Appendix A

Aesthetics Technical Memorandum

MEMORANDUM

To:	Michael Haberkorn, Gatzke Dillon & Ballance
From:	Josh Saunders, Dudek
Subject:	SDSU Brawley Sciences Building Project – Aesthetics and Visual Resources Technical Memorandum
Date:	August 15, 2023
cc:	Sarah Lozano, Kirsten Burrowes, Dudek
Attachments:	Figures 1-6

Dudek has conducted an evaluation pursuant to the requirements of the California Environmental Quality Act (CEQA), California Public Resources Code 21000, et seq., to document existing visual conditions and potential impacts related to the aesthetic and visual character and views associated with construction and operation of the proposed San Diego State University (SDSU) Imperial Valley Campus Brawley Sciences Building Project (project or proposed project), located east of Brawley, California. This technical memorandum provides the results of the visual resources analysis.

1 Project Location and Setting

The project is located at 560 California State Route (SR) 78 (also referred to as Ben Hulse Highway) in Imperial County, east of the city of Brawley. Regional access to the campus is provided by SR 111 and SR 86 to the west and northwest, respectively, and SR 115 to the east. (See Figure 1, Regional/Campus Location.) The proposed project site is surrounded by agricultural uses to the north, south, and west. Undeveloped land and a solar farm are located directly east of the proposed project site. The proposed sciences building would be constructed northeast of existing campus Building 101, and the associated parking lot. Project construction staging areas would occupy the area of campus located southeast of the site and north of SR 78. (See Figure 2, SDSU Brawley Project Site and Staging Area.)

2 Project Description

In September 2003, CSU certified an environmental impact report and approved a Campus Master Plan for development of the SDSU Brawley campus (Brawley campus or campus), which would serve as an extension of the existing SDSU Imperial Valley Campus (IVC) located in Imperial County. The IVC is an extension of SDSU's main campus located in San Diego and furthers the university's regional educational mission to provide additional educational opportunities to the outlying communities of Imperial County. The approved Campus Master Plan and certified environmental impact report (EIR) provided sufficient environmental analysis and the authorization necessary for the enrollment of up to 850 full-time equivalent (FTE) students and corresponding faculty and staff and a framework for development of the facilities necessary to serve the approved campus enrollment.

The Brawley campus is approximately 200 acres in size and is located east of the city of Brawley (city). (See Figure 1.) Currently, the campus has been partially built out with educational and support facilities, although much of the campus remains undeveloped or used for active agriculture. As noted above, the environmental impacts associated with development of the Brawley campus, including the student enrollment of up to 850 FTE, were evaluated at a program level of review in the previously certified 2003 SDSU Imperial Valley Campus Master Plan Project EIR (2003 EIR) (SCH 200251010). In CSU's effort to build out the IVC, consistent with the previously approved Campus Master Plan, SDSU now proposes construction and operation of a sciences building that would be located on the Brawley campus.

The proposed project involves the construction and operation of a STEM building (science, technology, engineering and mathematics) that would house teaching labs, lecture spaces, faculty/administration offices, research spaces, and conference rooms, as well as mechanical, electrical and telecom support spaces.

The proposed project site is approximately 3.2-acres in size and the construction staging areas would occupy approximately 1-acre in the area of campus located southeast of the site and north of SR 78. The project includes 61,119 sf of on-site landscaping including the construction of bio-retention areas to capture stormwater runoff from stormwater drainages systems that would be located throughout the project site. Hardscape improvements would include 41,297 sf of sidewalks and pedestrian walkways which would connect the project site to existing campus buildings and parking lot.

Additionally, the Project would require new points of connection to domestic water, fire water, and sewer lines from existing utility lines to serve the new building, as well as new domestic water line infrastructure. Potable water would be provided by the city of Brawley, as well as sewer and wastewater collection services. New utility infrastructure would also be required to support electrical services for the building, as well as a back-up diesel operated generator.

The proposed project building would have an area of 36,900 gross sf and be approximately 35 feet in height. The project would be built over the course of 19 months, with construction estimated to begin in January 2024. Construction and equipment staging would require 1-acre of space within the campus, directly east of the existing building (Building 101) and parking lot (See Figure 2). The project would involve site preparation, grading, and excavation associated with project construction. Excavation depths are anticipated to be 2-5 feet. Waste (i.e., excavated gravel/soil) generated during project construction would be balanced within the site.

3 Analysis Methodology

The analysis presented here considers the potential environmental impacts of the proposed project relative to existing conditions. Establishment of the project site's existing visual resources conditions has been informed using information from the previously certified 2003 EIR (SDSU 2003) related to views and visual character, updated, as applicable, based on recent observations and photographic documentation of the campus conducted during a February 2023 site visit. Several photographs (i.e., Photos A through G) taken during the February 2023 site visit are referenced in Section 4.1.1 below and the location of the photographss relative to the Brawley campus and project is presented on Figure 3, Existing Conditions – Key Map. Photosgraphs A through G are presented on Figures 4 and 5. Other information reviewed during preparation of this analysis includes the California Department of Transportation (Caltrans) Scenic Highway System Map, Imperial County General Plan (Circulation & Scenic Highways Element and Conservation and Open Space Element) and, and Imperial County General Plan EIR.

4 Visual Resources

4.1 Existing Conditions

Visual Character and Quality

Regional

The Brawley campus is located within central Imperial County, which lies within the southeastern corner of California near the Mexico border. Imperial County comprises a broad, relatively flat desert environment that is bordered on the west and east by distant mountainous and hilly terrain and is traversed by a number of state highways/routes and Interstate 8 (I-8). In addition to including several incorporated cities (including Brawley), portions of Imperial County including the areas surrounding the Brawley campus have been transformed into agricultural fields through the construction of canals (and drains) and importation of irrigation water. More recently, wind turbine and solar photovoltaic energy development has been proposed and constructed in Imperial Valley, both on previously undisturbed desert lands and on land formerly used for agriculture.

Project Site and Surrounding Area

The project site encompasses primarily vacant land previously designated and approved for development in the southwest portion of the previously approved SDSU Brawley Campus Master Plan. As shown on Figure 2, the project site generally overlies the footprint of Future Classroom 102, which is situated in the “Academic” area of the Brawley Campus Master Plan. The project site includes two gravel surfaced picnic bench areas featuring rectangular and metal canopies/pergolas (approximately 10 feet high) and generally undeveloped terrain. (See Figure 4, Photo A.) Approximately 50 percent of the project site extends outside an existing campus fence and encompasses an improved dirt path/road surrounding the fence, an adjacent drain/narrow canal, and active agricultural lands that appear to support low-growing row crops or grasses. (See Figure 4, Photo B.) Located approximately 175 feet to the southeast of the proposed project site is the proposed staging area (approximately 52,000 square feet in size). The staging area is a flat, rectangular-shaped area outside of the existing paved campus parking lot that currently supports thin metal framing/lighting elements (approximately 12-15 feet high) above rectangular metal siding as well as irrigation lines on the ground surface associated with indeterminate agricultural use (potentially research or exploratory agricultural). (See Figure 4, Photos C and D.)

The project site is surrounded by active agricultural fields to the north, agricultural fields and a miscellaneous staging/laydown area to the east, the existing campus parking lot and associated perimeter landscaping strip to the south, and the existing campus building (“William and Susan Brandt Building”) to the west. The agricultural fields to the north and east appear to support dark green, low-growing agricultural row crops (potentially spinach or similar) or grasses. (See Figure 5, Photo E.) A storage/laydown area is located to the east of the project site and features two metallic shipping containers (painted white (1) and forest green (1)), miscellaneous plastic piping, wood crates, a large plastic cylindrical water (or other liquid material) tank, and other indeterminate materials spread across an approximately 3.2-acre, L-shaped fenced area. (See Figure 5, Photo F.) An existing rack-mounted solar photovoltaic development is located approximately 1,000 feet to the northeast of the project site (the solar development is located east of an existing north-south dirt access road and irrigation drain). (See Figure 5, Photo G.) The paved driveway off SR 78 and campus parking lot is located to the south of the project site. The perimeter landscaping features drought-tolerant trees (including palms and other), shrubs (including agave and cacti), decorative rock, and internal planting areas (parking lot islands). (See Figure 5, Photo H.) The existing Brawley campus building is generally rectangular in structure (approximately 11,000 sf and 15-20 feet high) featuring light cream/off-white painted, stucco clad exteriors with tan tile accents at pillars and along the lower portion of outward-facing building exteriors. (See Photo H.) In addition to the main entrance, areas off the north, south, and east wings of the building are topped with pitched, red-tiled roofs (the balance of the building is topped by a flat roof that supports HVAC and other building systems).

Scenic Vistas

While the Imperial County General Plan Conservation and Open Space Element does not identify scenic vistas (it does mention that Anza-Borrego Desert State Park features among other amenities and resources “sweeping vistas”), two overlooks – the Osborne Overlook and Juan Bautista Anza Overlook – are identified and described as offering scenic views of the surrounding landscape (Imperial County 1993). The Osborne Overlook is located approximately 20 miles to the east of the project site in the Imperial Sand Dunes Recreation Area and the project site is not visible from Osborne Overlook Park. The Juan Bautista de Anza Overlook is located in the southwestern corner of Imperial County and near the San Diego County border (i.e., approximately 30 miles from the project site) and, due to distance, is not visible from the project site nor vice versa. Although not considered scenic vistas, the County’s natural features, including deserts, sand dunes, mountains, and the Salton Sea, are identified as scenic visual resources by the County. Mountains located approximately 30 miles away from the campus, in the north central portion of Imperial County, are visible from SR-78 along the frontage of the proposed staging area. Representative northerly views from SR-78 near the project site and staging area are presented in Figure 6, Representative Views from SR 78.

Scenic Highways

The nearest State Scenic Highway (SR 78 at SR 86; an eligible state scenic highway) is located approximately 24 miles to the northwest of the project site.

Light and Glare

In addition to rural residential and minor industrial uses located east of the SDSU Brawley campus (approximately 0.3 miles to the east of the project site; lighting consists primarily of interior sources), the SDSU Brawley campus is the primary source of fixed lighting and potential glare in the immediate project area. Specifically, campus parking lot lighting (pole mounted lights are installed along the parking lot perimeter) and wall mounted lighting on the exterior of the Brawly campus building contribute light sources to the existing nighttime environment.

5 Impact Analysis and Conclusions

5.1 Thresholds of Significance

The thresholds of significance used to evaluate the impacts of the proposed project related to aesthetics and visual resources are based on Appendix G of the California Environmental Quality Act (CEQA) Guidelines. A significant impact under CEQA would occur if the proposed project would:

a) Have a substantial adverse effect on a scenic vista?

b) Substantially damage scenic resources, including, but not limited to, trees, rock outcroppings, and historic buildings within a state scenic highway?
c) In nonurbanized areas, substantially degrade the existing visual character or quality of public views of the site and its surroundings? (Public views are those that are experienced from publicly accessible vantage point). If the project is in an urbanized area, conflict with applicable zoning and other regulations governing scenic quality?
d) Create a new source of substantial light or glare which would adversely affect day or nighttime views in the area?

5.2 Impact Analysis

a) Would the project have a substantial adverse effect on a scenic vista?

The Initial Study (IS) prepared as part of the 2003 Campus Master Plan EIR determined that no impact would occur from development of the Campus Master Plan with regard to potential adverse effects to scenic vistas.

As described above, while the Imperial County General Plan does not identify “scenic vistas”, two overlooks – the Osborne Overlook and Juan de Bautista Anza Overlook – are identified in the General Plan and described as offering scenic views of the surrounding landscape (Imperial County 1993). The Osborne Overlook is located approximately 20 miles to the east of the project site in the Imperial Sand Dunes Recreation Area and due to the distance, the project site is not visible from Osborne Overlook Park. The Juan de Bautista Anza Overlook is in the southwestern corner of Imperial County and is approximately 30 miles from the project site. Similar to the Osborne Overlook, due to the distance, the Anza overlook does not provide views to the project site. Views to distant mountain terrain in the northern and northeastern portions of Imperial County are visible as SR 78 motorists approach and pass the SDSU Brawley campus. However, available views are occasionally interrupted by landscaping (trees on private property including the SDSU Brawley campus) and development (including the approximately 20-foot high William and Susan Brandt Building on the SDSU Brawley campus). While the construction and operation of the approximate 35-foot high, approximately 43,000 square foot STEM building (and proposed site landscape trees) would similarly interrupt available views to distant mountains, such views are available to SR 78 motorists throughout the County. In addition, the STEM building would be set back approximately 400 feet from SR 78. This distance would reduce the apparent scale of the proposed building as viewed from SR 78 and would be viewed within the context of the existing campus building and parking lot landscaping. Because the view corridor across the project site has been altered by existing development and landscaping on the campus, interruption of views from SR 78 to distant mountains would be brief in the visual experience of motorists, and because similar distant views are available to state route motorists throughout Imperial County, the construction and operation of the project would not have a substantial adverse effect on a scenic vista. Therefore, impacts would be **less than significant.**

b) Would the project substantially damage scenic resources, including, but not limited to, trees, rock outcroppings, and historic buildings within a state scenic highway?

The IS prepared for the 2003 EIR determined that no impact would occur with regard to substantial damage to scenic resources within a state scenic highway.

The project site is located approximately 24 miles from the nearest State Scenic Highway (i.e., SR-78 from the San Diego/Imperial County border to SR-86). As a result, construction activities and operation of the project would not be visible from the nearest State Scenic Highway. In addition, the project site does not support trees, rock outcrops, historic buildings or other potentially scenic resources, including scenic visual resources identified in the County General Plan Conservation and Open Space Element (i.e., deserts, sand dunes, mountains, and the Salton Sea). Therefore, **no impacts** to scenic resources within a state scenic highway would occur.

c) In non-urbanized areas, would the project substantially degrade the existing visual character or quality of public views of the site and its surroundings? (Public views are those that are experienced from publicly accessible vantage point). If the project is in an urbanized area, would the project conflict with applicable zoning and other regulations governing scenic quality?

The 2003 EIR did not analyze potential impacts to the existing visual character or quality of public views of the site and its surroundings. A discussion regarding the proposed project's potential to substantially degrade the existing visual character or quality of public views of the site and its surroundings is provided below.

As of July 1, 2021, the estimated population of the City of Brawley was 26,539 persons (United States Census Bureau 2023). The City of Brawley is not contiguous with any of the other incorporated cities in Imperial County and therefore, pursuant to Public Resource Code Section 21071, the City and project site are within a non-urbanized area.

Views of the project site and SDSU Brawley campus are primarily available to the public from nearby SR 78. Representative views to the project site from eastbound and westbound SR 78 are provided in Figure 6, Representative Public Views to Project Site. As shown in this figure, existing visual character reflects a primarily agricultural environment as evidenced by the presence of relatively flat, altered, and irrigated terrain. However, the existing SDSU Brawley campus (specifically, parking lot, site landscaping, and the approximately 20-foot high, 11,000 square foot William and Susan Brandt Building) also contribute to the local visual environment and add a developed element with verticality and mass to the existing landscape. As proposed, the STEM building would be situated near the existing campus parking lot and would encompass an area supporting covered picnic tables, an unimproved access road, adjacent earthen drain, and agricultural fields. The building would also be situated approximately 90 feet to the northeast of the existing campus building. Public views towards the proposed building from SR 78 would be filtered (and partially screened by) intervening campus landscaping, a research agricultural "project" on the site of the proposed staging area, and the existing campus building. While the proposed STEM building bulk and scale would be larger than the existing campus building, apparent bulk and scale as perceived from SR 78 would be reduced due to the presence of intervening development, landscape, and the STEM buildings' 400-foot setback from the state route. Further, the introduction of the STEM building would be softened by proposed landscaping and would include perimeter and common area landscaping consisting of shrubs, trees, decorative rock, and potentially, disintegrated granite. In addition to softening building introduction, proposed landscaping would be consistent with existing campus development and blend the project into to the existing setting. Lastly, the quality of transient public views of the site and surrounding area would not be substantially degraded by project implementation because development would progress in an orderly phased fashion and the STEM building would be viewed within the context of existing development and landscaping at the Brawley campus. Therefore, the project would not substantially degrade the existing visual character or quality of public views of the site and its surroundings. Impacts would be **less than significant.**

d) Would the project create a new source of substantial light or glare which would adversely affect day or nighttime views in the area?

The IS prepared for the Campus Master Plan 2003 EIR determined that with implementation of lighting standards in compliance with relevant goals and policies of the County of Imperial General Plan, the incorporation of artificial lighting mitigation measures, and the siting of recreational fields (and associated field lighting) away from planned residential housing areas, potential lighting and glare impacts would be **less than significant.** The referenced mitigation measure is found in Section 3.1, Land Use and Planning, of the 2003 EIR and it requires compliance with Title 24 (or California Green Building Standards Code) of the California Code of Regulations, which includes requirements for indoor and outdoor lighting systems associated with new development (see MMRP page 11-1)[1]

Construction of the project would occur over an approximate 19-month timeframe. While a detailed lighting plan or schedule has not been prepared, lighting sources anticipated to be installed on the project site to support the STEM building would be similar to those installed on the existing SDSU Brawley campus. For example, sidewalk and walkway lighting consisting of low post or standard pole lighting is anticipated to be installed as is wall mounted ("wall pack") fixtures on the exterior of the future STEM building. Overhead lighting in common areas (i.e., pathways, near building entrance) may also be installed. Consistent with existing uses at the Brawley campus, new lighting sources would be of appropriate intensity for the intended use (e.g., safety, security, and/or general illumination for pedestrians), and would generally be hooded and directed downward to minimize potential for skyglow, glare, and/or light trespass to off-campus areas **[Note to Reviewers: please confirm lighting details described in this paragraph, above].** In addition, all exterior lighting sources installed on the project site would be compliant with California Energy Code allowances for lighting power and lighting control requirements and with Title 24, Part 6, the California Green Building Standards Code requirements related to light pollution reduction. For example, Title 24, Part 6, Section 130 outlines mandatory requirements for lighting systems and equipment for nonresidential occupancies. These include but are not limited to wattage requirements, lighting controls, and light shielding/glare requirements in accordance with American National Standards Institute/Illuminating Engineering Society (ANSI/IES) standards . Because lighting installed on the project site would be of a similar distribution and intensity of existing sources on the SDSU Brawley campus, and because lighting sources would be hooded, directed downward, and compliant with applicable standards (i.e., Title 24, ANSI/IES) for lighting control and light pollution reduction, the project would not create a new source of substantial light or glare which would adversely affect day or nighttime views in the area. Impacts would be **less than significant**, and no additional mitigation is required.

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1 **3.1 Land Use and Planning Mitigation Measure** included on Page 11-1 of the 2003 EIR: SDSU will make best efforts to comply with local government design guidelines, and all construction will comply with Title 24.

6 References

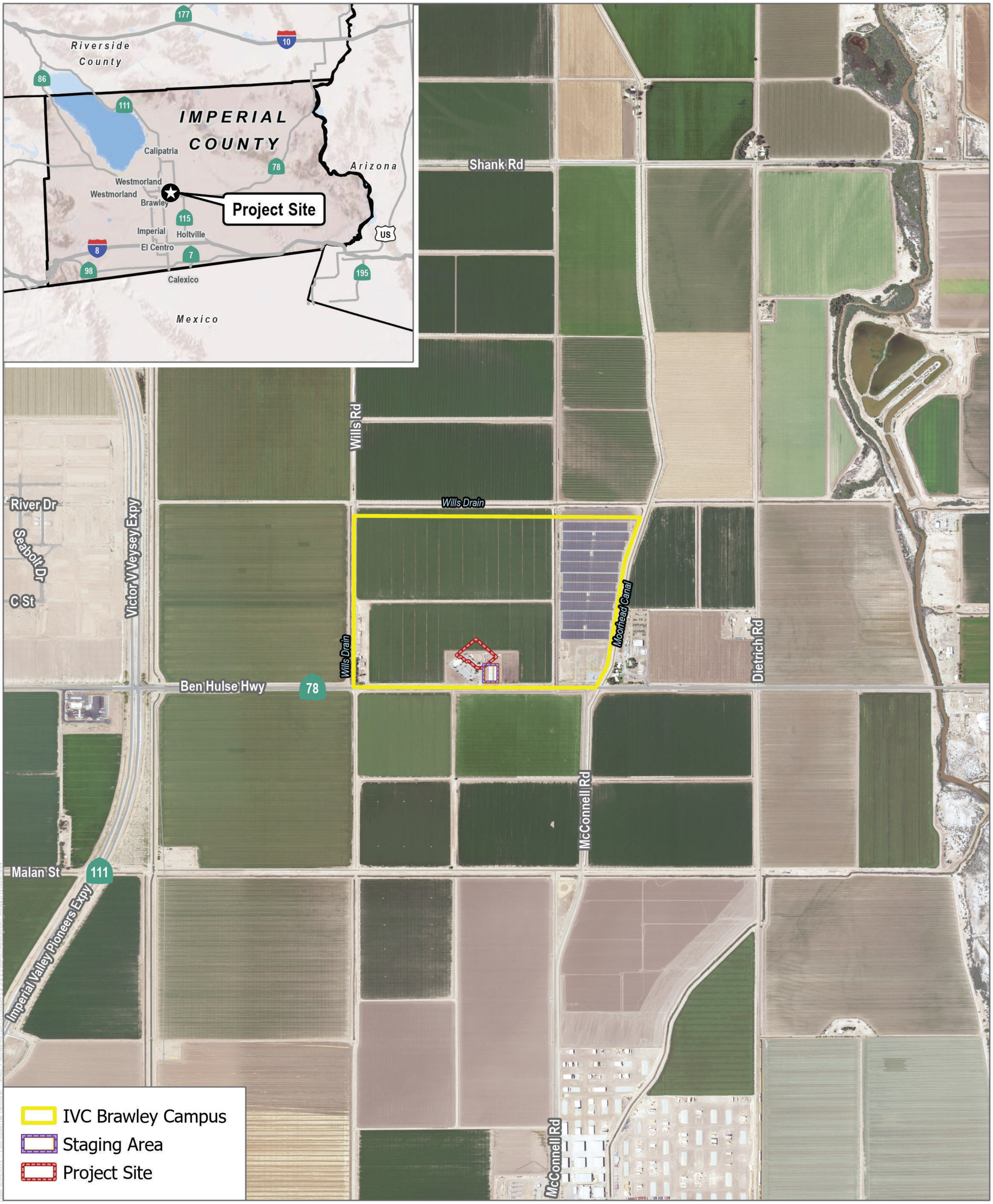
Caltrans (California Department of Transportation). 2023. State Scenic Highway System Map. Accessed March 3, 2023.

Imperial County. 1993a. Final Program EIR for the County of Imperial General Plan.

Imperial County. 1993b. General Plan.

SDSU (San Diego State University). 2003. SDSU Imperial Valley Campus Master Plan Project (SCH No. 200251010).

United States Census Bureau. 2023. QuickFact, Brawley city, California. https://www.census.gov/quickfacts/brawleycitycalifornia. Accessed March 3, 2023.



