p. 2.

³³ Hulanksi, p. 354.

³⁴ Halbert Powers Gillette, *Rock Excavation: Methods and Cost*, M.C. Clark, New York: 1904, x.

³⁵ Manual Eissler, *A Handbook on Modern Explosives*, Crosby, Lockwood & son, London: 1897, p. 117.

³⁶ University of California, *The University of California Chronicle*, University of California Press, January, 1917, p. 92.

³⁷ R.L. Polk & Company, *Richmond and Contra Costa County Directory, 1914 – 1915*, Oakland, California: 1915.

³⁸ Pacific Mining News, p.222.

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Oliver substantially expanded the California Cap Company after he took over as president. During this era the plant grew to include 150 buildings and a horse-drawn tram line.³⁹

During the late nineteenth and early twentieth century the California Cap Company was one of the most important local employers.⁴⁰ As the twentieth century progressed more heavy industry came to Contra Costa County, and by 1940 the county was second only to Los Angeles in overall industrial production.⁴¹ The nineteenth-century California Cap Company was dwarfed by the scale of some of the newer enterprises, and its physical plant and technology were aging. During World War II California Cap was able to stay open by producing delayed action incendiary bombs that were used against Japan.⁴² The California Cap Company could not survive the transition to a peacetime economy, however, and by 1949 the plant was closed and the Oliver family looking for a buyer.

University Research/Richmond Field Station

After World War II UC Berkeley's Engineering Department needed an off-campus location in order to perform experiments that required more space than a laboratory. Department Chair Morrrough P. O' Brien and others in the department were performing experiments with sewage, sea water, and other materials unsuited to use on a crowded campus. They also wanted a location that was not too remote. The University purchased the California Cap Company from the Oliver family for the use of the Engineering Department in 1950.⁴³

The Richmond Field Station has been the location of a research overseen by numerous UC Berkeley departments over the years. The Sanitary Engineering Research Laboratory (SERL) was one of the first departments to undertake research at the site. SERL focused primarily on sewage treatment technology, and also researched pollution control and disposal of solid and liquid waste.⁴⁴ Other early projects at the field station included sea water distillation, heat transfer, and cyclic stress research.⁴⁵

At first the Department of Engineering utilized the buildings left behind by the California Cap Company. The Department established a machine shop, computer shop, receiving facility, mail service, and other facilities in addition to laboratories in the old detonator company buildings.⁴⁶ The current Buildings 102, 110, 118, 128, 150, 152 175, and 176 all date to the cap company era and have been repurposed for the Richmond Field Station. They also constructed new buildings as funds became available, and by the mid-1950s five new buildings had been completed at the Richmond Field Station.⁴⁷ By the 1970s the department had conducted many experiments at the Richmond Field Station that could not have been performed on the main campus.

³⁹ University of California, Berkeley, *Current Conditions Report*, Prepared by Tetra Tech EM Inc., November 21, 2008, p. 11.

⁴⁰ Marguerite Clausen, "On the Waterfront: An Oral History of Richmond, California", Regional Oral History Office, University of California, Berkeley, 1990, p. 21.

⁴¹ Purcell, p. 649.

⁴² Oliver, p. 1.

⁴³ P.H. McGauhey, "The Sanitary Engineering Research Laboratory: Administration, Research and Consultation, 1950-1975 – An Interview Conducted by Malca Call", Regional Oral History Office, University of California, Berkeley, 1974, p. 70.

⁴⁴ University of California, Berkeley, 2008, p. 13.

⁴⁵ University of California, Berkeley, Department of Engineering, "Richmond Field Station Open House", May 28, 1952, p. 3 – 4.

⁴⁶ McGauhey, p. 71.

⁴⁷ University of California, Berkeley, Department of Engineering, "Guide for Engineering Field Station Inspection", undated, p. 3.

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Evaluation

The following provides an evaluation of Building 125 under each NRHP/CRHR criteria.

No particular association was found between the Building 125 and events significant to national, state, or local history (Criterion A/1) Although the California Cap Company was the first blasting cap manufacturer in the United States there is no indication that Building 125, a warehouse building, was central to the development of the plant or its technical processes. Therefore the building is not eligible for inclusion in the NRHP/CRHR for historical significance.

Although William Letts Oliver and his son Roland Oliver were significant in the history of the explosives industry, no particular association was found between the Oliver family and the building. Therefore it lacks the strength of association necessary to be considered historically significant in relation to any particular persons (Criteria B/2).

The building does not embody the distinctive characteristics of a type, period, region, or method of construction, or represent the work of an important creative individual or possess high artistic values (Criterion C/3). Building 125 is a vernacular building of a type that was commonly constructed from the late nineteenth to the early twentieth century and is not located in its original location. Therefore the building is not eligible to the NHRP for its architecture.