SOURCE: NAIP 2020, Open Streets Map 2019

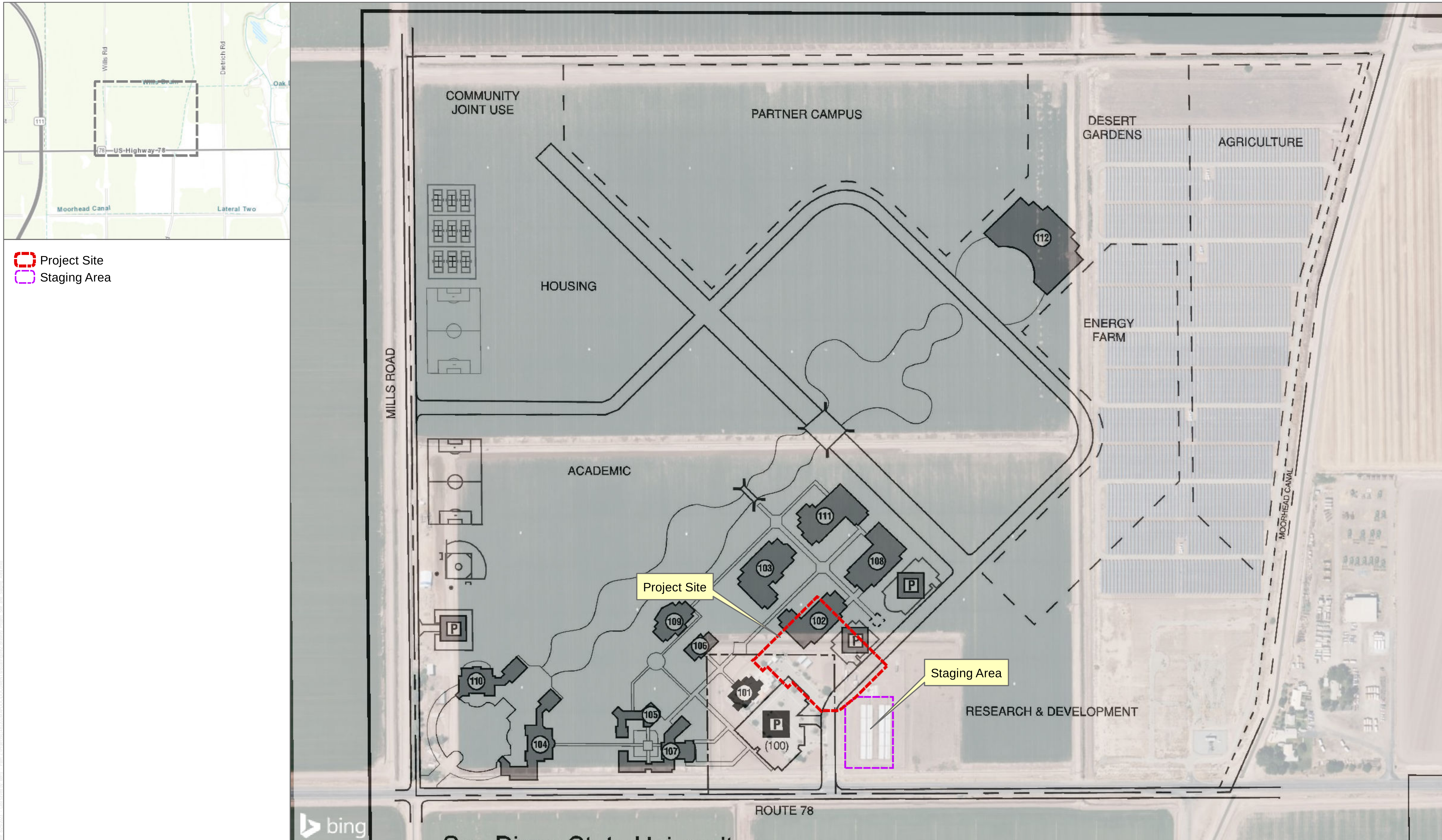
DUDEK

0 1,000 2,000 Feet

FIGURE 1

Regional/Campus Location

SDSU Brawley Sciences Building Project



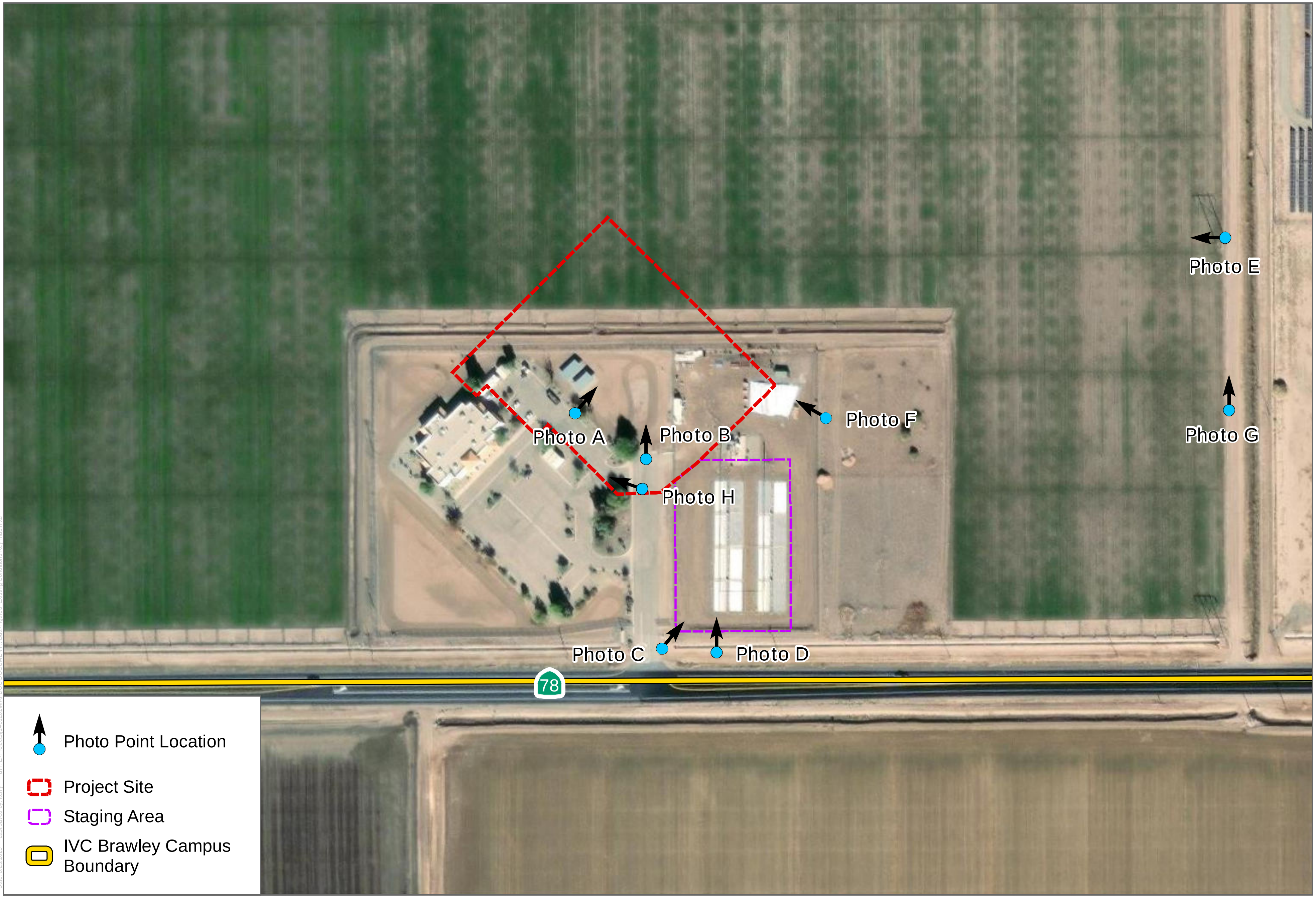
SOURCE: AERIAL-BING MAPPING SERVICE 2022; CAMPUS MASTER PLAN 2003

DUDEK 0 175 350 Feet

FIGURE 2

SDSU Brawley Project Site and Staging Area

SDSU Brawley Sciences Building Project



SOURCE: ESRI IMAGERY SERVICE 2022

DUDEK

0 80 160 Feet

FIGURE 3

Existing Conditions - Key Map

SDSU Brawley Sciences Building Project

Photo A: View NE from SDSU Brawley Campus parking lot towards project site

Photo B: View N from SDSU Brawley Campus driveway towards project site and existing agricultural fields

Photo C: View NE from SR-78/Bixby Lane intersection towards staging area site and campus gate

Photo D: View N from southern boundary of proposed staging area site.

SOURCE: DUDEK 2023

DUDEK

FIGURE 4

Project Site and Staging Area - Existing Conditions and Features

SDSU Brawley Sciences Building Project

Photo E: View W from offcampus access road towards agricultural fields to north of project site and staging area (project site located 950 feet away)

Photo F: View W-NW towards existing fenced storage and laydown area

Photo G: View N from offcampus access road towards utility corridor, solar farm, and distant mountains

Photo H: View northwest from SDSU Brawley Campus parking lot towards existing campus building (i.e., William and Susan Brandt Building)

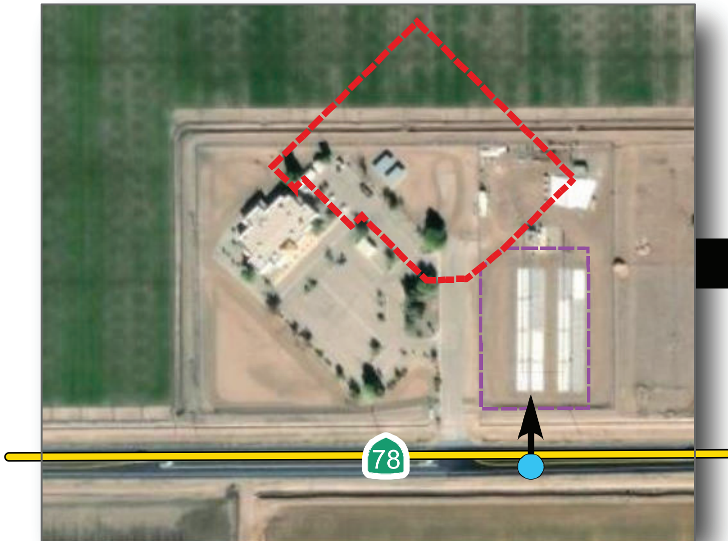
SOURCE: DUDEK 2023

DUDEK

FIGURE 5

Surrounding Area - Existing Conditions and Features

SDSU Brawley Sciences Building Project



View N from SR-78 towards staging area (distant mountains faint but visible in background)

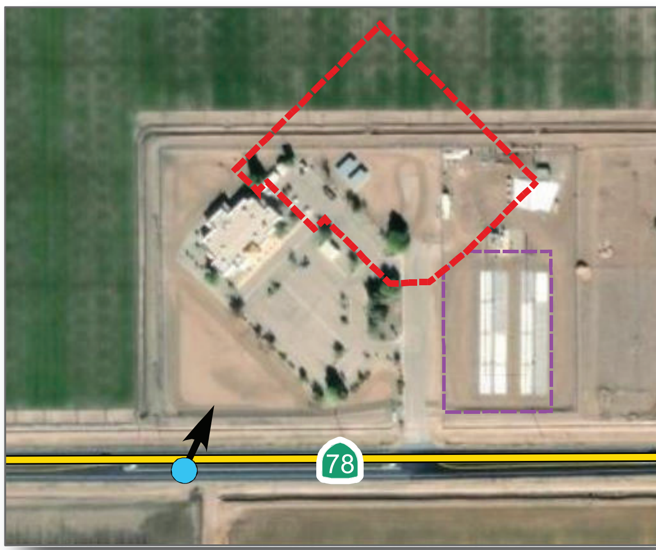


Photo Point Location

IVC Brawley Campus Boundary

Project Site

Staging Area

View NE from SR-78 towards SDSU Brawley Campus building and parking lot (distant mountains visible but regularly blocked by landscaping)

SOURCE: DUDEK 2023

DUDEK

FIGURE 6

Representative Views from SR-78

SDSU Brawley Sciences Building Project

Appendix B

AQ/GHG/Energy Technical Memorandum

MEMORANDUM

To:	Michael Haberkorn, Gatzke Dillon & Ballance LLP
From:	Sarah Halterman, Air Quality Specialist, Dudek
Subject:	SDSU Imperial Valley Campus Brawley Sciences Building Project Air Quality, Greenhouse Gas Emissions, and Energy Technical Memo
Date:	August 25, 2023
cc:	Sarah Lozano, Alexandra Martini, Dudek
Attachment(s):	Attachment A – Figures Attachment B - Air Quality and Greenhouse Gas Emissions CalEEMod Output Files

Dudek has conducted an evaluation to determine potential impacts related to air quality, greenhouse gas (GHG) emissions, and energy associated with the proposed California State University (CSU) San Diego State University (SDSU) Brawley Sciences Building Project (project or proposed project), located in Imperial County, California.

This assessment uses the significance thresholds in Appendix G of the California Environmental Quality Act (CEQA) Guidelines (14 CCR 15000 et seq.) and, while CSU as a state agency is not subject to local or regional planning regulations, is based on the emissions-based significance thresholds recommended by the Imperial County Air Pollution Control District (ICAPCD) and other applicable thresholds of significance.

The certified 2003 SDSU Imperial Valley Master Plan Project environmental impact report (EIR) analyzed the air quality impacts associated with development of a Campus Master Plan at the Brawley site at a program level of review. This technical memo presents an analysis of potential impacts associated with construction and operation of the proposed sciences building at a project-specific level of review, evaluating the potential for project-generated construction and operational criteria air pollutant emissions to exceed established state and federal ambient air quality standards, result in adverse health impacts on sensitive receptors, or conflict with the implementation of applicable air quality management plans. The technical memo also evaluates if implementation of the proposed project would result in GHG emissions that would have a significant impact on the environment or if the project would conflict with applicable plans, policies, or regulations for the purpose of reducing GHG emissions. Finally, the technical memo evaluates if implementation of the project would result in wasteful, inefficient, or unnecessary consumption of energy, or conflict with plans for renewable energy or energy efficiency.

As described below, this technical memo concludes that the proposed project would result in less than significant impacts related to air quality, GHG emissions, and energy use.

1 Project Location and Setting

The project is located at 560 California State Route (SR) 78 (also referred to as Ben Hulse Highway) in Imperial County, east of the city of Brawley. Regional access to the campus is provided by SR 111 and SR 86 to the west and northwest, respectively, and SR 115 to the east (See Attachment A: Figure 1). The proposed project site is surrounded by agricultural uses to the north, south, and west. Undeveloped land and a solar farm are located directly east of the proposed project site. The proposed sciences building would be constructed northeast of existing campus Building 101, and the associated parking lot. Project construction staging areas would occupy the area of campus located southeast of the site and north of SR 78 (See Attachment A: Figure 2).

2 Project Description

In September 2003, CSU certified an environmental impact report (EIR) and approved a Campus Master Plan for development of the SDSU Off-Campus Brawley Center (Brawley Center), which would serve as an extension of the existing SDSU Imperial Valley Campus (IVC) located in Imperial County. The IVC is an extension of SDSU's main campus located in San Diego and furthers the university's regional educational mission to provide additional educational opportunities to the outlying communities of Imperial County. The approved Campus Master Plan and certified EIR provided sufficient environmental analysis and authorization necessary for enrollment of up to 850 full-time equivalent (FTE) students and corresponding faculty and staff, and a framework for development of the facilities necessary to serve the approved campus enrollment.

The Brawley Center is approximately 200 acres in size and is located east of the city of Brawley (city). Currently, the Brawley Center has been partially built out with educational and support facilities, although much of the campus remains undeveloped or used for active agriculture. As noted above, the environmental impacts associated with development of the Brawley campus, including a student enrollment up to 850 FTE, were evaluated at a program level of review in the previously certified SDSU Imperial Valley Campus Master Plan Project EIR (2003 EIR) (SCH 200251010). In CSU's effort to build out the IVC consistent with the previously approved Campus Master Plan, SDSU now proposes construction and operation of a sciences building that would be located on the Brawley campus.

The proposed project involves the construction and operation of a sciences building (science, technology, engineering, and mathematics) that would house teaching labs, lecture spaces, faculty/administration offices, research spaces, and conference rooms, as well as mechanical, electrical, and telecom support spaces. The proposed project does not include/propose any increase in the previously authorized and approved maximum student enrollment of 850 FTE.

The proposed project site is approximately 3.2-acres in size, including hardscape and landscape improvements; and the construction staging areas would occupy approximately 1 acre in the area of campus located southeast of the site and north of SR-78. The project includes 61,119 sf of on-site landscaping, including the construction of bio-retention areas to capture stormwater runoff from stormwater drainages systems that will be located throughout the project site. Hardscape improvements will include 41,297 sf of sidewalks and pedestrian walkways, which will connect the project site to existing campus buildings and parking lot.

Additionally, the project will require new points of connection to domestic water, fire water, and sewer lines from existing utility lines to serve the new building, as well as new domestic water line infrastructure. Potable water will be provided by the city of Brawley, as well as sewer and wastewater collection services. New utility infrastructure will also be required to support electrical services for the building, as well as a back-up diesel operated generator. Additionally, the project would introduce 54 kilowatts (kW) of on-site solar.

The proposed project building would have an area of 36,900 gross sf and would be approximately 35 feet in height. The project is projected to be built over the course of 19 months, with construction estimated to begin in January 2024.Construction and equipment staging would require 1-acre of space within the campus, directly east of the existing building (Building 101) and parking lot. The project would involve site preparation, grading, and excavation associated with project construction. Excavation depths are anticipated to be 2 to 5 feet. Waste (i.e., excavated gravel/soil) generated during project construction would be balanced within the site.

3 Analysis Methodology

The project Site is located within the Salton Sea Air Basin (SSAB) and is within the jurisdictional boundaries of the Imperial County Air Pollution Control District (ICAPCD), which has jurisdiction over the central portion of Riverside County (Coachella Valley) and all of Imperial County, where the proposed project is located. The California Emissions Estimator Model (CalEEMod) Version 2022.1.1.1818 was used to estimate emissions from construction and operation of the proposed project (California Air Pollution Control Officers Association [CAPCOA] 2023). CalEEMod is a statewide computer model developed in cooperation with air districts throughout the state to quantify criteria air pollutant and GHG emissions associated with construction activities and operation of a variety of land use projects, such as residential, commercial, and industrial facilities. CalEEMod input parameters, including the land use type used to represent the project and its size, construction schedule, and anticipated use of construction equipment, were based on information provided by the applicant or default model parameters if project specifics were unavailable. Based on the proposed project schedule, construction would commence in January 2024 and last approximately 19 months. The first full year of the proposed project's operation would be 2026, after completion of construction.

The analysis presented here considers the potential environmental impacts of the proposed project relative to existing conditions. Establishment of the project site's existing air quality, GHG emissions, and energy conditions and assessment of project-attributed environmental air quality, GHG emissions, and energy impacts has been prepared using information contained in the previously certified 2003 EIR, with the information updated, as necessary, to reflect specific conditions of the proposed project.

At the time the EIR for the SDSU Imperial Valley Campus Master Plan Project was certified in 2003, an evaluation of GHG emissions and energy was not required under CEQA. Since that time, California's legal landscape has changed relative to the consideration of GHG emissions and energy under CEQA via the enactment of numerous statutory schemes, the promulgation of implementing regulations, the issuance of executive orders and planning documents at the state, regional and local levels, and the publication of relevant judicial decisions. While CEQA now requires evaluation of potential GHG emission and energy impacts of a project, based on the *Citizens for Responsible Equitable Environmental Development v. City of San Diego* (2011) decision and other published case law, information about the effects of GHG emissions and energy is not "new information" triggering a requirement to prepare a subsequent or supplemental EIR under CEQA Guidelines Section 15162(a)(3).

However, as this proposed project is being considered under the umbrella of the 2003 EIR, this environmental analysis also has considered the relevance of CEQA Guidelines Section 15168(c)(1), which addresses the use of program EIRs for purposes of streamlining the environmental review of implementing projects. Under that provision, "[i]f a later activity would have effects that were not examined in the program EIR, a new initial study would need to be prepared leading to either an EIR or a negative declaration." Therefore, pursuant to CEQA Guidelines Section 15168(c)(1), an analysis of the proposed project's GHG emissions and energy has been prepared, as described in Sections 5 and 6 below.

The 2003 EIR adequately analyzed the potential air quality impacts associated with development of a Campus Master Plan with an enrollment of 850 full-time equivalent (FTE) students. Because the proposed project would not result in an increase in student enrollment above the approved enrollment number, the air quality analysis presented here is limited to the specific impacts associated with construction and operation of the proposed sciences building.

4 Air Quality Assessment

Criteria air pollutants are defined as pollutants for which the federal and state governments have established ambient air quality standards, or criteria, for outdoor concentrations to protect public health. Criteria air pollutants that are evaluated include reactive organic gases (ROGs), oxides of nitrogen (NOx), carbon monoxide (CO), sulfur oxides (SOx), particulate matter with an aerodynamic diameter less than or equal to 10 microns in size (coarse particulate matter, or PM_{10}), and particulate matter with an aerodynamic diameter less than or equal to 2.5 microns in size (fine particulate matter, or $PM_{2.5}$). ROGs and NOx are important because they are precursors to ozone (O_3).

Criteria air pollutant emissions associated with construction of the proposed project were estimated for the following emission sources: operation of off-road construction equipment, architectural coating, on-road vendor (material delivery) trucks, and worker vehicles. The operational criteria air pollutant emissions were estimated from area sources, energy sources, and stationary sources. As stated in Section 2, Project Description, the project does not include nor propose any increase in the previously authorized and approved maximum student enrollment of 850 FTE. Because the proposed project FTE student enrollment is consistent with the FTE parameter used in the 2003 EIR analysis, CEQA does not require that operational emissions related to mobile sources be included in the project-level analysis herein. Therefore, air quality impacts analyzed herein are focused on those that would result from construction and operation of the proposed sciences building envelope / site footprint.

4.1 Air Quality Impact Analysis and Conclusions

4.1.1 Thresholds of Significance

The significance criteria used to evaluate the project impacts to air quality are based on the recommendations provided in Appendix G of the CEQA Guidelines. For the purposes of this air quality analysis, a significant impact would occur if the project would (14 CCR 15000 et seq.):

a) Conflict with or obstruct implementation of the applicable air quality plan?
b) Result in a cumulatively considerable new increase of any criteria pollutant for which the project region is nonattainment under an applicable federal or state ambient air quality standard?
c) Expose sensitive receptors to substantial pollutant concentrations?
d) Result in other emissions (such as those leading to odors) adversely affecting a substantial number of people?

Appendix G of the CEQA Guidelines (14 CCR 15000 et seq.) indicates that, where available, the significance criteria established by the applicable air quality management district or air pollution control district may be relied upon to determine whether a project would have a significant impact on air quality.

The ICAPCD has established numeric significance thresholds to assist lead agencies in determining whether a proposed project may have a significant air quality impact. A project would result in a substantial contribution to an existing air quality violation of the NAAQS or CAAQS for O_3, which is a nonattainment pollutant, if the project's construction or operational emissions would exceed ICAPCD's ROG or NOx significance thresholds. These emissions-based thresholds for O_3 precursors are intended to serve as a surrogate for an "ozone significance threshold" (i.e., the potential for adverse O_3 impacts to occur) because O_3 itself is not emitted directly, and the effects of an individual project's emissions of O_3 precursors (ROG and NO_x) on O_3 levels in ambient air cannot be determined through air quality models or other quantitative methods. The SSAB is also designated as nonattainment for the federal and state PM_{10} standards and designated as unclassified or in attainment for all other criteria air pollutants.

The 2017 ICAPCD CEQA Handbook provides guidelines and numeric thresholds for determining the significance of project impacts and the recommended level of environmental analysis required based on total anticipated emissions from project operations. These guidelines are provided in Table 1 below and are organized by Tier I and Tier II projects. Per the ICAPCD CEQA Handbook, projects whose operational emissions are below Tier I thresholds are not required to develop a Comprehensive Air Quality Analysis Report or an Environmental Impact Report (EIR), and can rely on an Initial Study to determine that impacts are less than significant. As discussed in Section 4.1.2 below, the proposed project is considered a Tier I project per ICAPCD guidelines.

Table 1. ICAPCD Air Quality Significance Thresholds

Pollutant	Emissions (pounds per day)		
	Operational		Construction
	Tier 1	Tier II	
ROGs	< 137	137 and greater	75
NO_x	< 137	137 and greater	100
CO	< 550	550 and greater	550
SO_x	< 150	150 and greater	-
PM_{10}	< 150	150 and greater	150
$PM_{2.5}$	< 550	550 and greater	—
Level of Significance	Less Than Significant	Significant Impact	N/A
Level of Analysis	Initial Study	Comprehensive Air Quality Analysis Report	N/A
Environmental Document	Negative Declaration	Mitigated ND or EIR	N/A

Source: ICAPCD 2017.
Notes: ICAPCD = Imperial County Air Pollution Control District; ROGs = reactive organic gases; NO_x = oxides of nitrogen; CO = carbon monoxide; SO_x = sulfur oxides; N/A = not applicable; PM_{10} = coarse particulate matter; $PM_{2.5}$ = fine particulate matter.

Thresholds of significance for project construction are also provided in Table 1. According to ICAPCD CEQA guidance, construction particulate matter impacts for Tier I projects should be qualitative as opposed to quantitative, although it is ultimately at the discretion of Lead Agencies to quantify construction emissions. As described below, the proposed project is below the operational thresholds for Tier I projects, and thus is not required to quantitatively evaluate PM_{10} impacts for construction. However, construction emissions were quantified for disclosure purposes.

Regardless of project size and whether construction emissions are quantified, the ICAPCD requires implementation of standard measures for construction equipment and fugitive PM_{10} at all construction sites. These standard measures are listed below and are collectively known as Regulation VIII- *Fugitive Dust Control Measures* of ICAPCD's Rules and Regulations. The fugitive dust benefits from implementation of these regulatory compliance measures were not included in the CalEEMod emissions modeling given that the measures cannot be reliably quantified. In this case, fugitive dust emissions (PM_{10}) generated during project construction will likely be lower than the estimates reported in Table 3, *Estimated Maximum Daily Construction Criteria Air Pollutant Emissions*, below.

a) All disturbed areas, including Bulk Material storage which is not being actively utilized, shall be effectively stabilized and visible emissions shall be limited to no greater than 20% opacity for dust emissions by using water, chemical stabilizers, dust suppressants, tarps or other suitable material such as vegetative ground cover.
b) All on site and off site unpaved roads will be effectively stabilized and visible emissions shall be limited to no greater than 20% opacity for dust emissions by paving, chemical stabilizers, dust suppressants and/or watering.
c) All unpaved traffic areas one (1) acre or more with 75 or more average vehicle trips per day will be effectively stabilized and visible emission shall be limited to no greater than 20% opacity for dust emissions by paving, chemical stabilizers, dust suppressants and/or watering.
d) The transport of Bulk Materials shall be completely covered unless six inches of freeboard space from the top of the container is maintained with no spillage and loss of Bulk Material. In addition, the cargo compartment of all Haul Trucks is to be cleaned and/or washed at delivery site after removal of Bulk Material.
e) All Track-Out or Carry-Out will be cleaned at the end of each workday or immediately when mud or dirt extends a cumulative distance of 50 linear feet or more onto a paved road within an Urban area.
f) Movement of Bulk Material handling or transfer shall be stabilized prior to handling or at points of transfer with application of sufficient water, chemical stabilizers or by sheltering or enclosing the operation and transfer line.
g) The construction of any new Unpaved Road is prohibited within any area with a population of 500 or more unless the road meets the definition of a Temporary Unpaved Road. Any temporary unpaved road shall be effectively stabilized and visible emissions shall be limited to no greater than 20% opacity for dust emission by paving, chemical stabilizers, dust suppressants and/or watering.

4.1.2 Impact Analysis

The analysis prepared for the 2003 EIR determined that there would be no significant air quality impacts as a result of development of the SDSU Brawley Campus Master Plan. The air quality assessment concluded that there would be no construction related impacts or project-related exceedances for any criteria air pollutants during operation. As such, no air quality related mitigation measures were required or identified in the 2003 EIR. A summary of the prior analysis is provided below along with the current project-specific analysis for each Appendix G significance criteria, as applicable.

Consistent with the 2003 EIR, the impact assessment herein includes analysis of construction-related air quality emissions related to off-road equipment use and material movement specific to construction of the proposed sciences building. As discussed previously, the project would not generate additional students beyond the 850 FTE contemplated in the 2003 EIR. Because the proposed project FTE enrollment would be consistent with the FTE parameter used in the 2003 EIR analysis, no further analysis of operational emissions impacts related to mobile sources is required.

a) Would the project conflict with or obstruct implementation of the applicable air quality plan?

The proposed project site is located within the SSAB, which includes all of Imperial County and the central portion of Riverside County (Coachella Valley). Imperial County, where the project is located, is within the jurisdictional boundaries of the ICAPCD. The ICAPCD is responsible for developing and implementing the clean air plans for attainment and maintenance of the NAAQS and CAAQS in the SSAB, including the 2018 PM_{10} State Implementation Plan (SIP) and the 2017 SIP for the 75 ppb 8-hour Ozone Standard.

The previous analysis prepared for the 2003 EIR found that the project would have less-than-significant impacts related to conflicting with implementation of the applicable air quality plan. Given that the proposed project is within the scope of the approved Campus Master Plan and its certified 2003 EIR, that determination remains applicable. However, because the ICAPCD has adopted additional air quality plans since certification of the 2003 EIR, a discussion of the proposed project's potential to conflict with those applicable plans that post-date the certified 2003 EIR is provided below.

The most efficient approach to determining project consistency with applicable air quality plans is assessing if the proposed development is consistent with the growth anticipated by the land use plans that were used for preparation of the air quality plans. The relevant land use plans for the proposed project include the 2003 SDSU Imperial Valley Campus Master Plan and the Imperial County General Plan.

Relatedly, ICAPCD's air quality attainment plans are based, in part, on regional population and employment (and thus vehicle miles traveled [VMT]) growth projections from the Southern California Association of Governments (SCAG), which is the designated Metropolitan Planning Organization (MPO) for Imperial County. Thus, a project's conformance with SCAG's Metropolitan Transportation Plan/Sustainable Communities Strategy that was considered in the preparation of the air quality attainment plans would demonstrate that the project would not conflict with or obstruct implementation of plans.

Further, the Imperial County General Plan is the governing land use document for physical development within the county. Projects that propose development consistent with growth anticipated by the current General Plan are considered consistent with the air quality attainment plans. If a project proposes development that is less dense than anticipated within the current General Plan, the project would likewise be consistent with the attainment plans because emissions would be less than estimated within the current General Plan. If a project proposes development that is greater than that anticipated in the General Plan and SCAG's growth projections, the project could be in conflict with the attainment plans, and might have a potentially significant impact on air quality because emissions could exceed those estimated for the existing land use plan (i.e., General Plan).

As discussed in Section 2, Project Description, student enrollment numbers and corresponding faculty and staff relating to the proposed project would be consistent with those analyzed in the previously certified EIR and approved 2003 Campus Master Plan for development of the SDSU Brawley Campus, which itself is included in the County's General Plan land use element[1]. Additionally, the project site is zoned Government/Special Public Zone (G/S), which allows for schools and research and development uses.

Implementation of the proposed project would not result in development in excess of that anticipated in local plans or increases in population growth beyond those contemplated by SCAG. Therefore, given that the proposed project is consistent with the growth projections used to prepare the air quality management plans for the SSAB (2018 PM_{10} and 2017 Ozone SIPs), the project would be consistent with these plans. Impacts related to the potential to conflict with or obstruct implementation of the applicable air quality plans would be **less than significant**.

b) Would the project result in a cumulatively considerable net increase of any criteria pollutant for which the project region is nonattainment under an applicable federal or state ambient air quality standard?

Air pollution is largely a cumulative impact. The nonattainment status of regional pollutants is a result of past and present development, and ICAPCD develops and implements plans for future attainment of ambient air quality standards. Based on these considerations, project-level thresholds of significance for criteria pollutants are relevant in the determination of whether a project's individual emissions would have a cumulatively significant impact on air quality.

The air quality analysis prepared for the 2003 EIR found that there would be no significant construction-related air quality impacts and no project-related exceedances or excessive concentrations of any criteria air pollutants per either State or federal standards.

The construction emissions estimate in the 2003 EIR was based on "typical worst day construction activities associated with a school campus construction project similar to the proposed project." The certified 2003 EIR's "typical worst day" equipment-related emissions estimation parameters included use of forklifts, off-highway trucks, tracked loaders, tracked tractor/dozers, scrapers, and rollers. Total equipment hours (i.e., total pieces of equipment x total hours of daily operation per piece) for the "typical worst day" were approximately 68 equipment hours per day. Additionally, the total earthwork quantity used in the 2003 EIR analysis was 10,000 cubic yards (CY) of material over 30 days, or 866 tons per day. As discussed in the project-specific analysis below, the construction equipment and activity anticipated for implementation of the proposed project is within the impact analysis envelope of the certified 2003 EIR.

While the proposed project fits within the impact analysis envelope of the certified 2003 EIR for equipment use and grading, the prior EIR assessment did not estimate emissions associated with off-site worker or vendor trips. Given that emissions from these sources have the potential to result in air quality impacts with construction of the proposed project, an updated project-specific estimate of air quality emissions from proposed project construction is provided.

The operational emissions estimate in the 2003 EIR included emissions from motor vehicles associated with the FTE enrollment of 850 ultimately expected at the Brawley campus. The analysis found that trip

[1] Page 27 of the *Land Use Element* of the *Imperial County General Plan* summarizes schools within the County, and includes reference to the San Diego State University-Imperial Valley Campus in Brawley (Imperial County 2015). The campus boundary (which encompasses the project site) is also included on the Imperial County Land Use Plan Map as a Community Facility (College) (Imperial County 2007).

generation associated with this increase in FTE would result in no exceedances of ICAPCD threshold levels for all criteria air pollutants. Given that the proposed project would not increase the previously approved maximum FTE enrollment, the proposed project is consistent with the 850 previously analyzed in the certified 2003 EIR, and the proposed project's impacts related to operational mobile emissions would remain consistent with the less than significant finding of the previous analysis. As such, the proposed project analysis presented herein will focus on operational emissions related to the building envelope and site footprint (e.g., energy, area sources).

The project-specific analysis for air quality impacts is discussed separately for construction and operation below.

Construction Emissions

Proposed construction activities would result in the temporary addition of pollutants to the local airshed caused by on-site sources (i.e., off-road construction equipment, soil disturbance, and ROG off-gassing) and off-site sources (i.e., on-road vendor trucks, and worker vehicle trips). Construction emissions can vary substantially from day to day, depending on the level of activity; the specific type of operation; and, for particulate matter, the prevailing weather conditions. Therefore, such emission levels can only be approximately estimated.

Internal combustion engines used by construction equipment, trucks, and worker vehicles would result in emissions of ROGs, NOx, CO, PM_{10}, and $PM_{2.5}$. Additionally, PM_{10} and $PM_{2.5}$ emissions would be generated by entrained dust, which results from the exposure of earth surfaces to wind from the direct disturbance and movement of soil. As discussed in Section 4.1.1 above, the proposed project would be required to comply with ICAPCD Rule VIII to control dust emissions generated during any dust-generating activities. Standard construction measures that would be employed to reduce fugitive dust emissions include limiting visible emissions to no greater than 20% opacity through use of chemical stabilizers, dust suppressants and/or watering. Based on the developed nature of the project site and surrounding areas, and given that on-site and off-site roads would be paved, the default percentage of paved road was adjusted to more accurately represent on-road travel during construction of the proposed project. To account for potential unpaved vehicle movement within the project site vicinity, it was conservatively estimated that 95% of all travel (i.e., worker and vendor trips) would be on paved roads, with 5% on unpaved roads.

CalEEMod Version 2022.1.1.18 was used to estimate emissions from construction of the proposed project. CalEEMod default construction parameters were used when detailed project-specific information was not available, including specific off-road equipment for each phase. The construction equipment needed to build out the proposed project is similar to that analyzed in the 2003 EIR analysis, and would include forklifts, tractors/loaders/backhoes, graders, and dozers. Maximum daily activity would require approximately 50 equipment hours per day, which is well within the scope of the 68 hours analyzed for the "typical worst day" in the 2003 EIR.

According to preliminary project detail, the material movement estimated for construction of the proposed project is 7,500 CY of cut to be balanced on site, which also is within the scope of the previously identified 10,000 CY analyzed in the 2003 EIR. Additional detail on project-specific construction parameters is included in Attachment B.

Table 3 presents the estimated maximum daily construction emissions generated during construction of the proposed project. Details of the emission calculations are provided in Attachment B.

Table 3. Estimated Maximum Daily Construction Criteria Air Pollutant Emissions

Year	ROG	NOx	CO	SOx	PM_{10}	$PM_{2.5}$
	pounds per day					
2024	1.71	16.21	16.25	0.02	26.22	3.43
2025	24.59	9.29	11.95	0.02	26.18	2.92
Maximum	24.59	16.21	16.25	0.02	26.22	3.43
ICAPCD Threshold	*75*	*100*	*550*	*—*	*150*	*—*
Threshold Exceeded?	**No**	**No**	**No**	**No**	**No**	**No**

Notes: ROG = reactive organic gases; NO_x = oxides of nitrogen; CO = carbon monoxide; SO_x = sulfur oxides; PM_{10} = coarse particulate matter; $PM_{2.5}$ = fine particulate matter; ICAPCD = Imperial County Air Pollution Control District.
See Attachment B for complete results.

As shown in Table 3, proposed project construction would not exceed ICAPCD's daily thresholds. Therefore, construction impacts associated with criteria air pollutant emissions would be **less than significant.**

Operational Emissions

Criteria air pollutant emissions from daily operation of the proposed project were estimated using CalEEMod Version 2022.1.1.18 using a combination of CalEEMod default parameters and project-specific information provided by the applicant, where available. Operational year 2026 was analyzed as it is anticipated to be the first full year of operation following completion of project construction. Criteria air pollutant emissions sources and associated information are discussed below. As discussed previously, mobile sources associated with the Campus Master Plan's FTE enrollment level were previously analyzed in the certified 2003 EIR. Because the proposed project would not increase FTE enrollment beyond the approved Campus Master Plan level, emissions from the proposed project's mobile trips would be consistent with the less than significant impact determination of the 2003 EIR and are not included in the operational analyses.

Area Sources

CalEEMod was used to estimate operational emissions from area sources, including emissions from consumer product use, architectural coatings, and landscape maintenance equipment.

Consumer products are chemically formulated products used by household and institutional consumers, including detergents; cleaning compounds; polishes; floor finishes; cosmetics; personal care products; home, lawn, and garden products; disinfectants; sanitizers; aerosol paints; and automotive specialty products. Other paint products, furniture coatings, or architectural coatings are not considered consumer products (CAPCOA 2022). Consumer product ROG emissions are estimated in CalEEMod based on the floor area of nonresidential buildings and on the default factor of pounds of ROG per building square foot per day.

Landscape maintenance includes fuel combustion emissions from equipment such as lawn mowers, rototillers, shredders/grinders, blowers, trimmers, chain saws, and hedge trimmers. The emissions associated with landscape equipment use are estimated based on CalEEMod default values for emission factors (grams per square foot of nonresidential building space per day) and number of summer days (when landscape maintenance would generally be performed) and winter days (CAPCOA 2022).

Energy

As represented in CalEEMod, energy sources include emissions associated with building electricity and natural gas usage. Electricity use would contribute indirectly to criteria air pollutant emissions; however, the emissions from electricity use are only quantified for GHGs in CalEEMod, since criteria pollutant emissions occur at the site of the power plant, which is typically off site. Per the applicant and consistent with CSU's aim to minimize use of natural gas and transition to electric alternatives, no natural gas would be used on site. All space and water heating will be electrified.

The proposed project would include the installation of a propane tank for the dedicated purpose of supporting lab spaces and other instructional uses. Emissions from daily propane use were calculated in a spreadsheet model using emission factors from the EPA's Compilation of Air Pollutant Emission Factors (AP-42), Section 1.5, *Liquefied Petroleum Gas Combustion,* and project-specific usage data points. Per the applicant, approximately 36 gallons of propane would be used per day.

Stationary

Per preliminary project details, operation of the project would include use of an emergency backup generator. Specifications (i.e., horsepower) for a 150-kW capacity emergency standby generator set were used, with maximum annual usage not to exceed 80 hours. Worst case daily operation of the generator was conservatively calculated to be 24 hours.

Table 4 presents the estimated maximum daily emissions generated during operation of the proposed project. Details of the emission calculations are provided in Attachment B.

Table 4. Estimated Maximum Daily Operations Criteria Air Pollutant Emissions

Source	ROG	NOx	CO	SOx	PM_{10}	$PM_{2.5}$
	pounds per day					
Area	0.93	—	—	—	—	—
Energy	0.04	0.47	0.27	<0.01	0.02	0.01
Stationary	6.54	18.27	23.72	0.03	0.96	0.96
Total	**7.50**	**18.74**	**23.99**	**0.03**	**0.98**	**0.97**
ICAPCD Threshold	*137*	*137*	*550*	*150*	*150*	*550*
Threshold Exceeded?	**No**	**No**	**No**	**No**	**No**	**No**

Notes: ROG = reactive organic gases; NO_x = oxides of nitrogen; CO = carbon monoxide; SO_x = sulfur oxides; PM_{10} = coarse particulate matter; $PM_{2.5}$ = fine particulate matter; ICAPCD = Imperial County Air Pollution Control District.
See Attachment B for complete results.

As shown in Table 4, the project would not exceed ICAPCD's significance thresholds during operations. Therefore, operational impacts associated with criteria air pollutant emissions would be less than significant.

In considering cumulative impacts from the proposed project, the analysis must specifically evaluate a project's contribution to the cumulative increase in pollutants for which the SSAB is designated as nonattainment for the CAAQS and NAAQS. If a project's emissions would exceed ICAPCD's significance thresholds, it would be considered to have a cumulatively considerable contribution to nonattainment status in the SSAB. If a project does not exceed thresholds and is determined to have less than significant project-specific impacts, it may still contribute to a significant cumulative impact on air quality. The basis for analyzing the proposed project's cumulatively considerable contribution is if the project's contribution accounts for a significant proportion of the cumulative total emissions (i.e., it represents a "cumulatively considerable contribution" to the cumulative air quality impact) and consistency with ICAPCD air quality plans, which address cumulative emissions in the SSAB.

The SSAB has been designated as a federal and state nonattainment area for O_3 and PM_{10}. The nonattainment status is the result of cumulative emissions from various sources of air pollutants and their precursors within the SSAB, including motor vehicles, off-road equipment, and commercial and industrial facilities. Construction of the proposed project would generate ROG and NOx emissions (which are precursors to O_3) and emissions of PM_{10} and $PM_{2.5}$. As indicated in Tables 3 and 4, project-generated construction and operational emissions would not exceed ICAPCD's emission-based significance thresholds for any criteria air pollutant.

Cumulative localized impacts would potentially result if a construction project were to occur concurrently with another off-site project. Construction schedules for potential future projects near the proposed project site are currently unknown; therefore, potential construction impacts associated with two or more simultaneous projects would be speculative. However, future projects would be subject to CEQA and would require an air quality analysis and, where necessary, mitigation if the project would exceed ICAPCD's significance thresholds. Criteria air pollutant emissions associated with construction activity of future proposed projects also would be reduced through implementation of control measures required by ICAPCD. Cumulative PM_{10} and $PM_{2.5}$ emissions would be reduced because all future projects would be subject to ICAPCD Regulation VIII (*Fugitive Dust Control Measures*), which sets forth general and specific requirements for all construction sites in the ICAPCD.

Based on the previous considerations, the project would not result in a cumulatively considerable increase in emissions of nonattainment pollutants, and cumulative impacts would be **less than significant.**

c) Would the project expose sensitive receptors to substantial pollutant concentrations?

Sensitive receptors are those individuals more susceptible to the effects of air pollution than the population at large. People most likely to be affected by air pollution include children, the elderly, and people with cardiovascular and chronic respiratory diseases. According to CARB, sensitive receptor locations may include hospitals, schools, and day care centers (CARB 2023). The closest sensitive receptor (i.e., residential dwelling) is approximately 1,400 feet to the west of the project site.

The air quality analysis prepared for the 2003 EIR found that there would be "no significant impact" related to exposure of sensitive receptors to substantial pollutant concentrations. The analysis focused on the use of chemical toxics (i.e., pesticides) associated with adjacent/past agricultural activity and its impact on receptors at the project site. The analysis found that there would be no significant impacts related to pesticide drift, and no mitigation measures were required. The project-specific analysis provided below expands this discussion to include the impact of pollutants generated during construction and operation on sensitive receptors within proximity to the site.

Carbon Monoxide Hotspots

Exposure to high concentrations of CO can result in dizziness, fatigue, chest pain, headaches, and impairment of central nervous system functions. Mobile source impacts, including those related to CO, occur essentially on two scales of motion. Regionally, project-related construction travel would add to regional trip generation and increase the vehicle miles traveled within the local airshed and the SSAB. Locally, construction traffic would be added to the roadway system in the vicinity of the project site. Although the SSAB is currently an attainment area for CO, there is a potential for the formation of microscale CO "hotspots" to occur immediately around points of congested traffic. Hotspots can form if such traffic occurs during periods of poor atmospheric ventilation, is composed of a large number of vehicles cold-started and operating at pollution-inefficient speeds, and/or is operating on roadways crowded with non-project traffic. Because of continued improvement in vehicular emissions at a rate faster than the rate of vehicle growth and/or congestion, the potential for CO hotspots in the SSAB is steadily decreasing.

The proposed project would have trip generation associated with construction worker vehicles and construction vendor trucks. Title 40 of the California Code of Regulations, Section 93.123(c)(5), Procedures for Determining Localized CO, PM_{10}, and $PM_{2.5}$ Concentrations (hot-spot analysis), states that "CO, PM_{10}, and $PM_{2.5}$ hot-spot analyses are not required to consider construction-related activities, which cause temporary increases in emissions. Each site which is affected by construction-related activities shall be considered separately, using established 'Guideline' methods. Temporary increases are defined as those which occur only during the construction phase and last five years or less at any individual site" (40 CFR 93.123). Accordingly, while proposed project construction would involve on-road vehicle trips from trucks and workers during construction, construction activities would last approximately 19 months and would not require a project-level construction hotspot analysis. As such, potential project-generated impacts associated with CO hotspots would be **less than significant.**

Toxic Air Contaminants

Toxic air contaminants (TACs) are defined as substances that may cause or contribute to an increase in deaths or in serious illness, or that may pose a present or potential hazard to human health. Health effects from carcinogenic air toxics are usually described in terms of cancer risk, with a recommended an incremental threshold of 10 in 1 million. "Incremental cancer risk" is the net increased likelihood that a person continuously exposed to concentrations of TACs resulting from a project over a 9-, 30-, and 70-year exposure period will contract cancer based on the use of standard Office of Environmental Health Hazard Assessment risk-assessment methodology (OEHHA 2015). In addition, some TACs have non-carcinogenic effects, which are evaluated using a Hazard Index of 1 or more for acute (short-term) and chronic (long-term) non-carcinogenic effects (OEHHA 2015). The greatest potential for TAC emissions during construction would be diesel particulate matter (DPM) emissions from heavy equipment use.

DPM has established cancer risk factors and relative exposure values for long-term chronic health hazard impacts; however, no short-term, acute relative exposure level has been established for DPM. Total project construction would last approximately 19 months, after which construction-related TAC emissions would cease. According to the Office of Environmental Health Hazard Assessment, health risk assessments (which determine the exposure of sensitive receptors to toxic emissions) should be based on a 30-year exposure period for the maximally exposed individual receptor; however, such assessments should also be limited to the period/duration of activities associated with the project. A 19-month construction schedule represents a short duration of exposure (5% of a 30-year exposure period), while cancer and chronic risk from DPM are typically associated with long-term exposure.

Exhaust PM_{10} is typically used as a surrogate for DPM, and as shown in Table 3, which presents total PM_{10} from fugitive dust and exhaust, project-generated construction PM_{10} emissions are anticipated to be minimal, and well below the ICAPCD threshold. In addition, sensitive receptors are located approximately 1,400 feet from the active project construction areas, which would reduce exposure to TACs as TAC emission dispersion increases with distance. Due to the relatively short period of construction activity and minimal DPM emissions on site, TACs generated during construction would not be expected to result in concentrations causing significant health risks. In addition, the proposed project would be required to comply with the following measures, which are required by state law to reduce diesel particulate emissions:

- Fleet owners of mobile construction equipment are subject to the CARB Regulation for In-Use Off-Road Diesel Vehicles (Title 13 California Code of Regulations, Chapter 9, Section 2449), the purpose of which is to reduce DPM and criteria pollutant emissions from in-use (existing) off-road diesel-fueled vehicles.
- All commercial diesel vehicles are subject to Title 13, Section 2485 of the California Code of Regulations, limiting engine idling time. Idling of heavy-duty diesel construction equipment and trucks during loading and unloading shall be limited to 5 minutes; electric auxiliary power units should be used whenever possible.

During operation, the project would include minimal sources of TAC emissions, including use of a diesel-powered emergency generator. Given the minor increase in emissions and distance to the closest receptor (i.e., approximately 1,400 feet), operational activities are not expected to be a significant source of DPM or associated potential health impacts.

Given the relatively brief construction period and the nature of proposed project operations, implementation of the proposed project is not anticipated to expose sensitive receptors to substantial DPM concentrations and impacts would be **less than significant**.

Health Impacts of Criteria Air Pollutants

The SSAB is designated as nonattainment for O_3 for the NAAQS and CAAQS. Thus, existing O_3 levels in the SSAB are at unhealthy levels during certain periods. The health effects associated with O_3 generally relate to reduced lung function. Because the proposed project would not involve construction activities that would result in O_3 precursor emissions (ROG or NOx) that would exceed the ICAPCD thresholds, the project is not anticipated to substantially contribute to regional O_3 concentrations and associated health impacts. Similar to construction, no ICAPCD threshold would be exceeded during operation.