In rare instances, buildings themselves can serve as sources of important information, however this building is not a principal source of important information in this regard (Criterion D/4).

State of California – The Resources Agency
DEPARTMENT OF PARKS AND RECREATION
PRIMARY RECORD

Primary # _____
HRI # _____
Trinomial _____
NRHP Status Code _____

Other Listings _____
Review Code _____ Reviewer _____ Date _____

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*Resource Name or # (Assigned by recorder) Richmond Field Station Building 128

P1. Other Identifier: Richmond Field Station Building 128

*P2. Location: Not for Publication Unrestricted *a. County Contra Costa

and (P2b and P2c or P2d. Attach a Location Map as necessary.)

*b. USGS 7.5' Quad Richmond Date 1984 T _____; R _____; ¼ of Sec _____; Diablo B.M.

c. Address _____ City _____ Zip _____

d. UTM: (give more than one for large and/or linear resources) Zone 10; 558356 mE/ 4196398 mN

e. Other Locational Data: (e.g., parcel #, directions to resource, elevation, etc., as appropriate)

*P3a. Description: (Describe resource and its major elements. Include design, materials, condition, alterations, size, setting, and boundaries)

Building 128 is in the southwestern portion of the Richmond Field Station, along Heron Drive, adjacent to the Environmental Protection Agency building. The vernacular building does not clearly express any particular architectural style. It is 10,287 square feet, constructed circa 1930, single story, and has an irregular plan.

The building is topped with a shallow, pitched, side-gabled roof. The primary façade, that faces southeast, features a partial width entry porch and several projecting bays. The building walls are sided in horizontal wood siding. Fenestration is a combination of original, multi-light wood and replacement aluminum sashes. (See Continuation Sheet)

*P3b. Resource Attributes: (List attributes and codes) HP8: Industrial building

*P4. Resources Present: Building Structure Object Site District Element of District Other (Isolates, etc.)



P5b. Description of Photo: (View, date, accession #) Photograph 1: Northwest and southwest facades of building, camera facing northeast, January 4, 2013.

*P6. Date Constructed/Age and Sources:

Historic Prehistoric Both

Circa the 1930s/Sanborn maps

*P7. Owner and Address:

U.C. Berkeley

1301 South 46th Street

Richmond, California 94804

*P8. Recorded by: (Name, affiliation, address)

Kara Brunzell & Julia Mates

Tetra Tech

1999 Harrison Street, Ste 500

Oakland, CA 94612

*P9. Date Recorded: January 4, 2013

*P10. Survey Type: (Describe) Intensive

*P11. Report Citation: (Cite survey report and other sources, or enter "none.") Historic Properties Survey Report for Portions of the Richmond Field Station prepared by Tetra Tech, Inc, 2013.

*Attachments: NONE Location Map Sketch Map Continuation Sheet Building, Structure, and Object Record Archaeological Record

District Record Linear Feature Record Milling Station Record Rock Art Record Artifact Record Photograph Record

Other (list) _____

*Resource Name or # (Assigned by recorder) Richmond Field Station Building 128

B1. Historic Name: California Cap Company Building 4b

B2. Common Name: Building 128

B3. Original Use: Manufacturing B4. Present Use: Storage/Research

*B5. Architectural Style: Vernacular

*B6. Construction History: (Construction date, alteration, and date of alterations) Constructed circa the 1930s; northwest section added Circa 1960s; west section added Circa 1970s.

*B7. Moved? No Yes Unknown Date: _____ Original Location: _____

*B8. Related Features: _____

B9. Architect: Unknown b. Builder: Unknown

*B10. Significance: Theme N/A Area N/A

Period of Significance N/A Property Type N/A Applicable Criteria N/A

(Discuss importance in terms of historical or architectural context as defined by theme, period, and geographic scope. Also address integrity.)

Building 128 at Richmond Field Station does not appear to meet the criteria for listing in the National Register of Historic Places (NRHP). Furthermore, the building has been evaluated in accordance with Section 15064.5(a)(2)-(3) of the CEQA Guidelines, using the criteria outlined in Section 5024.1 of the California Public Resources Code, and does not appear to meet the significance criteria as outlined in these guidelines. Therefore, the building is not eligible for listing in the California Register of Historical Resources (CRHR). (See Continuation Sheet.)

B11. Additional Resource Attributes: (List attributes and codes)

*B12. References: See Footnotes

B13. Remarks:

*B14. Evaluator: Kara Brunzell

*Date of Evaluation: January 2013

(This space reserved for official comments.)