In addition to O_3, NOx emissions contribute to potential exceedances of the NAAQS and CAAQS for NO_2 (since NO_2 is a constituent of NOx). Exposure to NO_2 can cause lung irritation, bronchitis, and pneumonia, and lower resistance to respiratory infections. As depicted in Tables 3 and 4, proposed project construction and operation would not exceed the ICAPCD localized thresholds for NOx. Thus, construction and operation of the proposed project are not expected to exceed the NO_2 standards or contribute to associated health effects.

CO tends to be a localized impact associated with congested intersections. CO competes with oxygen, often replacing it in the blood, reducing the blood's ability to transport oxygen to vital organs. The results of excess CO exposure can include dizziness, fatigue, and impairment of central nervous system functions. CO hotspots were discussed previously as a less than significant impact. Thus, the proposed project's CO emissions would not contribute to the health effects associated with this pollutant.

The SSAB also is designated as nonattainment for PM_{10} under the NAAQS and CAAQS. Particulate matter contains microscopic solids or liquid droplets that are so small that they can get deep into the lungs and cause serious health problems. Particulate matter exposure has been linked to a variety of problems, including premature death in people with heart or lung disease, nonfatal heart attacks, irregular heartbeat, aggravated asthma, decreased lung function, and increased respiratory symptoms such as irritation of the airways, coughing, or difficulty breathing (US Environmental Protection Agency [EPA] 2016). As with O_3 and NOx, the proposed project would not generate emissions of PM_{10} or $PM_{2.5}$ that would exceed ICAPCD thresholds. Accordingly, the proposed project's PM_{10} and $PM_{2.5}$ emissions are not expected to cause any increase in related regional health effects for these pollutants.

In summary, the proposed project would not result in any potentially significant contribution to local or regional concentrations of nonattainment pollutants and would not result in a significant contribution to the adverse health impacts associated with those pollutants. Impacts would be **less than significant**.

d) Would the project result in other emissions (such as those leading to odors) adversely affecting a substantial number of people?

The occurrence and severity of potential odor impacts depends on numerous factors. The nature, frequency, and intensity of the source; the wind speeds and direction; and the sensitivity of receiving location each contribute to the intensity of the impact. Although offensive odors seldom cause physical harm, they can be annoying and cause distress among the public and generate citizen complaints.

The Initial Study (IS) prepared for the 2003 EIR found that there would be "no impact" related to objectionable odors affecting a substantial number of people. Given that the proposed project's construction and operational activities are within the scope of what was previously analyzed in the certified 2003 EIR, the proposed project remains consistent with and encompassed by that determination. A discussion of odors specific to the proposed project is provided below for additional context.

Construction

Odors would be potentially generated from vehicles and equipment exhaust emissions during construction of the proposed project. Potential odors produced during construction would be attributable to concentrations of unburned hydrocarbons from tailpipes of construction equipment and architectural coatings. Such odors would be temporary, disperse rapidly from the proposed project site, and generally occur at magnitudes that would not affect substantial numbers of people. Therefore, impacts associated with odors during construction would be **less than significant.**

Operation

Land uses and industrial operations that are potential sources of odor include wastewater treatment plants, sanitary landfills, composting stations, feedlots, asphalt plants, painting/coating operations, and rendering plants (ICAPCD 2017). In addition to the odor source, the distance between the sensitive receptor(s) and the odor source, as well as the local meteorological conditions, are considerations in the potential for a project to frequently expose the public to objectionable odors. Although localized air quality impacts are focused on potential impacts to sensitive receptors, such as residences and schools, other land uses where people may congregate (e.g., workplaces) or uses with the intent to attract people (e.g., restaurants and visitor-serving accommodations) should also be considered in the evaluation of potential odor nuisance impacts. The proposed project would include education facilities development consistent with the land uses analyzed in the certified 2003 EIR, which is not expected to produce any nuisance odors; therefore, impacts related to odors caused by the proposed project during operations would be **less than significant.**

5 Greenhouse Gas Emissions Assessment

Greenhouse gases (GHG) are those that absorb infrared radiation (i.e., trap heat) in the Earth's atmosphere. The trapping and buildup of heat in the atmosphere near the Earth's surface (the troposphere), is referred to as the "greenhouse effect", and is a natural process that contributes to the regulation of the Earth's temperature, creating a livable environment on Earth. The Earth's temperature depends on the balance between energy entering and leaving the planet's system, and many factors (natural and human) can cause changes in Earth's energy balance. Human activities that generate and emit GHGs to the atmosphere increase the amount of infrared radiation that gets absorbed before escaping into space, thus enhancing the greenhouse effect and causing the Earth's surface temperature to rise. This rise in temperature has led to large-scale changes to the Earth's system (e.g., temperature, precipitation, wind patterns, etc.), which are collectively referred to as climate change. Global climate change is a cumulative impact; a project contributes to this impact through its incremental contribution combined with the cumulative increase of all other sources of GHGs. Thus, GHG impacts are recognized exclusively as cumulative impacts (CAPCOA 2008).

As defined in California Health and Safety Code Section 38505(g) for purposes of administering many of the state's primary GHG emissions reduction programs, GHGs include CO_2, methane (CH_4), nitrous oxide (N_2O), hydrofluorocarbons, perfluorocarbons, sulfur hexafluoride, and nitrogen trifluoride (see also CEQA Guidelines Section 15364.5). The primary GHGs that would be emitted by project-related construction and operations include CO2, CH_4, and N2O.

The Intergovernmental Panel on Climate Change developed the global warming potential (GWP) concept to compare each GHG's ability to trap heat in the atmosphere relative to another gas. The reference gas used is CO_2; therefore, GWP-weighted emissions are measured in metric tons (MT) of CO_2 equivalent (CO_2e). Consistent with CalEEMod Version 2022.1.1.18, this GHG emissions analysis utilizes the following GWPs: 25 for CH_4 (i.e., emissions of 1 MT of CH_4 are equivalent to emissions of 25 MT of CO_2), and 298 for N_2O, based on the Intergovernmental Panel on Climate Change's Fourth Assessment Report (IPCC 2007).

GHG emissions associated with construction of the proposed project were estimated for the following emission sources: operation of off-road construction equipment, on-road vendor trucks, and worker vehicles. GHG emission sources associated with operation of the proposed project include area, energy, mobile, solid waste, water, and wastewater categories. The detailed proposed project construction and operational modeling parameters are included in Attachment B, *Air Quality and Greenhouse Gas Emissions CalEEMod Output Files.*

5.1 Greenhouse Gas Impact Analysis and Conclusions

5.1.1 Thresholds of Significance

The significance criteria used to evaluate the proposed project's GHG emissions impacts are based on the recommendations provided in Appendix G of the CEQA Guidelines. For the purposes of this GHG emissions analysis, the proposed project would have a significant environmental impact if it would (14 CCR 15000 et seq.):

a) Generate GHG emissions, either directly or indirectly, that may have a significant impact on the environment?
b) Conflict with an applicable plan, policy, or regulation adopted for the purpose of reducing the emissions of GHGs?

The CEQA Guidelines do not prescribe specific methodologies for performing an assessment, do not establish specific thresholds of significance, and do not mandate specific mitigation measures. Rather, the CEQA Guidelines emphasize the lead agency's discretion to determine the appropriate methodologies and thresholds of significance consistent with the manner in which other impact areas are handled in CEQA (CNRA 2009). The State of California has not adopted emission-based thresholds for GHG emissions under CEQA. The Governor's Office of Planning and Research's Technical Advisory, titled Discussion Draft CEQA and Climate Change Advisory (OPR 2018), states the following:

> [N]either the CEQA statute nor the CEQA Guidelines prescribe thresholds of significance or particular methodologies for performing an impact analysis. This is left to lead agency judgment and discretion, based upon factual data and guidance from regulatory agencies and other sources where available and applicable. Even in the absence of clearly defined thresholds for GHG emissions, such emissions must be disclosed and mitigated to the extent feasible whenever the lead agency determines that the project contributes to a significant, cumulative climate change impact.

Furthermore, the advisory document indicates that "in the absence of regulatory standards for GHG emissions or other scientific data to clearly define what constitutes a 'significant impact,' individual lead agencies may undertake a project-by-project analysis, consistent with available guidance and current CEQA practice." Section 15064.7(c) of the CEQA Guidelines specifies that "when adopting thresholds of significance, a lead agency may consider thresholds of significance previously adopted or recommended by other public agencies, or recommended by experts, provided the decision of the lead agency to adopt such thresholds is supported by substantial evidence."

Neither CSU/SDSU nor the ICAPCD has adopted a numeric significance threshold for determining significant impacts associated with project-level GHG emissions. Therefore, in the absence of guidance from these agencies, the significance analysis for the proposed project's GHG emissions relies on guidance from the neighboring South Coast Air Quality Management District (SCAQMD), as described below.

In October 2008, SCAQMD staff published numeric CEQA significance thresholds for lead agencies to use in assessing GHG impacts of residential and commercial development projects, as presented in its Draft Guidance Document—Interim CEQA Greenhouse Gas (GHG) Significance Threshold (SCAQMD 2008). This document, which built upon the California Air Pollution Control Officers Association's previous guidance, explored various approaches for establishing a significance threshold for GHG emissions. The draft interim CEQA thresholds guidance document was not adopted or approved by the SCAQMD Governing Board. However, in December 2008, the SCAQMD Governing Board adopted an interim 10,000 MT CO_2e per-year screening level threshold for stationary source/industrial projects for which the SCAQMD is the lead agency (SCAQMD 2010). The 10,000 MT CO_2e per-year threshold, which was derived from GHG reduction targets established in Executive Order S-3-05, was based on the conclusion that the threshold was consistent with achieving an emissions capture rate of 90% of all new or modified stationary source projects.

SCAQMD also formed a GHG CEQA Significance Threshold Working Group to work with its staff on developing GHG CEQA significance thresholds. From December 2008 to September 2010, SCAQMD staff hosted working group meetings and revised its 2008 draft threshold proposal several times, although it did not officially provide these proposals in a subsequent document. The most recent proposal issued by SCAQMD, issued in September 2010, uses the following tiered approach to evaluate potential GHG impacts from various uses (SCAQMD 2010):

Tier 1. Determine if CEQA categorical exemptions are applicable. If not, move to Tier 2.

Tier 2. Consider whether or not the proposed project is consistent with a locally adopted GHG reduction plan that has gone through public hearing and CEQA review, that has an approved inventory, includes monitoring, etc. If not, move to Tier 3.

Tier 3. Consider whether the project generates GHG emissions in excess of screening thresholds for individual land uses. The 10,000 MT CO_2e per-year threshold for industrial uses would be recommended for use by all lead agencies. Under option 1, separate screening thresholds are proposed for residential projects (3,500 MT CO_2e per year), commercial projects (1,400 MT CO_2e per year), and mixed-use projects (3,000 MT CO_2e per year). Under option 2, a single numerical screening threshold of 3,000 MT CO_2e per year would be used for all non-industrial projects. If the project generates emissions in excess of the applicable screening threshold, move to Tier 4.

Tier 4. Consider whether the project generates GHG emissions in excess of applicable performance standards for the project service population (population plus employment). The efficiency targets were established based on the goal of Assembly Bill (AB) 32 to reduce statewide GHG emissions to 1990 levels by 2020. The 2020 efficiency targets are 4.8 MT CO_2e per-service population for project-level analyses and 6.6 MT CO_2e per-service population for plan-level analyses. If the project generates emissions in excess of the applicable efficiency targets, move to Tier 5.

Tier 5. Consider the implementation of CEQA mitigation (including the purchase of GHG offsets) to reduce the project efficiency target to Tier 4 levels.

Section 15064.7(c) of the CEQA Guidelines specifies that "[w]hen adopting thresholds of significance, a lead agency may consider thresholds of significance previously adopted or recommended by other public agencies, or recommended by experts, provided the decision of the lead agency to adopt such thresholds is supported by substantial evidence." 'Therefore, to determine the proposed project's potential to generate GHG emissions that would have a significant impact on the environment, its GHG emissions were compared to SCAQMD's 3,000 MT CO_2e per year screening threshold recommended for non-industrial projects. Per the SCAQMD guidance, construction emissions should be amortized over the operational life of the proposed project, which is assumed to be 30 years (SCAQMD 2008a). This impact analysis, therefore, adds amortized construction emissions to the estimated annual operational emissions and then compares operational emissions to the proposed SCAQMD threshold of 3,000 MT CO2e per year.

5.1.2 Impact Analysis

As discussed in Section 3, Analysis Methodology, at the time the 2003 EIR was certified, an evaluation of GHG emissions was not required under CEQA. Therefore, the impacts of project-related construction and operational GHG emissions was not previously considered. Pursuant to CEQA Guidelines Section 15168(c)(1), an analysis of the proposed project's GHG emissions has been prepared as described below.

a) Would the project generate greenhouse gas emissions either directly or indirectly that may have a significant impact on the environment?

Construction Emissions

CalEEMod was used to calculate the construction GHG emissions based on the construction scenario described in Section 4, Air Quality Assessment. Construction of the project is anticipated to commence in January 2024 and would last approximately 19 months, ending in September 2025. On-site sources of GHG emissions include off-road equipment and off-site sources include vendor trucks and worker vehicles. Additional details are provided in Attachment B, *Air Quality and Greenhouse Gas Emissions CalEEMod Output Files.*

Table 5 presents construction emissions for the project from on-site and off-site emission sources.

Table 5. Estimated Annual Construction Greenhouse Gas Emissions

Year	CO_2	CH_4	N_2O	R	CO_2e
	Metric Tons per Year				
2024	266	0.01	0.01	0.07	269
2025	165	0.01	<0.01	0.05	166
Total	**431.25**	**0.02**	**0.01**	**0.12**	**434.63**
				Amortized (30-year project life)	*14*

Notes: CO_2 = carbon dioxide; CH_4 = methane; N_2O = nitrous oxide; R= refrigerants; CO_2e = carbon dioxide equivalent
See Attachment B for complete results.
Totals may not add due to rounding.

Operational Emissions

Once operational, the proposed project would result in GHG emissions from energy use, solid waste, water use, wastewater generation, refrigerants, and stationary sources (i.e., the emergency generator). As with construction, GHG emissions from proposed project operations were estimated using CalEEMod based on a combination of project-specific detail provided by the applicant and default parameters, where necessary. All details for operational criteria air pollutants discussed in Section 4, Air Quality Assessment, are also applicable for the estimation of operations-related GHG emissions. As such, see Section 4, Air Quality Assessment, for a discussion of the operational emissions calculation methodology. Additional information for GHG-specific emissions sources are discussed in the following sections.

As noted above, the previously approved FTE student enrollment would not increase with the proposed project above what was already analyzed in the certified 2003 EIR for the approved Campus Master Plan. As such, given that the allowable FTE growth was approved as part of the Campus Master Plan and analyzed in the certified 2003 EIR, the scope of this analysis does not include impacts from the related mobile trips. Therefore, only GHG emissions related to the proposed project's building envelope and site footprint (e.g., energy, solid waste, water) were included in the operational emissions analysis. For additional details see Attachment B, *Air Quality and Greenhouse Gas Emissions CalEEMod Output Files.*

Energy

The estimation of operational energy emissions was based on CalEEMod land use defaults and units or total area (i.e., square footage) of the proposed project land use (i.e., University/College). For nonresidential buildings, CalEEMod energy intensity value (electricity or natural gas usage per square foot per year) parameters are based on the California Commercial End-Use Survey database. Emissions are calculated by multiplying the energy use by the utility carbon intensity (pounds of GHGs per kilowatt-hour for electricity or 1,000 British thermal units for natural gas) for CO_2 and other GHGs.

Consistent with CSU's aim to minimize use of natural gas and transition to electric alternatives, no natural gas would be used on site, and all space and water heating will be electrified. Electrifying uses at the site would reduce GHG emissions associated with project operations by converting a portion of the project's forecasted natural gas consumption to electricity. To estimate emissions associated with the elimination of natural gas, use of natural gas during operation of the project was set at 0 kBTU/year in CalEEMod. Electricity consumption (i.e., kWh/year) was adjusted based on the relative efficiency per source of energy use (e.g., efficiency of powering water heaters with electricity versus natural gas). Energy use efficiency data were obtained from the U.S. Energy Information Administration and U.S. Department of Energy, as appropriate. For further details, see Attachment B, *Air Quality and Greenhouse Gas Emissions CalEEMod Output Files*.

Annual electricity emissions were estimated in CalEEMod using the emissions factors for Imperial Irrigation District, which would be the electricity provider for the project. CalEEMod default energy intensity factors (CO_2, CH_4, and N_2O mass emissions per kilowatt-hour) for Imperial Irrigation District are based on the forecasted factors for the operational year. Per the project applicant, the solar photovoltaic (PV) systems installed at the site would provide approximately 54 kW of renewable power.

As discussed previously, a propane tank would be provided on site for the dedicated purpose of supporting lab spaces and other instructional uses. Emissions from annual propane use were calculated in a spreadsheet model using emission factors from the EPA's Compilation of Air Pollutant Emission Factors (AP-42), Section 1.5, *Liquefied Petroleum Gas Combustion,* and project-specific usage data points. Approximately 7,600 gallons of propane would be used per year at the site, based on information provided by the applicant.

Water and Wastewater

Supply, conveyance, treatment, and distribution of water for the proposed project requires the use of electricity, which would result in associated indirect GHG emissions. Similarly, wastewater generated by the proposed project requires the use of electricity for conveyance and treatment, along with GHG emissions generated during wastewater treatment (i.e., biological processes). Water consumption estimates for both indoor and outdoor water use and associated electricity consumption from water use and wastewater generation were estimated using CalEEMod default values.

Refrigerants

Refrigerants are substances used in equipment for air conditioning and refrigeration. Most of the refrigerants used today are HFCs or blends thereof, which can have high GWP values. All equipment that uses refrigerants has a charge size (i.e., quantity of refrigerant the equipment contains), an operational refrigerant leak rate, and a GWP specific to the type of refrigerant. GHG emissions related to refrigerant leaks from operation of the proposed project were estimated using CalEEMod default parameters. CalEEMod quantifies refrigerant emissions from leaks during regular operation and routine servicing over the equipment lifetime, and derives average annual emissions from the lifetime estimate.

Solid Waste

The proposed project would generate solid waste, resulting in CO_2e emissions associated with landfill off-gassing. CalEEMod default values for solid waste generation for the proposed land use were used to estimate GHG emissions associated with solid waste.

Table 6 presents the estimated annual GHG emissions generated during operation of the proposed project. The emissions results presented reflect operational year 2026, as it is anticipated to be the first full year of operation following completion of project construction. Details of the emission calculations are provided in Attachment B, *Air Quality and Greenhouse Gas Emissions CalEEMod Output Files*.

Table 6. Estimated Annual Operational Greenhouse Gas Emissions

Emission Source	CO_2	CH_4	N_2O	R	CO_2e
	Metric Tons per Year				
Energy	174.78	0.02	0.01	<0.01	176.73
Water Use	2.67	0.06	<0.01	<0.01	4.58
Solid Waste	13.84	1.38	<0.01	<0.01	48.43
Refrigerants	<0.01	<0.01	<0.01	0.02	0.02

Stationary Sources	5.06	<0.01	<0.01	<0.01	5.07
Total Annual Operational Emissions	**196.35**	**1.46**	**0.01**	**0.02**	**234.84**
				Amortized 30-year Construction Emissions	14
				Total Annual Project Emissions	**249**
				SCAQMD Threshold	3,000
				Threshold Exceeded?	**No**

Notes: CO_2 = carbon dioxide; CH_4 = methane; N_2O = nitrous oxide; R= refrigerants; CO_2e = carbon dioxide equivalent
See Attachment B for complete results.
The values shown are the annual emissions reflect California Emissions Estimator Model "mitigated" output.
Totals may not add due to rounding.

As shown in Table 6, the estimated total GHG emissions during operation of the proposed project would be approximately 249 MT CO_2e per year, including amortized construction emissions. The proposed project would not exceed the SCAQMD threshold of 3,000 MT CO_2e per year. Projects below this significance criterion have a minimal contribution to global emissions and are considered to have less than significant impacts. Therefore, operational impacts associated with directly or indirectly generating a significant quantity of GHG emissions would be **less than significant.**

Of note, it is likely that emissions estimated here are well below what would have been estimated had GHG emissions been analyzed in the 2003 EIR. Since 2003, the State of California has enacted a comprehensive suite of laws to increase efficiencies and thereby reduce GHG emissions associated with water use, solid waste disposal, and building energy use. Accordingly, construction and operation of the proposed project benefits from the current landscape, which serves to reduce GHG emissions as compared to what was in place in 2003.

b) Would the project conflict with an applicable plan, policy, or regulation adopted for the purpose of reducing the emissions of GHGs.

The proposed project would not conflict with any applicable plan, policy, or regulation adopted for the purpose of reducing GHG emissions, and impacts would be **less than significant.** Applicable plans for the proposed project site include the California State University Sustainability Policy, as most recently revised in May 2022; the 2017 Climate Action Plan for San Diego State University (CAP); and CARB's Scoping Plan. Each of these plans is described below along with an analysis of the proposed project's potential to conflict with the related GHG emission reduction goals.

Potential to Conflict with the California State University Sustainability Policy

The CSU Board of Trustees adopted its first systemwide Sustainability Policy in May 2014, and most recently revised the Sustainability Policy in May 2022. The Sustainability Policy was developed to integrate sustainability into all facets of the CSU, including academics, facilities operations, built environment, and student life. The Sustainability Policy focuses mainly on energy and GHG emissions, and largely aligns with the State of California's energy and GHG emissions reduction goals (CSU 2022). It aims to reduce the environmental impact of construction and operation of buildings and to integrate sustainability across the curriculum through 11 broad policies, including: University Sustainability; Climate Action Plan; Energy Resilience and Procurement; Energy Conservation, Carbon Reduction, and Utility Management; Water

Conservation; Sustainable Procurement; Waste Management; Sustainable Food Service; Sustainable Building & Lands Practices; Physical Plant Management; and Transportation.

The proposed project would comply with all relevant requirements of the CSU Sustainability Policy. For example, the project shall incorporate on-site solar PV; meet or exceed the minimum requirements equivalent to LEED Silver; and, exceed the applicable energy codes and regulations (i.e., California Code of Regulations, Title 24, Part 6 [Building Energy Efficiency Standards]) by ten percent. Additionally, no natural gas would be used on site, and all space and water heating would be electrified, which is consistent with CSU's aim to minimize use of natural gas and transition to electric alternatives.

Potential to Conflict with the 2017 Climate Action Plan for San Diego State University

The SDSU CAP was adopted in May 2017 to provide goals and strategies to achieve carbon neutrality and improve sustainability efforts campus-wide. The CAP includes results of a baseline emissions inventory that summarizes GHG emissions from campus operations in 2015 and projected emissions to future years to inform development of appropriate reduction strategies. While the SDSU CAP does include goals and strategies that would result in a reduction of GHG emissions at the proposed project site, the SDSU CAP is not considered qualified per CEQA Guidelines Section 15183.5. Additionally, the CAP was prepared with focus on the SDSU main campus location in La Mesa. Therefore, inclusion of this plan is for informational purposes only.

Emissions sources in the CAP's baseline inventory and emissions projections include energy use, solid waste, water use, and student and faculty/staff commute (i.e., mobile source emissions) associated with activity at SDSU's main campus in La Mesa. Overall, emissions from energy use and mobile sources accounted for the majority of GHG emissions in the baseline inventory, and therefore present the greatest opportunity for future GHG emissions reductions. As previously discussed, the previously approved FTE student enrollment would not increase with the proposed project above what was already analyzed in the certified 2003 EIR for the approved Campus Master Plan. As such, given that the allowable FTE growth was approved as part of the Campus Master Plan and analyzed in the certified 2003 EIR, the scope of this analysis does not include impacts from the related mobile trips. Therefore, only strategies related to the proposed project's building envelope and site footprint (e.g., energy, solid waste, water) would be applicable to this analysis.

The CAP vision for energy highlights a shift from natural gas-based co-generation toward grid energy and on-site renewables. For solid waste, the CAP aims to encourage recycling and move toward zero-waste in the future. The CAP's vision for water use is to encourage efficient landscaping (e.g., drought-resistant and native species, limited turf, and efficient irrigation systems), and ensure ultra-low flow and high-performance fixtures are used for potable systems.

Consistent with this vision, the project will contain no natural gas, and all space and water heating will be electrified. The proposed project would also exceed the Title 24 Building Energy Efficiency Standards by at least ten percent and will meet or exceed the minimum requirements equivalent to LEED Silver consistent with the CSU Sustainability Policy, reducing overall energy demand and consumption. Additionally, the proposed project includes on-site solar capable of generating approximately 54 kW of renewable power, which equates to accommodating approximately 8.6% of the proposed project's total annual electricity demand.

As such, the proposed project would support the vision of and not conflict with the overall goal of the SDSU CAP. Specifically, the proposed project's incorporation of on-site solar and elimination of natural gas supports SDSU's goal to achieve carbon neutrality through increased energy efficiency and reliance on renewable energy alternatives for campus operations.

Potential to Conflict with CARB's Scoping Plan

The California State Legislature passed the Global Warming Solutions Act of 2006 (Assembly Bill 32 [AB 32]) to provide initial direction to limit California's GHG emissions to 1990 levels by 2020 and initiate the state's long-range climate objectives. Since the passage of AB 32, the State has adopted GHG emissions reduction targets for future years beyond the initial 2020 horizon year. For the proposed project, the relevant GHG emissions reduction targets include those established by Senate Bill 32 (SB 32) and AB 1279, which require GHG emissions be reduced to 40% below 1990 levels by 2030, and 85% below 1990 levels by 2045, respectively. In addition, AB 1279 calls upon the state to achieve net zero GHG emissions by no later than 2045 and achieve and maintain net negative GHG emissions thereafter.

As defined by AB 32, the California Air Resources Board (CARB) is required to develop the Scoping Plan, which provides the framework for actions to achieve the state's GHG emission targets. The Scoping Plan is required to be updated every five years and requires CARB and other state agencies to adopt regulations and initiatives that will reduce GHG emissions statewide. The first Scoping Plan was adopted in 2008, with subsequent updates adopted in 2014, 2017, and (most recently) 2022. While the Scoping Plan is not directly applicable to specific projects, it does provide the official framework for the measures and regulations that will be pursued by the State's executive branch of government to reduce California's GHG emissions in alignment with the legislatively-adopted targets. Therefore, a project would be found to not conflict with the statutes establishing statewide GHG reduction targets if it would meet the Scoping Plan policies and would not impede attainment of the goals therein.

CARB's 2017 Scoping Plan was the first to address the state's strategy for achieving the 2030 GHG reduction target set forth in SB 32 (CARB 2017). The most recent 2022 Scoping Plan outlines the state's plan to reduce emissions and achieve carbon neutrality by 2045 in alignment with AB 1279, and assesses the state's progress towards meeting the 2030 SB 32 target (CARB 2022). As such, given that SB 32 and AB 1279 are the relevant GHG emission targets, the 2017 and 2022 Scoping Plans that outline the strategy to achieve those targets are the most applicable to the proposed project.

To achieve the 2030 goal of 40 percent below 1990 GHG emission levels, the 2017 Scoping Plan included measures to promote renewable energy and energy efficiency (including the mandates of SB 350), measures to increase the stringency of the Low Carbon Fuel Standard (LCFS), measures identified in the Mobile Source and Freight Strategies, measures identified in the proposed Short-Lived Climate Pollutant Plan, and measures to increase the stringency of SB 375 targets. To fill the gap in additional reductions needed to achieve the 2030 target, the 2017 Scoping Plan also recommended continuing the Cap-and-Trade Program and a measure to reduce GHGs from refineries by 20%. Many of these measures and programs would result in the reduction of project-related GHG emissions with no action required at the project-level. These programs would benefit GHG emission reductions through increased energy efficiency and renewable energy production (SB 350), reduction in carbon intensity of transportation fuels (LCFS), and the accelerated efficiency and electrification of the statewide vehicle fleet (Mobile Source Strategy). Implementation of these statewide programs would result in a reduction of operational GHG emissions over the project lifetime.

CARB approved the 2022 Scoping Plan in December 2022 to outline the state's plan to reduce anthropogenic emissions to 85% below 1990 levels by 2045 and achieve carbon neutrality by 2045 or earlier. The 2022 Scoping Plan also assesses the progress the state is making towards reducing GHG emissions by at least 40% below 1990 levels by 2030, as is required by SB 32 and laid out in the 2017 Scoping Plan. The carbon reduction programs included in the 2022 Scoping Plan build on and accelerate those currently in place, including moving to zero-emission transportation; phasing out use of fossil gas use for heating homes and buildings; reducing chemical and refrigerants with high GWP; providing communities with sustainable options for walking, biking, and public transit; and displacement of fossil-fuel fired electrical generation through use of renewable energy alternatives (e.g., solar arrays and wind turbines) (CARB 2022c). Implementation of the measures and programs included in the 2022 Scoping Plan largely are the responsibility of policymakers and would result in the reduction of project-related GHG emissions with no action required at the project-level. Given that the proposed project would be fully electric (i.e., no natural gas consumption) and includes on-site solar capable of accommodating approximately 8.6% of the proposed project's total annual electrical demand, implementation would support the 2022 Scoping Plan's goals of displacing fossil-fuel fired electrical generation through use of renewable alternatives.

The 2045 carbon neutrality goal required CARB to expand proposed actions in the 2022 Scoping Plan to include those that capture and store carbon in addition to those that reduce only anthropogenic sources of GHG emissions. The proposed project would support the state's carbon neutrality goals, as implementation would increase renewable, carbon-free electricity sources within the state, decreasing reliance on fossil fuels. While transitioning to renewable alternatives will support the state's overall climate goals, the 2022 Scoping Plan also indicates that achieving carbon neutrality will require research, development, and deployment of additional methods to capture atmospheric GHG emissions (e.g., mechanical direct air capture). Given that the specific path to neutrality will require development of technologies and programs that are not currently known or available, the project's role in supporting the statewide goal would be speculative and cannot be wholly identified at this time.

Overall, the proposed project would comply will all regulations adopted in furtherance of the Scoping Plan to the extent applicable and required by law. As mentioned above, several Scoping Plan measures would result in reductions of project-related GHG emissions with no action required at the project-level, including those related to energy efficiency, reduced fossil fuel use, and renewable energy production. As demonstrated above, the proposed project would not conflict with CARB's 2017 or 2022 Scoping Plan updates and with the state's ability to achieve the 2030 and 2045 GHG reduction and carbon neutrality goals. Further, the proposed project's consistency with the applicable measures and programs would assist in meeting the County's contribution to GHG emission reduction targets in California.

6 Energy Assessment

Project implementation would result in energy use for construction and operation, including use of electricity and petroleum-based fuels. The electricity and petroleum used for construction of the proposed project would be temporary, would be substantially less than that required for project operation, and would have a negligible contribution to the project's overall energy consumption.

The proposed project's impact on energy resources is discussed separately below for construction and operation. Energy consumption (electricity and petroleum consumption) was estimated using CalEEMod data from the air quality and GHG assessment, which was based on modeling inputs developed in consultation with the project applicant, as well as default parameters where necessary. For further detail on the modeling parameters and results of the energy analysis, please refer to the Attachment B, *Air Quality and Greenhouse Gas Emissions CalEEMod Output Files.*

6.1 Energy Impact Analysis and Conclusions

6.1.1 Thresholds of Significance

The significance criteria used to evaluate the proposed project's energy impacts are based on the recommendations provided in Appendix G of the CEQA Guidelines. For the purposes of this energy analysis, the proposed project would have a significant environmental impact if it would (14 CCR 15000 et seq.):

a) Result in a potentially significant environmental impact due to wasteful, inefficient, or unnecessary consumption of energy resources during project construction or operation?
b) Conflict with or obstruct a state or local plan for renewable energy or energy efficiency?

6.1.2 Impact Analysis

As discussed in Section 3, Analysis Methodology, at the time the 2003 EIR was certified, an evaluation of energy was not required under CEQA. Pursuant to CEQA Guidelines Section 15168(c)(1), an analysis of the proposed project's energy impacts relating to construction and operation of the proposed sciences building has been prepared as described below.

a) Would the project result in a potentially significant environmental impact due to wasteful, inefficient, or unnecessary consumption of energy resources during project construction or operation.

Implementation of the proposed project would result in energy use for construction and operation, including use of electricity, propane, and other petroleum-based fuels. The electricity and fuel used for construction of the proposed project would be temporary, would be substantially less than that required for project operation, and would have a negligible contribution to the project's overall energy consumption. Additionally, although electricity usage at the campus would increase due to the implementation of the project, the project's energy efficiency would exceed the current Building Energy Efficiency Standards (Title 24) in accordance with the CSU Sustainability Policy. Further, while the project would see an increase in petroleum use during construction and operation, vehicles would use less petroleum due to advances in fuel economy and potential reduction in vehicle miles traveled (VMT) over time.

The proposed project's impact related to energy resources is discussed separately below for construction and operation. Energy consumption (electricity and petroleum consumption) was estimated using CalEEMod data from the air quality and GHG assessment. For further detail on the modeling parameters and results of the energy analysis, please refer to the Attachment B, *Air Quality and Greenhouse Gas Emissions CalEEMod Output Files.*

Construction Energy Use

Electricity

Electricity consumed during project construction would vary throughout the construction period based on the construction activities being performed. Various construction activities would require electricity, including the conveyance of water that would be used for dust control (supply and conveyance) and electricity to power any necessary lighting during construction, electronic equipment, or other construction activities necessitating electrical power. Such electricity demand would be temporary, nominal, and would cease upon the completion of construction. Imperial Irrigation District is the electricity provider to the project site and provided approximately 3,520 Gigawatt-hours of electricity in 2021 (California Energy Commission [CEC] 2023a). Overall, construction activities associated with the proposed project would require limited electricity consumption that would not be expected to have an adverse impact on available Imperial Irrigation District electricity supplies and infrastructure. Therefore, the use of electricity during project construction would not be wasteful, inefficient, or unnecessary.

Petroleum-Based Fuels

Petroleum-based fuel usage represents most energy consumed during construction. Petroleum fuels would be used to power off-road construction vehicles and equipment on the project site, construction worker travel to and from the project site, as well as construction material delivery truck trips.

Fuel consumption from construction equipment and vehicles was estimated by converting the total carbon dioxide (CO_2) emissions from each construction phase to gallons using the conversion factors for CO_2 to gallons of gasoline or diesel. All off-road equipment and vendor trucks are anticipated to use diesel fuel, while worker vehicles are analyzed based upon gasoline fuel use. Construction is estimated to last approximately 19 months beginning in January 2024. The conversion factor for gasoline is 8.78 kilograms per metric ton CO_2 per gallon, and the conversion factor for diesel is 10.21 kilograms per metric ton CO_2 per gallon (The Climate Registry 2021). The estimated diesel fuel usage from construction of the proposed project is shown in Table 7.

Table 7. Estimated Construction Fuel Use

Construction Year	Off-Road Equipment	On-Road Trucks	On-Road Workers
	Fuel Use (gallons)		
2024	21,325	2,245	2,944
2025	13,055	1,436	1,914
Total	**34,379**	**3,681**	**4,858**

Notes:
See Attachment B for complete results.
Totals may not add due to rounding.

As shown in Table 7, construction of the proposed project is anticipated to require 4,858 gallons of gasoline and 38,060 gallons of diesel over the 19-month construction period. The proposed project would be required to comply with the CARB's Airborne Toxics Control Measure, which restricts heavy-duty diesel vehicle idling time to 5 minutes. The proposed project would also be subject to CARB's In-Use Off-Road Diesel Vehicle Regulation that requires the vehicle fleet to reduce emissions by retiring, replacing, repowering older engines, or installing Verified Diesel Emissions Control Strategies. Furthermore, earthwork at the project site would be balanced, which supports efficiency during construction given that overall truck trips would be minimized. Therefore, impacts associated with construction energy use would be **less than significant.**

Operations Energy Use

Electricity

The proposed project would require electricity for multiple purposes at buildout, including cooling, lighting, appliances, etc. Additionally, the supply, conveyance, treatment, and distribution of water would indirectly result in electricity usage. Electricity consumption associated with project operation is based on the CalEEMod outputs presented in Attachment B, *Air Quality and Greenhouse Gas Emissions CalEEMod Output Files*.

CalEEMod default values for energy consumption for the proposed project were applied for the project analysis. The energy use from non-residential land uses is calculated in CalEEMod based on the California Commercial End-Use Survey database. Energy use in buildings is divided by the program into end-use categories subject to Title 24 requirements (end-uses associated with the building envelope, such as the HVAC system, water heating system, and integrated lighting) and those not subject to Title 24 requirements (such as appliances, electronics, and miscellaneous "plug-in" uses).

Total annual electricity demand associated with proposed project operation would be approximately 1,106,361 kWh/year. As mentioned previously, the 54-kW on-site PV solar system is expected to accommodate approximately 8.6% of the proposed project's total annual electrical demand, for a net electrical demand of 1,009,742 kWh/year required from the grid. For context, in 2021, California used approximately 280 billion kilowatt-hours of electricity (CEC 2023b). Locally, in 2021, non-residential electricity demand in Imperial County was approximately 0.84 billion kilowatt-hours (CEC 2023b).

Title 24 of the California Code of Regulations serves to enhance and regulate California's building standards. The most recent amendments to Title 24, Part 6, referred to as the 2022 standards, became effective on January 1, 2023. As discussed in Section 5.1.2 above, the proposed project would exceed the Title 24 Building Energy Efficiency Standards by at least ten percent in compliance with the CSU Sustainability Policy. Exceedance of the applicable Title 24 standards would reduce overall energy consumption of the proposed project and would ensure that the energy demands would not be inefficient, wasteful, or otherwise unnecessary, and the project's effect on electrical demands during operation would be **less than significant.**

Natural Gas

Consistent with CSU's aim to minimize use of natural gas and transition to electric alternatives, operation of the proposed project would be fully electric and would not require natural gas. As such, there would be no impact to natural gas related supply and infrastructure capacity and the project's effect on natural gas demands during operation would be **less than significant.**

Petroleum

During operation, fuel consumption resulting from the project would involve the use of landscaping equipment and use of the emergency generator. Additionally, a propane tank would be provided on site for the dedicated purpose of supporting lab spaces and other instructional uses. As discussed previously, the proposed project would not increase the Campus Master Plan's approved 850 FTE student enrollment. Given that the allowable FTE growth was analyzed in the certified 2003 EIR and approved as a component of the Campus Master Plan, the scope of this analysis does not include impacts from the related mobile trips, including their petroleum use.

Annual petroleum use from operation of landscaping equipment and the emergency generator would be approximately 495 gallons per year. Petroleum consumption from propane use during operation would be approximately 7,600 gallons per year. By comparison, California as a whole consumed approximately 22 billion gallons of petroleum in 2020 (U.S. Energy Information Administration [EIA] 2023) and in 2021 the County consumed approximately 74 million gallons of gasoline, and 27 million gallons of diesel (CEC 2022). As such, petroleum demand required for implementation of the proposed project is relatively insignificant and would not be inefficient, wasteful, or otherwise unnecessary. The project's effect on petroleum supply during operation would be **less than significant.**

In summary, implementation of the project would increase the demand for electricity and petroleum in the region during construction and operation. However, because the project would implement all current, applicable regulations and policies, the project would not be wasteful, inefficient, and would not result in unnecessary energy resource consumption. Relatedly, since the proposed project would comply with and exceed the Title 24 energy conservation standards pursuant to the CSU Sustainability Policy, the proposed project would not result in the wasteful, inefficient, or unnecessary consumption of energy. Moreover, on-site PV solar is expected to accommodate approximately 8.6% of the proposed project's electrical demand during operations. Therefore, impacts would be **less than significant.**

Of note, and consistent with the discussion of GHG emissions impact above (see Section 5.1.2, Greenhouse Gas Emissions Assessment Impact Analysis), it is likely that energy use estimated here is well below what would have been estimated had energy been analyzed in the 2003 EIR. Since 2003, the State of California has enacted a comprehensive suite of laws to increase efficiencies and thereby reduce energy use associated with water use, solid waste disposal, and building energy use, among others. Accordingly, construction and operation of the proposed project benefits from the current legal landscape, which serves to reduce energy demand as compared to what was in place in 2003.

b) Would the project conflict with or obstruct a state or local plan for renewable energy or energy efficiency.

The proposed project would not conflict with or obstruct a state or local plan for renewable energy or energy efficiency. At a minimum, the proposed project would be subject to and would comply with the 2022 California Building Code Title 24 (24 CCR, Part 6). Additionally, as discussed in Section 5.1.2, the proposed project would not conflict with CSU's Sustainability Policy or the SDSU CAP, which was adopted in 2017 to achieve carbon neutrality, in part, through goals and strategies that support increased energy efficiency and transition to renewable energy alternatives campus-wide. Specifically, no natural gas would be used on site, and all space and water heating would be electrified, which is consistent with CSU's aim to minimize use of natural gas and transition to electric alternatives.

The proposed project would also not conflict with CARB's Climate Change Scoping Plan, which identifies several strategies to reduce GHG emissions through energy efficiency. As discussed in further detail in Section 5.1.2, the proposed project would be subject to these strategies as many are state actions requiring no additional involvement at the project level. As such, implementation of the proposed project would not conflict with applicable plans for energy efficiency, and the impacts during construction and operation would be **less than significant**.

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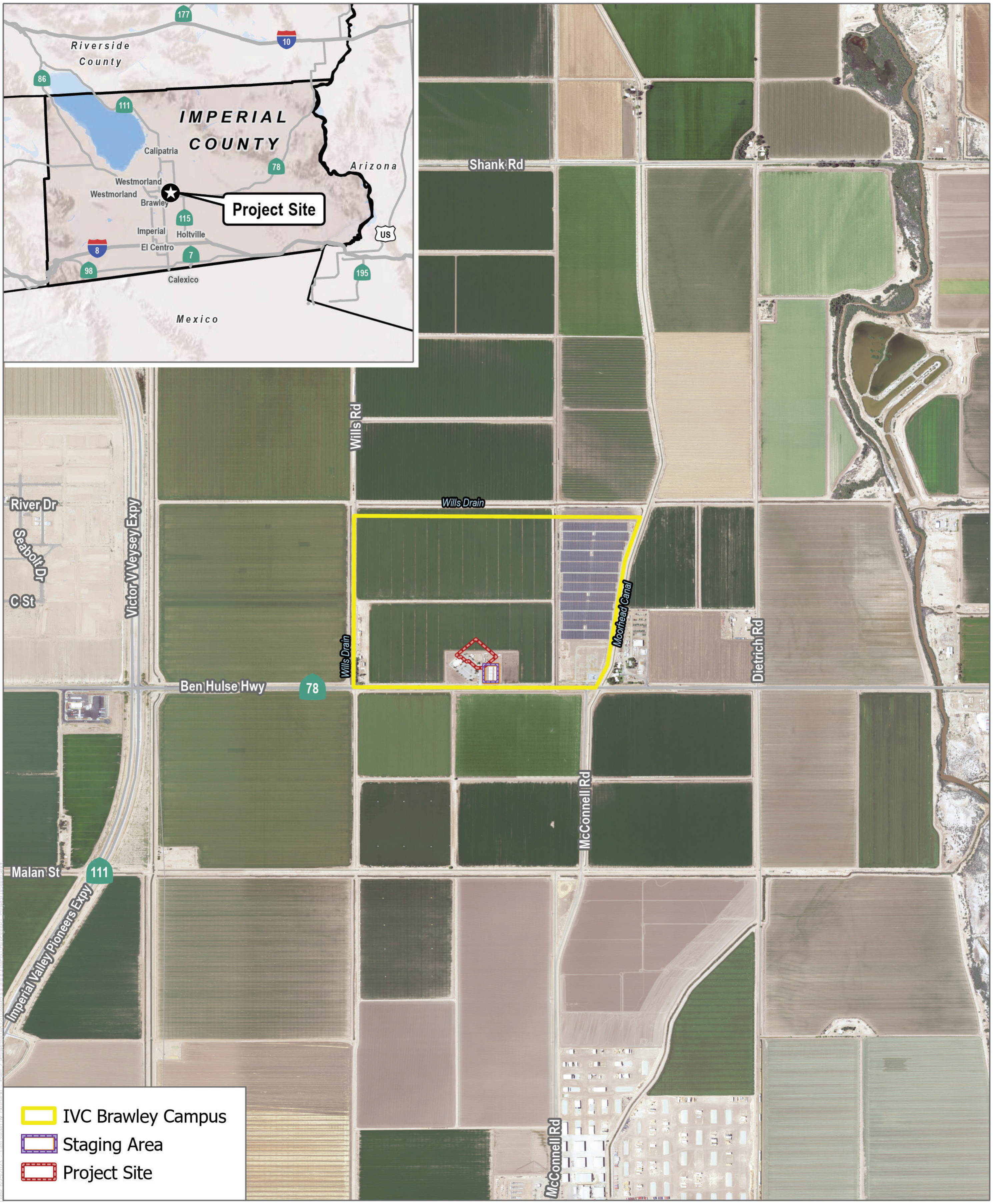
Attachment A

Figures



SOURCE: NAIP 2020, Open Streets Map 2019

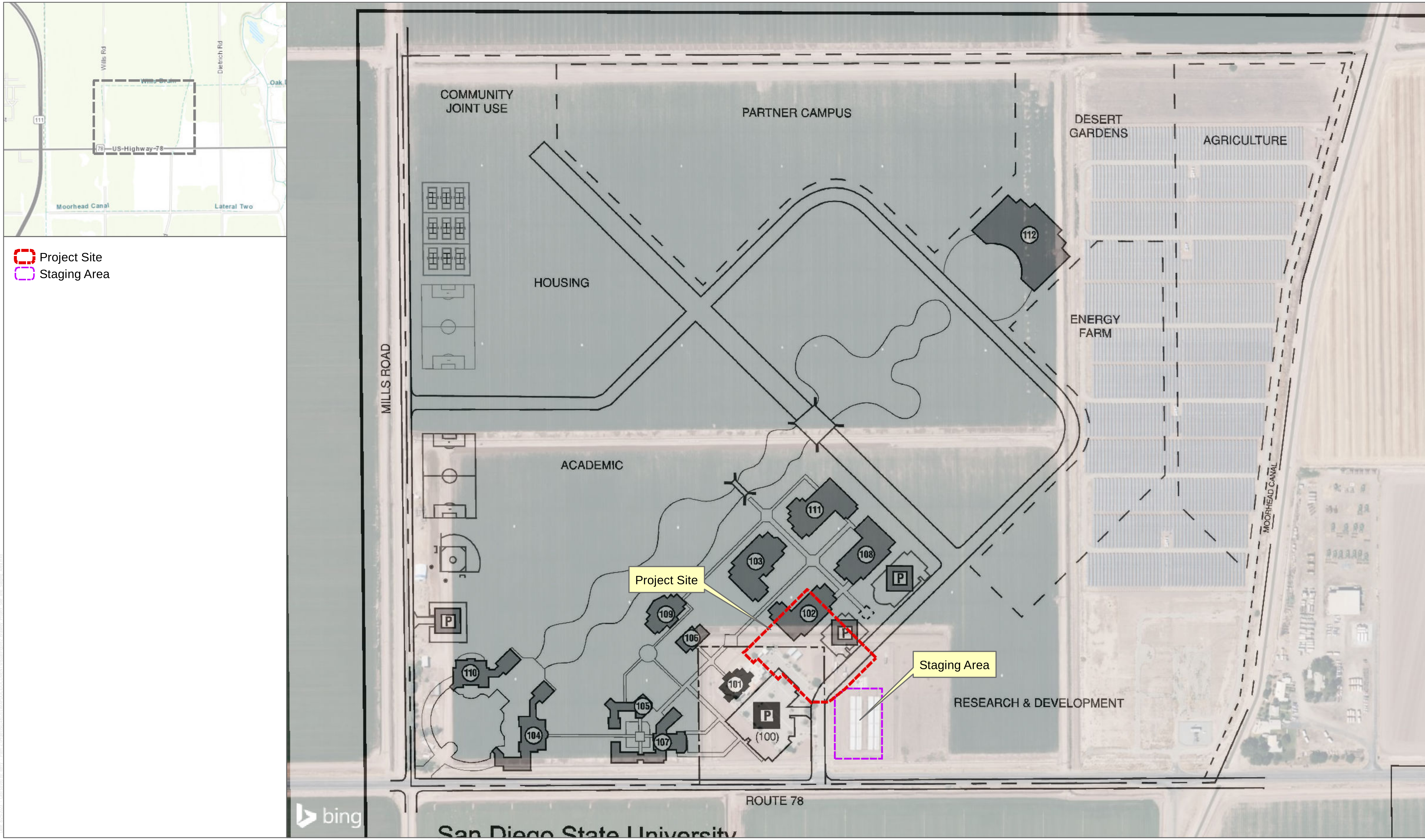
DUDEK

0 1,000 2,000 Feet

FIGURE 1

Regional/Campus Location

SDSU Brawley Sciences Building Project



SOURCE: AERIAL-BING MAPPING SERVICE 2022; CAMPUS MASTER PLAN 2003

DUDEK

0 175 350 Feet

FIGURE 2

SDSU Brawley Project Site and Staging Area

SDSU Brawley Sciences Building Project

Attachment B

Air Quality and Greenhouse Gas Emissions
CalEEMod Output Files

SDSU Brawley Construction_August Updates Detailed Report

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8. User Changes to Default Data

1. Basic Project Information

1.1. Basic Project Information

Data Field	Value
Project Name	SDSU Brawley Construction_August Updates
Construction Start Date	1/1/2024
Lead Agency	—
Land Use Scale	Project/site
Analysis Level for Defaults	County
Windspeed (m/s)	3.40
Precipitation (days)	4.80
Location	32.9802660660003, -115.48384214183959
County	Imperial
City	Unincorporated
Air District	Imperial County APCD
Air Basin	Salton Sea
TAZ	5601
EDFZ	19
Electric Utility	Imperial Irrigation District
Gas Utility	Southern California Gas
App Version	2022.1.1.18

1.2. Land Use Types

Land Use Subtype	Size	Unit	Lot Acreage	Building Area (sq ft)	Landscape Area (sq ft)	Special Landscape Area (sq ft)	Population	Description
University/College (4yr)	850	Student	1.50	36,900	61,119	61,119	—	—

1.3. User-Selected Emission Reduction Measures by Emissions Sector

No measures selected

2. Emissions Summary

2.1. Construction Emissions Compared Against Thresholds

Criteria Pollutants (lb/day for daily, ton/yr for annual) and GHGs (lb/day for daily, MT/yr for annual)

Un/Mit.	TOG	ROG	NOx	CO	SO2	PM10E	PM10D	PM10T	PM2.5E	PM2.5D	PM2.5T	BCO2	NBCO2	CO2T	CH4	N2O	R	CO2e
Daily, Summer (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Unmit.	1.50	24.6	9.77	12.2	0.02	0.37	25.8	26.2	0.34	2.61	2.96	—	2,237	2,237	0.08	0.05	1.44	2,256
Daily, Winter (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Unmit.	2.04	1.71	16.2	16.3	0.02	0.75	25.8	26.2	0.69	2.74	3.43	—	2,779	2,779	0.11	0.05	0.04	2,797
Average Daily (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Unmit.	1.08	1.93	7.27	8.51	0.02	0.28	18.1	18.4	0.26	1.85	2.11	—	1,610	1,610	0.06	0.04	0.44	1,622
Annual (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Unmit.	0.20	0.35	1.33	1.55	< 0.005	0.05	3.30	3.35	0.05	0.34	0.39	—	266	266	0.01	0.01	0.07	269

2.2. Construction Emissions by Year, Unmitigated

Criteria Pollutants (lb/day for daily, ton/yr for annual) and GHGs (lb/day for daily, MT/yr for annual)

Year	TOG	ROG	NOx	CO	SO2	PM10E	PM10D	PM10T	PM2.5E	PM2.5D	PM2.5T	BCO2	NBCO2	CO2T	CH4	N2O	R	CO2e
Daily - Summer (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—

2024	1.50	1.25	9.77	12.2	0.02	0.37	25.8	26.2	0.34	2.61	2.96	—	2,237	2,237	0.08	0.05	1.44	2,256
2025	1.41	24.6	9.25	11.9	0.02	0.33	25.8	26.2	0.30	2.61	2.92	—	2,229	2,229	0.08	0.05	1.36	2,247
Daily - Winter (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
2024	2.04	1.71	16.2	16.3	0.02	0.75	25.8	26.2	0.69	2.74	3.43	—	2,779	2,779	0.11	0.05	0.04	2,797
2025	1.38	1.15	9.29	11.2	0.02	0.33	25.8	26.2	0.30	2.61	2.92	—	2,192	2,192	0.09	0.05	0.04	2,208
Average Daily	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
2024	1.08	0.90	7.27	8.51	0.02	0.28	18.1	18.4	0.26	1.85	2.11	—	1,610	1,610	0.06	0.04	0.44	1,622
2025	0.62	1.93	4.15	5.22	0.01	0.15	12.0	12.1	0.14	1.21	1.35	—	995	995	0.04	0.02	0.28	1,003
Annual	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
2024	0.20	0.17	1.33	1.55	< 0.005	0.05	3.30	3.35	0.05	0.34	0.39	—	266	266	0.01	0.01	0.07	269
2025	0.11	0.35	0.76	0.95	< 0.005	0.03	2.18	2.21	0.03	0.22	0.25	—	165	165	0.01	< 0.005	0.05	166

3. Construction Emissions Details

3.1. Site Preparation (2024) - Unmitigated

Criteria Pollutants (lb/day for daily, ton/yr for annual) and GHGs (lb/day for daily, MT/yr for annual)

Location	TOG	ROG	NOx	CO	SO2	PM10E	PM10D	PM10T	PM2.5E	PM2.5D	PM2.5T	BCO2	NBCO2	CO2T	CH4	N2O	R	CO2e
Onsite	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Daily, Summer (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Daily, Winter (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Off-Road Equipment	1.70	1.43	13.7	12.9	0.02	0.65	—	0.65	0.59	—	0.59	—	2,064	2,064	0.08	0.02	—	2,071

Dust From Material Movement	—	—	—	—	—	—	1.63	1.63	—	0.78	0.78	—	—	—	—	—	—	—
Onsite truck	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00	—
Average Daily	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Off-Road Equipment	0.02	0.02	0.19	0.18	< 0.005	0.01	—	0.01	0.01	—	0.01	—	28.3	28.3	< 0.005	< 0.005	—	28.4
Dust From Material Movement	—	—	—	—	—	—	0.02	0.02	—	0.01	0.01	—	—	—	—	—	—	—
Onsite truck	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00	—
Annual	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Off-Road Equipment	< 0.005	< 0.005	0.03	0.03	< 0.005	< 0.005	—	< 0.005	< 0.005	—	< 0.005	—	4.68	4.68	< 0.005	< 0.005	—	4.70
Dust From Material Movement	—	—	—	—	—	—	< 0.005	< 0.005	—	< 0.005	< 0.005	—	—	—	—	—	—	—
Onsite truck	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00	—
Offsite	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Daily, Summer (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Daily, Winter (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Worker	0.05	0.04	0.06	0.54	0.00	0.00	10.3	10.3	0.00	1.04	1.04	—	99.7	99.7	0.01	< 0.005	0.01	—
Vendor	0.01	0.01	0.24	0.11	< 0.005	< 0.005	4.55	4.56	< 0.005	0.46	0.47	—	193	193	< 0.005	0.03	0.01	—
Hauling	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00	—

Average Daily	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Worker	< 0.005	< 0.005	< 0.005	0.01	0.00	0.00	0.14	0.14	0.00	0.01	0.01	—	1.47	1.47	< 0.005	< 0.005	< 0.005	—
Vendor	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	0.06	0.06	< 0.005	0.01	0.01	—	2.64	2.64	< 0.005	< 0.005	< 0.005	—
Hauling	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00	—
Annual	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Worker	< 0.005	< 0.005	< 0.005	< 0.005	0.00	0.00	0.03	0.03	0.00	< 0.005	< 0.005	—	0.24	0.24	< 0.005	< 0.005	< 0.005	—
Vendor	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	0.01	0.01	< 0.005	< 0.005	< 0.005	—	0.44	0.44	< 0.005	< 0.005	< 0.005	—
Hauling	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00	—

3.3. Grading (2024) - Unmitigated

Criteria Pollutants (lb/day for daily, ton/yr for annual) and GHGs (lb/day for daily, MT/yr for annual)

Location	TOG	ROG	NOx	CO	SO2	PM10E	PM10D	PM10T	PM2.5E	PM2.5D	PM2.5T	BCO2	NBCO2	CO2T	CH4	N2O	R	CO2e
Onsite	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Daily, Summer (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Daily, Winter (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Off-Road Equipment	1.96	1.65	15.9	15.4	0.02	0.74	—	0.74	0.68	—	0.68	—	2,454	2,454	0.10	0.02	—	2,462
Dust From Material Movement	—	—	—	—	—	—	1.84	1.84	—	0.89	0.89	—	—	—	—	—	—	—
Onsite truck	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00	—
Average Daily	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Off-Road Equipment	0.05	0.04	0.39	0.38	< 0.005	0.02	—	0.02	0.02	—	0.02	—	60.5	60.5	< 0.005	< 0.005	—	60.7

Dust From Material Movement	—	—	—	—	—	—	0.05	0.05	—	0.02	0.02	—	—	—	—	—	—	—
Onsite truck	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00	—
Annual	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Off-Road Equipment	0.01	0.01	0.07	0.07	< 0.005	< 0.005	—	< 0.005	< 0.005	—	< 0.005	—	10.0	10.0	< 0.005	< 0.005	—	10.1
Dust From Material Movement	—	—	—	—	—	—	0.01	0.01	—	< 0.005	< 0.005	—	—	—	—	—	—	—
Onsite truck	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00	—
Offsite	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Daily, Summer (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Daily, Winter (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Worker	0.06	0.05	0.08	0.72	0.00	0.00	13.7	13.7	0.00	1.39	1.39	—	133	133	0.01	< 0.005	0.02	—
Vendor	0.01	0.01	0.24	0.11	< 0.005	< 0.005	4.55	4.56	< 0.005	0.46	0.47	—	193	193	< 0.005	0.03	0.01	—
Hauling	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00	—
Average Daily	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Worker	< 0.005	< 0.005	< 0.005	0.02	0.00	0.00	0.33	0.33	0.00	0.03	0.03	—	3.52	3.52	< 0.005	< 0.005	0.01	—
Vendor	< 0.005	< 0.005	0.01	< 0.005	< 0.005	< 0.005	0.11	0.11	< 0.005	0.01	0.01	—	4.75	4.75	< 0.005	< 0.005	0.01	—
Hauling	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00	—
Annual	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Worker	< 0.005	< 0.005	< 0.005	< 0.005	0.00	0.00	0.06	0.06	0.00	0.01	0.01	—	0.58	0.58	< 0.005	< 0.005	< 0.005	—
Vendor	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	0.02	0.02	< 0.005	< 0.005	< 0.005	—	0.79	0.79	< 0.005	< 0.005	< 0.005	—

Hauling	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00	—

3.5. Building Construction (2024) - Unmitigated

Criteria Pollutants (lb/day for daily, ton/yr for annual) and GHGs (lb/day for daily, MT/yr for annual)

Location	TOG	ROG	NOx	CO	SO2	PM10E	PM10D	PM10T	PM2.5E	PM2.5D	PM2.5T	BCO2	NBCO2	CO2T	CH4	N2O	R	CO2e
Onsite	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Daily, Summer (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Off-Road Equipment	1.36	1.13	9.44	10.1	0.02	0.37	—	0.37	0.34	—	0.34	—	1,801	1,801	0.07	0.01	—	1,807
Onsite truck	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00	—
Daily, Winter (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Off-Road Equipment	1.36	1.13	9.44	10.1	0.02	0.37	—	0.37	0.34	—	0.34	—	1,801	1,801	0.07	0.01	—	1,807
Onsite truck	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00	—
Average Daily	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Off-Road Equipment	0.93	0.77	6.43	6.88	0.01	0.25	—	0.25	0.23	—	0.23	—	1,227	1,227	0.05	0.01	—	1,231
Onsite truck	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00	—
Annual	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Off-Road Equipment	0.17	0.14	1.17	1.26	< 0.005	0.05	—	0.05	0.04	—	0.04	—	203	203	0.01	< 0.005	—	204
Onsite truck	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00	—
Offsite	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—

Daily, Summer (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Worker	0.13	0.11	0.11	1.98	0.00	0.00	21.3	21.3	0.00	2.15	2.15	—	244	244	0.01	0.01	0.91	—
Vendor	0.01	0.01	0.22	0.11	< 0.005	< 0.005	4.55	4.56	< 0.005	0.46	0.47	—	192	192	< 0.005	0.03	0.52	—
Hauling	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00	—
Daily, Winter (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Worker	0.10	0.08	0.13	1.12	0.00	0.00	21.3	21.3	0.00	2.15	2.15	—	206	206	0.01	0.01	0.02	—
Vendor	0.01	0.01	0.24	0.11	< 0.005	< 0.005	4.55	4.56	< 0.005	0.46	0.47	—	193	193	< 0.005	0.03	0.01	—
Hauling	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00	—
Average Daily	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Worker	0.07	0.07	0.08	0.96	0.00	0.00	14.3	14.3	0.00	1.45	1.45	—	151	151	0.01	0.01	0.27	—
Vendor	0.01	< 0.005	0.16	0.07	< 0.005	< 0.005	3.06	3.06	< 0.005	0.31	0.31	—	131	131	< 0.005	0.02	0.15	—
Hauling	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00	—
Annual	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Worker	0.01	0.01	0.02	0.18	0.00	0.00	2.61	2.61	0.00	0.26	0.26	—	25.0	25.0	< 0.005	< 0.005	0.04	—
Vendor	< 0.005	< 0.005	0.03	0.01	< 0.005	< 0.005	0.56	0.56	< 0.005	0.06	0.06	—	21.7	21.7	< 0.005	< 0.005	0.03	—
Hauling	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00	—

3.7. Building Construction (2025) - Unmitigated

Criteria Pollutants (lb/day for daily, ton/yr for annual) and GHGs (lb/day for daily, MT/yr for annual)

Location	TOG	ROG	NOx	CO	SO2	PM10E	PM10D	PM10T	PM2.5E	PM2.5D	PM2.5T	BCO2	NBCO2	CO2T	CH4	N2O	R	CO2e
Onsite	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Daily, Summer (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—

Off-Road Equipment	1.28	1.07	8.95	10.0	0.02	0.33	—	0.33	0.30	—	0.30	—	1,801	1,801	0.07	0.01	—	1,807
Onsite truck	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00	—
Daily, Winter (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Off-Road Equipment	1.28	1.07	8.95	10.0	0.02	0.33	—	0.33	0.30	—	0.30	—	1,801	1,801	0.07	0.01	—	1,807
Onsite truck	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00	—
Average Daily	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Off-Road Equipment	0.53	0.44	3.68	4.12	0.01	0.13	—	0.13	0.12	—	0.12	—	740	740	0.03	0.01	—	743
Onsite truck	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00	—
Annual	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Off-Road Equipment	0.10	0.08	0.67	0.75	< 0.005	0.02	—	0.02	0.02	—	0.02	—	123	123	< 0.005	< 0.005	—	123
Onsite truck	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00	—
Offsite	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Daily, Summer (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Worker	0.12	0.10	0.10	1.82	0.00	0.00	21.3	21.3	0.00	2.15	2.15	—	239	239	0.01	0.01	0.84	—
Vendor	0.01	0.01	0.21	0.10	< 0.005	< 0.005	4.55	4.56	< 0.005	0.46	0.47	—	189	189	< 0.005	0.03	0.52	—
Hauling	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00	—
Daily, Winter (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Worker	0.09	0.08	0.11	1.03	0.00	0.00	21.3	21.3	0.00	2.15	2.15	—	202	202	0.01	0.01	0.02	—

Vendor	0.01	0.01	0.23	0.10	< 0.005	< 0.005	4.55	4.56	< 0.005	0.46	0.47	—	189	189	< 0.005	0.03	0.01	—
Hauling	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00	—
Average Daily	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Worker	0.04	0.04	0.04	0.53	0.00	0.00	8.64	8.64	0.00	0.87	0.87	—	89.1	89.1	< 0.005	< 0.005	0.15	—
Vendor	< 0.005	< 0.005	0.09	0.04	< 0.005	< 0.005	1.85	1.85	< 0.005	0.19	0.19	—	77.6	77.6	< 0.005	0.01	0.09	—
Hauling	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00	—
Annual	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Worker	0.01	0.01	0.01	0.10	0.00	0.00	1.58	1.58	0.00	0.16	0.16	—	14.8	14.8	< 0.005	< 0.005	0.02	—
Vendor	< 0.005	< 0.005	0.02	0.01	< 0.005	< 0.005	0.34	0.34	< 0.005	0.03	0.03	—	12.9	12.9	< 0.005	< 0.005	0.02	—
Hauling	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00	—

3.9. Paving (2025) - Unmitigated

Criteria Pollutants (lb/day for daily, ton/yr for annual) and GHGs (lb/day for daily, MT/yr for annual)

Location	TOG	ROG	NOx	CO	SO2	PM10E	PM10D	PM10T	PM2.5E	PM2.5D	PM2.5T	BCO2	NBCO2	CO2T	CH4	N2O	R	CO2e
Onsite	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Daily, Summer (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Off-Road Equipment	0.59	0.49	4.63	6.50	0.01	0.20	—	0.20	0.19	—	0.19	—	992	992	0.04	0.01	—	995
Paving	—	0.12	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Onsite truck	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00	—
Daily, Winter (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Average Daily	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—

Off-Road Equipment	0.03	0.03	0.27	0.37	< 0.005	0.01	—	0.01	0.01	—	0.01	—	57.1	57.1	< 0.005	< 0.005	—	57.3
Paving	—	0.01	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Onsite truck	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00	—
Annual	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Off-Road Equipment	0.01	0.01	0.05	0.07	< 0.005	< 0.005	—	< 0.005	< 0.005	—	< 0.005	—	9.45	9.45	< 0.005	< 0.005	—	9.48
Paving	—	< 0.005	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Onsite truck	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00	—
Offsite	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Daily, Summer (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Worker	0.09	0.08	0.08	1.47	0.00	0.00	17.2	17.2	0.00	1.73	1.73	—	193	193	0.01	0.01	0.68	—
Vendor	0.01	0.01	0.21	0.10	< 0.005	< 0.005	4.55	4.56	< 0.005	0.46	0.47	—	189	189	< 0.005	0.03	0.52	—
Hauling	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00	—
Daily, Winter (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Average Daily	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Worker	< 0.005	< 0.005	< 0.005	0.06	0.00	0.00	0.98	0.98	0.00	0.10	0.10	—	10.1	10.1	< 0.005	< 0.005	0.02	—
Vendor	< 0.005	< 0.005	0.01	0.01	< 0.005	< 0.005	0.26	0.26	< 0.005	0.03	0.03	—	10.9	10.9	< 0.005	< 0.005	0.01	—
Hauling	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00	—
Annual	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Worker	< 0.005	< 0.005	< 0.005	0.01	0.00	0.00	0.18	0.18	0.00	0.02	0.02	—	1.67	1.67	< 0.005	< 0.005	< 0.005	—
Vendor	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	0.05	0.05	< 0.005	< 0.005	< 0.005	—	1.80	1.80	< 0.005	< 0.005	< 0.005	—
Hauling	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00	—

3.11. Architectural Coating (2025) - Unmitigated

Criteria Pollutants (lb/day for daily, ton/yr for annual) and GHGs (lb/day for daily, MT/yr for annual)

Location	TOG	ROG	NOx	CO	SO2	PM10E	PM10D	PM10T	PM2.5E	PM2.5D	PM2.5T	BCO2	NBCO2	CO2T	CH4	N2O	R	CO2e
Onsite	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Daily, Summer (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Off-Road Equipment	0.15	0.13	0.88	1.14	< 0.005	0.03	—	0.03	0.03	—	0.03	—	134	134	0.01	< 0.005	—	134
Architectural Coatings	—	24.4	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Onsite truck	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00	—
Daily, Winter (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Average Daily	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Off-Road Equipment	0.01	0.01	0.05	0.07	< 0.005	< 0.005	—	< 0.005	< 0.005	—	< 0.005	—	7.68	7.68	< 0.005	< 0.005	—	7.71
Architectural Coatings	—	1.41	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Onsite truck	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00	—
Annual	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Off-Road Equipment	< 0.005	< 0.005	0.01	0.01	< 0.005	< 0.005	—	< 0.005	< 0.005	—	< 0.005	—	1.27	1.27	< 0.005	< 0.005	—	1.28
Architectural Coatings	—	0.26	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—

Onsite truck	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00	—
Offsite	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Daily, Summer (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Worker	0.02	0.02	0.02	0.36	0.00	0.00	4.26	4.26	0.00	0.43	0.43	—	47.7	47.7	< 0.005	< 0.005	0.17	—
Vendor	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00	—
Hauling	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00	—
Daily, Winter (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Average Daily	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Worker	< 0.005	< 0.005	< 0.005	0.01	0.00	0.00	0.24	0.24	0.00	0.02	0.02	—	2.50	2.50	< 0.005	< 0.005	< 0.005	—
Vendor	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00	—
Hauling	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00	—
Annual	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Worker	< 0.005	< 0.005	< 0.005	< 0.005	0.00	0.00	0.04	0.04	0.00	< 0.005	< 0.005	—	0.41	0.41	< 0.005	< 0.005	< 0.005	—
Vendor	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00	—
Hauling	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00	—

4. Operations Emissions Details

4.10. Soil Carbon Accumulation By Vegetation Type

4.10.1. Soil Carbon Accumulation By Vegetation Type - Unmitigated

Criteria Pollutants (lb/day for daily, ton/yr for annual) and GHGs (lb/day for daily, MT/yr for annual)

Vegetation	TOG	ROG	NOx	CO	SO2	PM10E	PM10D	PM10T	PM2.5E	PM2.5D	PM2.5T	BCO2	NBCO2	CO2T	CH4	N2O	R	CO2e

Daily, Summer (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Total	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Daily, Winter (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Total	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Annual	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Total	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—

4.10.2. Above and Belowground Carbon Accumulation by Land Use Type - Unmitigated

Criteria Pollutants (lb/day for daily, ton/yr for annual) and GHGs (lb/day for daily, MT/yr for annual)

Land Use	TOG	ROG	NOx	CO	SO2	PM10E	PM10D	PM10T	PM2.5E	PM2.5D	PM2.5T	BCO2	NBCO2	CO2T	CH4	N2O	R	CO2e
Daily, Summer (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Total	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Daily, Winter (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Total	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Annual	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Total	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—

4.10.3. Avoided and Sequestered Emissions by Species - Unmitigated

Criteria Pollutants (lb/day for daily, ton/yr for annual) and GHGs (lb/day for daily, MT/yr for annual)

Species	TOG	ROG	NOx	CO	SO2	PM10E	PM10D	PM10T	PM2.5E	PM2.5D	PM2.5T	BCO2	NBCO2	CO2T	CH4	N2O	R	CO2e

Daily, Summer (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Avoided	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Subtotal	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Sequestered	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Subtotal	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Removed	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Subtotal	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Daily, Winter (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Avoided	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Subtotal	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Sequestered	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Subtotal	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Removed	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Subtotal	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Annual	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Avoided	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Subtotal	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Sequestered	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Subtotal	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—

Removed	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Subtotal	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—

5. Activity Data

5.1. Construction Schedule

Phase Name	Phase Type	Start Date	End Date	Days Per Week	Work Days per Phase	Phase Description
Site Preparation	Site Preparation	1/1/2024	1/5/2024	5.00	5.00	—
Grading	Grading	1/8/2024	1/18/2024	5.00	9.00	—
Building Construction	Building Construction	1/19/2024	7/29/2025	5.00	398	—
Paving	Paving	7/30/2025	8/27/2025	5.00	21.0	—
Architectural Coating	Architectural Coating	8/28/2025	9/25/2025	5.00	21.0	—

5.2. Off-Road Equipment

5.2.1. Unmitigated

Phase Name	Equipment Type	Fuel Type	Engine Tier	Number per Day	Hours Per Day	Horsepower	Load Factor
Site Preparation	Graders	Diesel	Average	1.00	8.00	148	0.41
Site Preparation	Rubber Tired Dozers	Diesel	Average	1.00	7.00	367	0.40
Site Preparation	Tractors/Loaders/Backhoes	Diesel	Average	1.00	8.00	84.0	0.37
Grading	Graders	Diesel	Average	1.00	8.00	148	0.41
Grading	Rubber Tired Dozers	Diesel	Average	1.00	8.00	367	0.40
Grading	Tractors/Loaders/Backhoes	Diesel	Average	2.00	7.00	84.0	0.37
Building Construction	Cranes	Diesel	Average	1.00	6.00	367	0.29

Building Construction	Forklifts	Diesel	Average	1.00	6.00	82.0	0.20
Building Construction	Generator Sets	Diesel	Average	1.00	8.00	14.0	0.74
Building Construction	Tractors/Loaders/Backhoes	Diesel	Average	1.00	6.00	84.0	0.37
Building Construction	Welders	Diesel	Average	3.00	8.00	46.0	0.45
Paving	Cement and Mortar Mixers	Diesel	Average	1.00	6.00	10.0	0.56
Paving	Pavers	Diesel	Average	1.00	6.00	81.0	0.42
Paving	Paving Equipment	Diesel	Average	1.00	8.00	89.0	0.36
Paving	Rollers	Diesel	Average	1.00	7.00	36.0	0.38
Paving	Tractors/Loaders/Backhoes	Diesel	Average	1.00	8.00	84.0	0.37
Architectural Coating	Air Compressors	Diesel	Average	1.00	6.00	37.0	0.48

5.3. Construction Vehicles

5.3.1. Unmitigated

Phase Name	Trip Type	One-Way Trips per Day	Miles per Trip	Vehicle Mix
Site Preparation	—	—	—	—
Site Preparation	Worker	7.50	18.5	LDA,LDT1,LDT2
Site Preparation	Vendor	6.00	10.2	HHDT,MHDT
Site Preparation	Hauling	0.00	20.0	HHDT
Site Preparation	Onsite truck	—	—	HHDT
Grading	—	—	—	—
Grading	Worker	10.0	18.5	LDA,LDT1,LDT2
Grading	Vendor	6.00	10.2	HHDT,MHDT
Grading	Hauling	0.00	20.0	HHDT
Grading	Onsite truck	—	—	HHDT

Building Construction	—	—	—	—
Building Construction	Worker	15.5	18.5	LDA,LDT1,LDT2
Building Construction	Vendor	6.00	10.2	HHDT,MHDT
Building Construction	Hauling	0.00	20.0	HHDT
Building Construction	Onsite truck	—	—	HHDT
Paving	—	—	—	—
Paving	Worker	12.5	18.5	LDA,LDT1,LDT2
Paving	Vendor	6.00	10.2	HHDT,MHDT
Paving	Hauling	0.00	20.0	HHDT
Paving	Onsite truck	—	—	HHDT
Architectural Coating	—	—	—	—
Architectural Coating	Worker	3.10	18.5	LDA,LDT1,LDT2
Architectural Coating	Vendor	—	10.2	HHDT,MHDT
Architectural Coating	Hauling	0.00	20.0	HHDT
Architectural Coating	Onsite truck	—	—	HHDT

5.4. Vehicles

5.4.1. Construction Vehicle Control Strategies

Control Strategies Applied	PM10 Reduction	PM2.5 Reduction
Water unpaved roads twice daily	55%	55%
Limit vehicle speeds on unpaved roads to 25 mph	44%	44%

5.5. Architectural Coatings

Phase Name	Residential Interior Area Coated (sq ft)	Residential Exterior Area Coated (sq ft)	Non-Residential Interior Area Coated (sq ft)	Non-Residential Exterior Area Coated (sq ft)	Parking Area Coated (sq ft)
Architectural Coating	0.00	0.00	55,350	18,450	—

5.6. Dust Mitigation

5.6.1. Construction Earthmoving Activities

Phase Name	Material Imported (cy)	Material Exported (cy)	Acres Graded (acres)	Material Demolished (sq. ft.)	Acres Paved (acres)
Site Preparation	—	—	0.00	0.00	—
Grading	—	—	9.00	0.00	—
Paving	0.00	0.00	0.00	0.00	1.00

5.6.2. Construction Earthmoving Control Strategies

Control Strategies Applied	Frequency (per day)	PM10 Reduction	PM2.5 Reduction
Water Exposed Area	3	74%	74%

5.7. Construction Paving

Land Use	Area Paved (acres)	% Asphalt
University/College (4yr)	1.00	100%

5.8. Construction Electricity Consumption and Emissions Factors

kWh per Year and Emission Factor (lb/MWh)

Year	kWh per Year	CO2	CH4	N2O
2024	0.00	457	0.03	< 0.005
2025	0.00	457	0.03	< 0.005

5.18. Vegetation

5.18.1. Land Use Change

5.18.1.1. Unmitigated

Vegetation Land Use Type	Vegetation Soil Type	Initial Acres	Final Acres

5.18.1. Biomass Cover Type

5.18.1.1. Unmitigated

Biomass Cover Type	Initial Acres	Final Acres

5.18.2. Sequestration

5.18.2.1. Unmitigated

Tree Type	Number	Electricity Saved (kWh/year)	Natural Gas Saved (btu/year)

6. Climate Risk Detailed Report

6.1. Climate Risk Summary

Cal-Adapt midcentury 2040–2059 average projections for four hazards are reported below for your project location. These are under Representation Concentration Pathway (RCP) 8.5 which assumes GHG emissions will continue to rise strongly through 2050 and then plateau around 2100.

Climate Hazard	Result for Project Location	Unit
Temperature and Extreme Heat	32.9	annual days of extreme heat
Extreme Precipitation	0.10	annual days with precipitation above 20 mm
Sea Level Rise	0.00	meters of inundation depth
Wildfire	0.00	annual hectares burned

Temperature and Extreme Heat data are for grid cell in which your project are located. The projection is based on the 98th historical percentile of daily maximum/minimum temperatures from observed historical data (32 climate model ensemble from Cal-Adapt, 2040–2059 average under RCP 8.5). Each grid cell is 6 kilometers (km) by 6 km, or 3.7 miles (mi) by 3.7 mi.
Extreme Precipitation data are for the grid cell in which your project are located. The threshold of 20 mm is equivalent to about ¾ an inch of rain, which would be light to moderate rainfall if received over a full day or heavy rain if received over a period of 2 to 4 hours. Each grid cell is 6 kilometers (km) by 6 km, or 3.7 miles (mi) by 3.7 mi.

Sea Level Rise data are for the grid cell in which your project are located. The projections are from Radke et al. (2017), as reported in Cal-Adapt (2040–2059 average under RCP 8.5), and consider different increments of sea level rise coupled with extreme storm events. Users may select from four model simulations to view the range in potential inundation depth for the grid cell. The four simulations make different assumptions about expected rainfall and temperature are: Warmer/drier (HadGEM2-ES), Cooler/wetter (CNRM-CM5), Average conditions (CanESM2), Range of different rainfall and temperature possibilities (MIROC5). Each grid cell is 50 meters (m) by 50 m, or about 164 feet (ft) by 164 ft.
Wildfire data are for the grid cell in which your project are located. The projections are from UC Davis, as reported in Cal-Adapt (2040–2059 average under RCP 8.5), and consider historical data of climate, vegetation, population density, and large (> 400 ha) fire history. Users may select from four model simulations to view the range in potential wildfire probabilities for the grid cell. The four simulations make different assumptions about expected rainfall and temperature are: Warmer/drier (HadGEM2-ES), Cooler/wetter (CNRM-CM5), Average conditions (CanESM2), Range of different rainfall and temperature possibilities (MIROC5). Each grid cell is 6 kilometers (km) by 6 km, or 3.7 miles (mi) by 3.7 mi.

6.2. Initial Climate Risk Scores

Climate Hazard	Exposure Score	Sensitivity Score	Adaptive Capacity Score	Vulnerability Score
Temperature and Extreme Heat	N/A	N/A	N/A	N/A
Extreme Precipitation	N/A	N/A	N/A	N/A
Sea Level Rise	N/A	N/A	N/A	N/A
Wildfire	N/A	N/A	N/A	N/A
Flooding	N/A	N/A	N/A	N/A
Drought	N/A	N/A	N/A	N/A
Snowpack Reduction	N/A	N/A	N/A	N/A
Air Quality Degradation	N/A	N/A	N/A	N/A

The sensitivity score reflects the extent to which a project would be adversely affected by exposure to a climate hazard. Exposure is rated on a scale of 1 to 5, with a score of 5 representing the greatest exposure.
The adaptive capacity of a project refers to its ability to manage and reduce vulnerabilities from projected climate hazards. Adaptive capacity is rated on a scale of 1 to 5, with a score of 5 representing the greatest ability to adapt.
The overall vulnerability scores are calculated based on the potential impacts and adaptive capacity assessments for each hazard. Scores do not include implementation of climate risk reduction measures.

6.3. Adjusted Climate Risk Scores

Climate Hazard	Exposure Score	Sensitivity Score	Adaptive Capacity Score	Vulnerability Score
Temperature and Extreme Heat	N/A	N/A	N/A	N/A
Extreme Precipitation	N/A	N/A	N/A	N/A
Sea Level Rise	N/A	N/A	N/A	N/A
Wildfire	N/A	N/A	N/A	N/A
Flooding	N/A	N/A	N/A	N/A

Drought	N/A	N/A	N/A	N/A
Snowpack Reduction	N/A	N/A	N/A	N/A
Air Quality Degradation	N/A	N/A	N/A	N/A

The sensitivity score reflects the extent to which a project would be adversely affected by exposure to a climate hazard. Exposure is rated on a scale of 1 to 5, with a score of 5 representing the greatest exposure.
The adaptive capacity of a project refers to its ability to manage and reduce vulnerabilities from projected climate hazards. Adaptive capacity is rated on a scale of 1 to 5, with a score of 5 representing the greatest ability to adapt.
The overall vulnerability scores are calculated based on the potential impacts and adaptive capacity assessments for each hazard. Scores include implementation of climate risk reduction measures.

6.4. Climate Risk Reduction Measures

7. Health and Equity Details

7.1. CalEnviroScreen 4.0 Scores

The maximum CalEnviroScreen score is 100. A high score (i.e., greater than 50) reflects a higher pollution burden compared to other census tracts in the state.

Indicator	Result for Project Census Tract
Exposure Indicators	—
AQ-Ozone	32.2
AQ-PM	34.7
AQ-DPM	10.2
Drinking Water	37.6
Lead Risk Housing	63.6
Pesticides	91.4
Toxic Releases	11.0
Traffic	5.41
Effect Indicators	—
CleanUp Sites	41.1
Groundwater	90.7
Haz Waste Facilities/Generators	27.1

Impaired Water Bodies	99.7
Solid Waste	95.3
Sensitive Population	—
Asthma	95.7
Cardio-vascular	79.7
Low Birth Weights	9.33
Socioeconomic Factor Indicators	—
Education	54.4
Housing	—
Linguistic	62.7
Poverty	71.1
Unemployment	97.1

7.2. Healthy Places Index Scores

The maximum Health Places Index score is 100. A high score (i.e., greater than 50) reflects healthier community conditions compared to other census tracts in the state.

Indicator	Result for Project Census Tract
Economic	—
Above Poverty	—
Employed	—
Median HI	—
Education	—
Bachelor's or higher	—
High school enrollment	—
Preschool enrollment	—
Transportation	—
Auto Access	—
Active commuting	—

Social	—
2-parent households	—
Voting	—
Neighborhood	—
Alcohol availability	—
Park access	—
Retail density	—
Supermarket access	—
Tree canopy	—
Housing	—
Homeownership	—
Housing habitability	—
Low-inc homeowner severe housing cost burden	—
Low-inc renter severe housing cost burden	—
Uncrowded housing	—
Health Outcomes	—
Insured adults	—
Arthritis	0.0
Asthma ER Admissions	2.9
High Blood Pressure	0.0
Cancer (excluding skin)	0.0
Asthma	0.0
Coronary Heart Disease	0.0
Chronic Obstructive Pulmonary Disease	0.0
Diagnosed Diabetes	0.0
Life Expectancy at Birth	0.0
Cognitively Disabled	19.2

Physically Disabled	42.3
Heart Attack ER Admissions	25.2
Mental Health Not Good	0.0
Chronic Kidney Disease	0.0
Obesity	0.0
Pedestrian Injuries	0.0
Physical Health Not Good	0.0
Stroke	0.0
Health Risk Behaviors	—
Binge Drinking	0.0
Current Smoker	0.0
No Leisure Time for Physical Activity	0.0
Climate Change Exposures	—
Wildfire Risk	0.0
SLR Inundation Area	0.0
Children	68.4
Elderly	33.9
English Speaking	0.0
Foreign-born	0.0
Outdoor Workers	1.2
Climate Change Adaptive Capacity	—
Impervious Surface Cover	97.8
Traffic Density	0.0
Traffic Access	23.0
Other Indices	—
Hardship	0.0
Other Decision Support	—

2016 Voting	0.0

7.3. Overall Health & Equity Scores

Metric	Result for Project Census Tract
CalEnviroScreen 4.0 Score for Project Location (a)	75.0
Healthy Places Index Score for Project Location (b)	—
Project Located in a Designated Disadvantaged Community (Senate Bill 535)	Yes
Project Located in a Low-Income Community (Assembly Bill 1550)	No
Project Located in a Community Air Protection Program Community (Assembly Bill 617)	No

a: The maximum CalEnviroScreen score is 100. A high score (i.e., greater than 50) reflects a higher pollution burden compared to other census tracts in the state.
b: The maximum Health Places Index score is 100. A high score (i.e., greater than 50) reflects healthier community conditions compared to other census tracts in the state.

7.4. Health & Equity Measures

No Health & Equity Measures selected.

7.5. Evaluation Scorecard

Health & Equity Evaluation Scorecard not completed.

7.6. Health & Equity Custom Measures

No Health & Equity Custom Measures created.

8. User Changes to Default Data

Screen	Justification
Land Use	Project dimensions provided by applicant. Consistent with August 2023 PD updates.
Construction: Construction Phases	Project-specific detail. CalEEMod construction phases scaled per total construction period provided by the applicant. Paving added consistent with August 2023 PD updates.
Construction: Dust From Material Movement	Per the project applicant, approximately 39,098 SF (0.895 acres) would require grading. Given that multiple passes are typically required, the CalEEMod default acreage was used for grading phase. No grading anticipated during the site preparation phase.
Construction: Trips and VMT	Vendor trips included.

Construction: On-Road Fugitive Dust	Assuming 95% of travel would be on paved roads.
Construction: Paving	41,297 SF (0.95 acres) of hardscape improvements. Assumed entirely asphalt pavement. Consistent with August 2023 PD updates.

SDSU Brawley Operations_August Updates Detailed Report

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1. Basic Project Information

1.1. Basic Project Information

Data Field	Value
Project Name	SDSU Brawley Operations_August Updates
Operational Year	2026
Lead Agency	—
Land Use Scale	Project/site
Analysis Level for Defaults	County
Windspeed (m/s)	3.40
Precipitation (days)	4.80
Location	San Diego State University, 560 CA-78, Brawley, CA 92227, USA
County	Imperial
City	Unincorporated
Air District	Imperial County APCD
Air Basin	Salton Sea
TAZ	5601
EDFZ	19
Electric Utility	Imperial Irrigation District
Gas Utility	Southern California Gas
App Version	2022.1.1.18

1.2. Land Use Types

Land Use Subtype	Size	Unit	Lot Acreage	Building Area (sq ft)	Landscape Area (sq ft)	Special Landscape Area (sq ft)	Population	Description
University/College (4yr)	850	Student	1.50	36,900	61,119	61,119	—	—

1.3. User-Selected Emission Reduction Measures by Emissions Sector

Sector	#	Measure Title
Energy	E-10-B	Establish Onsite Renewable Energy Systems: Solar Power

2. Emissions Summary

2.4. Operations Emissions Compared Against Thresholds

Criteria Pollutants (lb/day for daily, ton/yr for annual) and GHGs (lb/day for daily, MT/yr for annual)

Un/Mit.	TOG	ROG	NOx	CO	SO2	PM10E	PM10D	PM10T	PM2.5E	PM2.5D	PM2.5T	BCO2	NBCO2	CO2T	CH4	N2O	R	CO2e
Daily, Summer (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Unmit.	7.18	7.47	18.3	23.7	0.03	0.96	0.00	0.96	0.96	0.00	0.96	87.1	4,245	4,332	8.96	0.05	0.14	4,571
Mit.	7.18	7.47	18.3	23.7	0.03	0.96	0.00	0.96	0.96	0.00	0.96	87.1	4,153	4,240	8.95	0.05	0.14	4,478
% Reduced	—	—	—	—	—	—	—	—	—	—	—	—	2%	2%	< 0.5%	3%	—	2%
Daily, Winter (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Unmit.	7.18	7.47	18.3	23.7	0.03	0.96	0.00	0.96	0.96	0.00	0.96	87.1	4,245	4,332	8.96	0.05	0.14	4,571
Mit.	7.18	7.47	18.3	23.7	0.03	0.96	0.00	0.96	0.96	0.00	0.96	87.1	4,153	4,240	8.95	0.05	0.14	4,478
% Reduced	—	—	—	—	—	—	—	—	—	—	—	—	2%	2%	< 0.5%	3%	—	2%
Average Daily (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Unmit.	0.07	0.99	0.17	0.22	< 0.005	0.01	0.00	0.01	0.01	0.00	0.01	87.1	931	1,018	8.83	0.02	0.14	1,246
Mit.	0.07	0.99	0.17	0.22	< 0.005	0.01	0.00	0.01	0.01	0.00	0.01	87.1	839	926	8.82	0.02	0.14	1,153
% Reduced	—	—	—	—	—	—	—	—	—	—	—	—	10%	9%	< 0.5%	6%	—	7%

Annual (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Unmit.	0.01	0.18	0.03	0.04	< 0.005	< 0.005	0.00	< 0.005	< 0.005	0.00	< 0.005	14.4	154	169	1.46	< 0.005	0.02	206
Mit.	0.01	0.18	0.03	0.04	< 0.005	< 0.005	0.00	< 0.005	< 0.005	0.00	< 0.005	14.4	139	153	1.46	< 0.005	0.02	191
% Reduced	—	—	—	—	—	—	—	—	—	—	—	—	10%	9%	< 0.5%	6%	—	7%

2.5. Operations Emissions by Sector, Unmitigated

Criteria Pollutants (lb/day for daily, ton/yr for annual) and GHGs (lb/day for daily, MT/yr for annual)

Sector	TOG	ROG	NOx	CO	SO2	PM10E	PM10D	PM10T	PM2.5E	PM2.5D	PM2.5T	BCO2	NBCO2	CO2T	CH4	N2O	R	CO2e
Daily, Summer (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Mobile	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00	0.00
Area	—	0.93	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Energy	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	—	0.00	—	888	888	0.11	0.01	—	895
Water	—	—	—	—	—	—	—	—	—	—	—	3.49	12.6	16.1	0.36	0.01	—	27.7
Waste	—	—	—	—	—	—	—	—	—	—	—	83.6	0.00	83.6	8.36	0.00	—	292
Refrig.	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	0.14	0.14
Stationary	7.18	6.54	18.3	23.7	0.03	0.96	—	0.96	0.96	—	0.96	—	3,345	3,345	0.13	0.03	—	3,356
Total	7.18	7.47	18.3	23.7	0.03	0.96	0.00	0.96	0.96	0.00	0.96	87.1	4,245	4,332	8.96	0.05	0.14	4,571
Daily, Winter (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Mobile	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00	0.00
Area	—	0.93	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Energy	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	—	0.00	—	888	888	0.11	0.01	—	895
Water	—	—	—	—	—	—	—	—	—	—	—	3.49	12.6	16.1	0.36	0.01	—	27.7
Waste	—	—	—	—	—	—	—	—	—	—	—	83.6	0.00	83.6	8.36	0.00	—	292

Refrig.	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	0.14	0.14
Stationary	7.18	6.54	18.3	23.7	0.03	0.96	—	0.96	0.96	—	0.96	—	3,345	3,345	0.13	0.03	—	3,356
Total	7.18	7.47	18.3	23.7	0.03	0.96	0.00	0.96	0.96	0.00	0.96	87.1	4,245	4,332	8.96	0.05	0.14	4,571
Average Daily	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Mobile	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00	0.00
Area	—	0.93	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Energy	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	—	0.00	—	888	888	0.11	0.01	—	895
Water	—	—	—	—	—	—	—	—	—	—	—	3.49	12.6	16.1	0.36	0.01	—	27.7
Waste	—	—	—	—	—	—	—	—	—	—	—	83.6	0.00	83.6	8.36	0.00	—	292
Refrig.	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	0.14	0.14
Stationary	0.07	0.06	0.17	0.22	< 0.005	0.01	—	0.01	0.01	—	0.01	—	30.5	30.5	< 0.005	< 0.005	—	30.6
Total	0.07	0.99	0.17	0.22	< 0.005	0.01	0.00	0.01	0.01	0.00	0.01	87.1	931	1,018	8.83	0.02	0.14	1,246
Annual	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Mobile	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00	0.00
Area	—	0.17	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Energy	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	—	0.00	—	147	147	0.02	< 0.005	—	148
Water	—	—	—	—	—	—	—	—	—	—	—	0.58	2.09	2.67	0.06	< 0.005	—	4.58
Waste	—	—	—	—	—	—	—	—	—	—	—	13.8	0.00	13.8	1.38	0.00	—	48.4
Refrig.	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	0.02	0.02
Stationary	0.01	0.01	0.03	0.04	< 0.005	< 0.005	—	< 0.005	< 0.005	—	< 0.005	—	5.06	5.06	< 0.005	< 0.005	—	5.07
Total	0.01	0.18	0.03	0.04	< 0.005	< 0.005	0.00	< 0.005	< 0.005	0.00	< 0.005	14.4	154	169	1.46	< 0.005	0.02	206

2.6. Operations Emissions by Sector, Mitigated

Criteria Pollutants (lb/day for daily, ton/yr for annual) and GHGs (lb/day for daily, MT/yr for annual)

Sector	TOG	ROG	NOx	CO	SO2	PM10E	PM10D	PM10T	PM2.5E	PM2.5D	PM2.5T	BCO2	NBCO2	CO2T	CH4	N2O	R	CO2e

Daily, Summer (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Mobile	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00	0.00
Area	—	0.93	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Energy	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	—	0.00	—	795	795	0.10	0.01	—	802
Water	—	—	—	—	—	—	—	—	—	—	—	3.49	12.6	16.1	0.36	0.01	—	27.7
Waste	—	—	—	—	—	—	—	—	—	—	—	83.6	0.00	83.6	8.36	0.00	—	292
Refrig.	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	0.14	0.14
Stationary	7.18	6.54	18.3	23.7	0.03	0.96	—	0.96	0.96	—	0.96	—	3,345	3,345	0.13	0.03	—	3,356
Total	7.18	7.47	18.3	23.7	0.03	0.96	0.00	0.96	0.96	0.00	0.96	87.1	4,153	4,240	8.95	0.05	0.14	4,478
Daily, Winter (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Mobile	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00	0.00
Area	—	0.93	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Energy	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	—	0.00	—	795	795	0.10	0.01	—	802
Water	—	—	—	—	—	—	—	—	—	—	—	3.49	12.6	16.1	0.36	0.01	—	27.7
Waste	—	—	—	—	—	—	—	—	—	—	—	83.6	0.00	83.6	8.36	0.00	—	292
Refrig.	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	0.14	0.14
Stationary	7.18	6.54	18.3	23.7	0.03	0.96	—	0.96	0.96	—	0.96	—	3,345	3,345	0.13	0.03	—	3,356
Total	7.18	7.47	18.3	23.7	0.03	0.96	0.00	0.96	0.96	0.00	0.96	87.1	4,153	4,240	8.95	0.05	0.14	4,478
Average Daily	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Mobile	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00	0.00
Area	—	0.93	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Energy	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	—	0.00	—	795	795	0.10	0.01	—	802
Water	—	—	—	—	—	—	—	—	—	—	—	3.49	12.6	16.1	0.36	0.01	—	27.7

Waste	—	—	—	—	—	—	—	—	—	—	—	83.6	0.00	83.6	8.36	0.00	—	292
Refrig.	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	0.14	0.14
Stationary	0.07	0.06	0.17	0.22	< 0.005	0.01	—	0.01	0.01	—	0.01	—	30.5	30.5	< 0.005	< 0.005	—	30.6
Total	0.07	0.99	0.17	0.22	< 0.005	0.01	0.00	0.01	0.01	0.00	0.01	87.1	839	926	8.82	0.02	0.14	1,153
Annual	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Mobile	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00	0.00
Area	—	0.17	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Energy	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	—	0.00	—	132	132	0.02	< 0.005	—	133
Water	—	—	—	—	—	—	—	—	—	—	—	0.58	2.09	2.67	0.06	< 0.005	—	4.58
Waste	—	—	—	—	—	—	—	—	—	—	—	13.8	0.00	13.8	1.38	0.00	—	48.4
Refrig.	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	0.02	0.02
Stationary	0.01	0.01	0.03	0.04	< 0.005	< 0.005	—	< 0.005	< 0.005	—	< 0.005	—	5.06	5.06	< 0.005	< 0.005	—	5.07
Total	0.01	0.18	0.03	0.04	< 0.005	< 0.005	0.00	< 0.005	< 0.005	0.00	< 0.005	14.4	139	153	1.46	< 0.005	0.02	191

4. Operations Emissions Details

4.1. Mobile Emissions by Land Use

4.1.1. Unmitigated

Criteria Pollutants (lb/day for daily, ton/yr for annual) and GHGs (lb/day for daily, MT/yr for annual)

Land Use	TOG	ROG	NOx	CO	SO2	PM10E	PM10D	PM10T	PM2.5E	PM2.5D	PM2.5T	BCO2	NBCO2	CO2T	CH4	N2O	R	CO2e
Daily, Summer (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
University/College (4yr)	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00	0.00

Total	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00	0.00
Daily, Winter (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
University/College (4yr)	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00	0.00
Total	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00	0.00
Annual	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
University/College (4yr)	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00	0.00
Total	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00	0.00

4.1.2. Mitigated

Criteria Pollutants (lb/day for daily, ton/yr for annual) and GHGs (lb/day for daily, MT/yr for annual)

Land Use	TOG	ROG	NOx	CO	SO2	PM10E	PM10D	PM10T	PM2.5E	PM2.5D	PM2.5T	BCO2	NBCO2	CO2T	CH4	N2O	R	CO2e
Daily, Summer (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
University/College (4yr)	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00	0.00
Total	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00	0.00
Daily, Winter (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
University/College (4yr)	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00	0.00
Total	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00	0.00
Annual	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—

Universit (4yr)	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00	0.00
Total	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00	0.00

4.2. Energy

4.2.1. Electricity Emissions By Land Use - Unmitigated

Criteria Pollutants (lb/day for daily, ton/yr for annual) and GHGs (lb/day for daily, MT/yr for annual)

Land Use	TOG	ROG	NOx	CO	SO2	PM10E	PM10D	PM10T	PM2.5E	PM2.5D	PM2.5T	BCO2	NBCO2	CO2T	CH4	N2O	R	CO2e
Daily, Summer (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
University/College (4yr)	—	—	—	—	—	—	—	—	—	—	—	—	888	888	0.11	0.01	—	895
Total	—	—	—	—	—	—	—	—	—	—	—	—	888	888	0.11	0.01	—	895
Daily, Winter (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
University/College (4yr)	—	—	—	—	—	—	—	—	—	—	—	—	888	888	0.11	0.01	—	895
Total	—	—	—	—	—	—	—	—	—	—	—	—	888	888	0.11	0.01	—	895
Annual	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
University/College (4yr)	—	—	—	—	—	—	—	—	—	—	—	—	147	147	0.02	< 0.005	—	148
Total	—	—	—	—	—	—	—	—	—	—	—	—	147	147	0.02	< 0.005	—	148

4.2.2. Electricity Emissions By Land Use - Mitigated

Criteria Pollutants (lb/day for daily, ton/yr for annual) and GHGs (lb/day for daily, MT/yr for annual)

Land Use	TOG	ROG	NOx	CO	SO2	PM10E	PM10D	PM10T	PM2.5E	PM2.5D	PM2.5T	BCO2	NBCO2	CO2T	CH4	N2O	R	CO2e
Daily, Summer (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
University/College (4yr)	—	—	—	—	—	—	—	—	—	—	—	—	795	795	0.10	0.01	—	802
Total	—	—	—	—	—	—	—	—	—	—	—	—	795	795	0.10	0.01	—	802
Daily, Winter (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
University/College (4yr)	—	—	—	—	—	—	—	—	—	—	—	—	795	795	0.10	0.01	—	802
Total	—	—	—	—	—	—	—	—	—	—	—	—	795	795	0.10	0.01	—	802
Annual	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
University/College (4yr)	—	—	—	—	—	—	—	—	—	—	—	—	132	132	0.02	< 0.005	—	133
Total	—	—	—	—	—	—	—	—	—	—	—	—	132	132	0.02	< 0.005	—	133

4.2.3. Natural Gas Emissions By Land Use - Unmitigated

Criteria Pollutants (lb/day for daily, ton/yr for annual) and GHGs (lb/day for daily, MT/yr for annual)

Land Use	TOG	ROG	NOx	CO	SO2	PM10E	PM10D	PM10T	PM2.5E	PM2.5D	PM2.5T	BCO2	NBCO2	CO2T	CH4	N2O	R	CO2e
Daily, Summer (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
University/College (4yr)	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	—	0.00	—	0.00	0.00	0.00	0.00	—	0.00
Total	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	—	0.00	—	0.00	0.00	0.00	0.00	—	0.00

Daily, Winter (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
University/College (4yr)	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	—	0.00	—	0.00	0.00	0.00	0.00	—	0.00
Total	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	—	0.00	—	0.00	0.00	0.00	0.00	—	0.00
Annual	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
University/College (4yr)	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	—	0.00	—	0.00	0.00	0.00	0.00	—	0.00
Total	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	—	0.00	—	0.00	0.00	0.00	0.00	—	0.00

4.2.4. Natural Gas Emissions By Land Use - Mitigated

Criteria Pollutants (lb/day for daily, ton/yr for annual) and GHGs (lb/day for daily, MT/yr for annual)

Land Use	TOG	ROG	NOx	CO	SO2	PM10E	PM10D	PM10T	PM2.5E	PM2.5D	PM2.5T	BCO2	NBCO2	CO2T	CH4	N2O	R	CO2e
Daily, Summer (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
University/College (4yr)	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	—	0.00	—	0.00	0.00	0.00	0.00	—	0.00
Total	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	—	0.00	—	0.00	0.00	0.00	0.00	—	0.00
Daily, Winter (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
University/College (4yr)	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	—	0.00	—	0.00	0.00	0.00	0.00	—	0.00
Total	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	—	0.00	—	0.00	0.00	0.00	0.00	—	0.00
Annual	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—

University/College	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	—	0.00	—	0.00	0.00	0.00	0.00	—	0.00
Total	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	—	0.00	—	0.00	0.00	0.00	0.00	—	0.00

4.3. Area Emissions by Source

4.3.1. Unmitigated

Criteria Pollutants (lb/day for daily, ton/yr for annual) and GHGs (lb/day for daily, MT/yr for annual)

Source	TOG	ROG	NOx	CO	SO2	PM10E	PM10D	PM10T	PM2.5E	PM2.5D	PM2.5T	BCO2	NBCO2	CO2T	CH4	N2O	R	CO2e
Daily, Summer (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Consumer Products	—	0.79	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Architectural Coatings	—	0.14	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Total	—	0.93	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Daily, Winter (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Consumer Products	—	0.79	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Architectural Coatings	—	0.14	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Total	—	0.93	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Annual	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Consumer Products	—	0.14	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—

Architect Coatings	—	0.03	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Total	—	0.17	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—

4.3.2. Mitigated

Criteria Pollutants (lb/day for daily, ton/yr for annual) and GHGs (lb/day for daily, MT/yr for annual)

Source	TOG	ROG	NOx	CO	SO2	PM10E	PM10D	PM10T	PM2.5E	PM2.5D	PM2.5T	BCO2	NBCO2	CO2T	CH4	N2O	R	CO2e
Daily, Summer (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Consumer Products	—	0.79	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Architectural Coatings	—	0.14	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Total	—	0.93	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Daily, Winter (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Consumer Products	—	0.79	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Architectural Coatings	—	0.14	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Total	—	0.93	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Annual	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Consumer Products	—	0.14	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Architectural Coatings	—	0.03	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—

Total	—	0.17	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—

4.4. Water Emissions by Land Use

4.4.1. Unmitigated

Criteria Pollutants (lb/day for daily, ton/yr for annual) and GHGs (lb/day for daily, MT/yr for annual)

Land Use	TOG	ROG	NOx	CO	SO2	PM10E	PM10D	PM10T	PM2.5E	PM2.5D	PM2.5T	BCO2	NBCO2	CO2T	CH4	N2O	R	CO2e
Daily, Summer (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
University/College (4yr)	—	—	—	—	—	—	—	—	—	—	—	3.49	12.6	16.1	0.36	0.01	—	27.7
Total	—	—	—	—	—	—	—	—	—	—	—	3.49	12.6	16.1	0.36	0.01	—	27.7
Daily, Winter (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
University/College (4yr)	—	—	—	—	—	—	—	—	—	—	—	3.49	12.6	16.1	0.36	0.01	—	27.7
Total	—	—	—	—	—	—	—	—	—	—	—	3.49	12.6	16.1	0.36	0.01	—	27.7
Annual	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
University/College (4yr)	—	—	—	—	—	—	—	—	—	—	—	0.58	2.09	2.67	0.06	< 0.005	—	4.58
Total	—	—	—	—	—	—	—	—	—	—	—	0.58	2.09	2.67	0.06	< 0.005	—	4.58

4.4.2. Mitigated

Criteria Pollutants (lb/day for daily, ton/yr for annual) and GHGs (lb/day for daily, MT/yr for annual)

Land Use	TOG	ROG	NOx	CO	SO2	PM10E	PM10D	PM10T	PM2.5E	PM2.5D	PM2.5T	BCO2	NBCO2	CO2T	CH4	N2O	R	CO2e

Daily, Summer (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
University/College (4yr)	—	—	—	—	—	—	—	—	—	—	—	3.49	12.6	16.1	0.36	0.01	—	27.7
Total	—	—	—	—	—	—	—	—	—	—	—	3.49	12.6	16.1	0.36	0.01	—	27.7
Daily, Winter (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
University/College (4yr)	—	—	—	—	—	—	—	—	—	—	—	3.49	12.6	16.1	0.36	0.01	—	27.7
Total	—	—	—	—	—	—	—	—	—	—	—	3.49	12.6	16.1	0.36	0.01	—	27.7
Annual	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
University/College (4yr)	—	—	—	—	—	—	—	—	—	—	—	0.58	2.09	2.67	0.06	< 0.005	—	4.58
Total	—	—	—	—	—	—	—	—	—	—	—	0.58	2.09	2.67	0.06	< 0.005	—	4.58

4.5. Waste Emissions by Land Use

4.5.1. Unmitigated

Criteria Pollutants (lb/day for daily, ton/yr for annual) and GHGs (lb/day for daily, MT/yr for annual)

Land Use	TOG	ROG	NOx	CO	SO2	PM10E	PM10D	PM10T	PM2.5E	PM2.5D	PM2.5T	BCO2	NBCO2	CO2T	CH4	N2O	R	CO2e
Daily, Summer (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
University/College (4yr)	—	—	—	—	—	—	—	—	—	—	—	83.6	0.00	83.6	8.36	0.00	—	292
Total	—	—	—	—	—	—	—	—	—	—	—	83.6	0.00	83.6	8.36	0.00	—	292

Daily, Winter (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
University/College (4yr)	—	—	—	—	—	—	—	—	—	—	—	83.6	0.00	83.6	8.36	0.00	—	292
Total	—	—	—	—	—	—	—	—	—	—	—	83.6	0.00	83.6	8.36	0.00	—	292
Annual	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
University/College (4yr)	—	—	—	—	—	—	—	—	—	—	—	13.8	0.00	13.8	1.38	0.00	—	48.4
Total	—	—	—	—	—	—	—	—	—	—	—	13.8	0.00	13.8	1.38	0.00	—	48.4

4.5.2. Mitigated

Criteria Pollutants (lb/day for daily, ton/yr for annual) and GHGs (lb/day for daily, MT/yr for annual)

Land Use	TOG	ROG	NOx	CO	SO2	PM10E	PM10D	PM10T	PM2.5E	PM2.5D	PM2.5T	BCO2	NBCO2	CO2T	CH4	N2O	R	CO2e
Daily, Summer (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
University/College (4yr)	—	—	—	—	—	—	—	—	—	—	—	83.6	0.00	83.6	8.36	0.00	—	292
Total	—	—	—	—	—	—	—	—	—	—	—	83.6	0.00	83.6	8.36	0.00	—	292
Daily, Winter (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
University/College (4yr)	—	—	—	—	—	—	—	—	—	—	—	83.6	0.00	83.6	8.36	0.00	—	292
Total	—	—	—	—	—	—	—	—	—	—	—	83.6	0.00	83.6	8.36	0.00	—	292
Annual	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—

University/College	—	—	—	—	—	—	—	—	—	—	—	13.8	0.00	13.8	1.38	0.00	—	48.4
Total	—	—	—	—	—	—	—	—	—	—	—	13.8	0.00	13.8	1.38	0.00	—	48.4

4.6. Refrigerant Emissions by Land Use

4.6.1. Unmitigated

Criteria Pollutants (lb/day for daily, ton/yr for annual) and GHGs (lb/day for daily, MT/yr for annual)

Land Use	TOG	ROG	NOx	CO	SO2	PM10E	PM10D	PM10T	PM2.5E	PM2.5D	PM2.5T	BCO2	NBCO2	CO2T	CH4	N2O	R	CO2e
Daily, Summer (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
University/College (4yr)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	0.14	0.14
Total	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	0.14	0.14
Daily, Winter (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
University/College (4yr)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	0.14	0.14
Total	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	0.14	0.14
Annual	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
University/College (4yr)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	0.02	0.02
Total	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	0.02	0.02

4.6.2. Mitigated

Criteria Pollutants (lb/day for daily, ton/yr for annual) and GHGs (lb/day for daily, MT/yr for annual)

Land Use	TOG	ROG	NOx	CO	SO2	PM10E	PM10D	PM10T	PM2.5E	PM2.5D	PM2.5T	BCO2	NBCO2	CO2T	CH4	N2O	R	CO2e
Daily, Summer (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
University/College (4yr)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	0.14	0.14
Total	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	0.14	0.14
Daily, Winter (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
University/College (4yr)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	0.14	0.14
Total	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	0.14	0.14
Annual	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
University/College (4yr)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	0.02	0.02
Total	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	0.02	0.02

4.7. Offroad Emissions By Equipment Type

4.7.1. Unmitigated

Criteria Pollutants (lb/day for daily, ton/yr for annual) and GHGs (lb/day for daily, MT/yr for annual)

Equipment Type	TOG	ROG	NOx	CO	SO2	PM10E	PM10D	PM10T	PM2.5E	PM2.5D	PM2.5T	BCO2	NBCO2	CO2T	CH4	N2O	R	CO2e
Daily, Summer (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Total	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—

Daily, Winter (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Total	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Annual	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Total	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—

4.7.2. Mitigated

Criteria Pollutants (lb/day for daily, ton/yr for annual) and GHGs (lb/day for daily, MT/yr for annual)

Equipment Type	TOG	ROG	NOx	CO	SO2	PM10E	PM10D	PM10T	PM2.5E	PM2.5D	PM2.5T	BCO2	NBCO2	CO2T	CH4	N2O	R	CO2e
Daily, Summer (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Total	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Daily, Winter (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Total	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Annual	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Total	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—

4.8. Stationary Emissions By Equipment Type

4.8.1. Unmitigated

Criteria Pollutants (lb/day for daily, ton/yr for annual) and GHGs (lb/day for daily, MT/yr for annual)

Equipment Type	TOG	ROG	NOx	CO	SO2	PM10E	PM10D	PM10T	PM2.5E	PM2.5D	PM2.5T	BCO2	NBCO2	CO2T	CH4	N2O	R	CO2e

Daily, Summer (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Emergency Generator	7.18	6.54	18.3	23.7	0.03	0.96	—	0.96	0.96	—	0.96	—	3,345	3,345	0.13	0.03	—	—
undefined	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	3,356
Total	7.18	6.54	18.3	23.7	0.03	0.96	—	0.96	0.96	—	0.96	—	3,345	3,345	0.13	0.03	—	3,356
Daily, Winter (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Emergency Generator	7.18	6.54	18.3	23.7	0.03	0.96	—	0.96	0.96	—	0.96	—	3,345	3,345	0.13	0.03	—	—
undefined	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	3,356
Total	7.18	6.54	18.3	23.7	0.03	0.96	—	0.96	0.96	—	0.96	—	3,345	3,345	0.13	0.03	—	3,356
Annual	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Emergency Generator	0.01	0.01	0.03	0.04	< 0.005	< 0.005	—	< 0.005	< 0.005	—	< 0.005	—	5.06	5.06	< 0.005	< 0.005	—	—
undefined	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	5.07
Total	0.01	0.01	0.03	0.04	< 0.005	< 0.005	—	< 0.005	< 0.005	—	< 0.005	—	5.06	5.06	< 0.005	< 0.005	—	5.07

4.8.2. Mitigated

Criteria Pollutants (lb/day for daily, ton/yr for annual) and GHGs (lb/day for daily, MT/yr for annual)

Equipment Type	TOG	ROG	NOx	CO	SO2	PM10E	PM10D	PM10T	PM2.5E	PM2.5D	PM2.5T	BCO2	NBCO2	CO2T	CH4	N2O	R	CO2e

Daily, Summer (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Emergency Generator	7.18	6.54	18.3	23.7	0.03	0.96	—	0.96	0.96	—	0.96	—	3,345	3,345	0.13	0.03	—	—
undefined	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	3,356
Total	7.18	6.54	18.3	23.7	0.03	0.96	—	0.96	0.96	—	0.96	—	3,345	3,345	0.13	0.03	—	3,356
Daily, Winter (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Emergency Generator	7.18	6.54	18.3	23.7	0.03	0.96	—	0.96	0.96	—	0.96	—	3,345	3,345	0.13	0.03	—	—
undefined	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	3,356
Total	7.18	6.54	18.3	23.7	0.03	0.96	—	0.96	0.96	—	0.96	—	3,345	3,345	0.13	0.03	—	3,356
Annual	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Emergency Generator	0.01	0.01	0.03	0.04	< 0.005	< 0.005	—	< 0.005	< 0.005	—	< 0.005	—	5.06	5.06	< 0.005	< 0.005	—	—
undefined	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	5.07
Total	0.01	0.01	0.03	0.04	< 0.005	< 0.005	—	< 0.005	< 0.005	—	< 0.005	—	5.06	5.06	< 0.005	< 0.005	—	5.07

4.9. User Defined Emissions By Equipment Type

4.9.1. Unmitigated

Criteria Pollutants (lb/day for daily, ton/yr for annual) and GHGs (lb/day for daily, MT/yr for annual)

Equipme Type	TOG	ROG	NOx	CO	SO2	PM10E	PM10D	PM10T	PM2.5E	PM2.5D	PM2.5T	BCO2	NBCO2	CO2T	CH4	N2O	R	CO2e
Daily, Summer (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Total	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Daily, Winter (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Total	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Annual	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Total	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—

4.9.2. Mitigated

Criteria Pollutants (lb/day for daily, ton/yr for annual) and GHGs (lb/day for daily, MT/yr for annual)

Equipment Type	TOG	ROG	NOx	CO	SO2	PM10E	PM10D	PM10T	PM2.5E	PM2.5D	PM2.5T	BCO2	NBCO2	CO2T	CH4	N2O	R	CO2e
Daily, Summer (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Total	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Daily, Winter (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Total	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Annual	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Total	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—

4.10. Soil Carbon Accumulation By Vegetation Type

4.10.1. Soil Carbon Accumulation By Vegetation Type - Unmitigated

Criteria Pollutants (lb/day for daily, ton/yr for annual) and GHGs (lb/day for daily, MT/yr for annual)

Vegetation	TOG	ROG	NOx	CO	SO2	PM10E	PM10D	PM10T	PM2.5E	PM2.5D	PM2.5T	BCO2	NBCO2	CO2T	CH4	N2O	R	CO2e
Daily, Summer (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Total	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Daily, Winter (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Total	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Annual	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Total	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—

4.10.2. Above and Belowground Carbon Accumulation by Land Use Type - Unmitigated

Criteria Pollutants (lb/day for daily, ton/yr for annual) and GHGs (lb/day for daily, MT/yr for annual)

Land Use	TOG	ROG	NOx	CO	SO2	PM10E	PM10D	PM10T	PM2.5E	PM2.5D	PM2.5T	BCO2	NBCO2	CO2T	CH4	N2O	R	CO2e
Daily, Summer (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Total	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Daily, Winter (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Total	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Annual	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Total	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—

4.10.3. Avoided and Sequestered Emissions by Species - Unmitigated

Criteria Pollutants (lb/day for daily, ton/yr for annual) and GHGs (lb/day for daily, MT/yr for annual)

Species	TOG	ROG	NOx	CO	SO2	PM10E	PM10D	PM10T	PM2.5E	PM2.5D	PM2.5T	BCO2	NBCO2	CO2T	CH4	N2O	R	CO2e
Daily, Summer (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Avoided	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Subtotal	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Sequestered	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Subtotal	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Removed	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Subtotal	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Daily, Winter (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Avoided	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Subtotal	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Sequestered	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Subtotal	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Removed	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Subtotal	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Annual	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Avoided	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Subtotal	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—

Sequest	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Subtotal	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Removed	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Subtotal	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—

4.10.4. Soil Carbon Accumulation By Vegetation Type - Mitigated

Criteria Pollutants (lb/day for daily, ton/yr for annual) and GHGs (lb/day for daily, MT/yr for annual)

Vegetation	TOG	ROG	NOx	CO	SO2	PM10E	PM10D	PM10T	PM2.5E	PM2.5D	PM2.5T	BCO2	NBCO2	CO2T	CH4	N2O	R	CO2e
Daily, Summer (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Total	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Daily, Winter (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Total	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Annual	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Total	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—

4.10.5. Above and Belowground Carbon Accumulation by Land Use Type - Mitigated

Criteria Pollutants (lb/day for daily, ton/yr for annual) and GHGs (lb/day for daily, MT/yr for annual)

Land Use	TOG	ROG	NOx	CO	SO2	PM10E	PM10D	PM10T	PM2.5E	PM2.5D	PM2.5T	BCO2	NBCO2	CO2T	CH4	N2O	R	CO2e
Daily, Summer (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Total	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—

Daily, Winter (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Total	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Annual	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Total	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—

4.10.6. Avoided and Sequestered Emissions by Species - Mitigated

Criteria Pollutants (lb/day for daily, ton/yr for annual) and GHGs (lb/day for daily, MT/yr for annual)

Species	TOG	ROG	NOx	CO	SO2	PM10E	PM10D	PM10T	PM2.5E	PM2.5D	PM2.5T	BCO2	NBCO2	CO2T	CH4	N2O	R	CO2e
Daily, Summer (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Avoided	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Subtotal	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Sequestered	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Subtotal	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Removed	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Subtotal	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Daily, Winter (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Avoided	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Subtotal	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Sequestered	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Subtotal	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—

Removed	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Subtotal	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Annual	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Avoided	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Subtotal	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Sequestered	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Subtotal	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Removed	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Subtotal	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—

5. Activity Data

5.9. Operational Mobile Sources

5.9.1. Unmitigated

Land Use Type	Trips/Weekday	Trips/Saturday	Trips/Sunday	Trips/Year	VMT/Weekday	VMT/Saturday	VMT/Sunday	VMT/Year
University/College (4yr)	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00

5.9.2. Mitigated

Land Use Type	Trips/Weekday	Trips/Saturday	Trips/Sunday	Trips/Year	VMT/Weekday	VMT/Saturday	VMT/Sunday	VMT/Year
University/College (4yr)	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00

5.10. Operational Area Sources

5.10.1. Hearths

5.10.1.1. Unmitigated

5.10.1.2. Mitigated

5.10.2. Architectural Coatings

Residential Interior Area Coated (sq ft)	Residential Exterior Area Coated (sq ft)	Non-Residential Interior Area Coated (sq ft)	Non-Residential Exterior Area Coated (sq ft)	Parking Area Coated (sq ft)
0	0.00	55,350	18,450	—

5.10.3. Landscape Equipment

Season	Unit	Value
Snow Days	day/yr	0.00
Summer Days	day/yr	180

5.10.4. Landscape Equipment - Mitigated

Season	Unit	Value
Snow Days	day/yr	0.00
Summer Days	day/yr	180

5.11. Operational Energy Consumption

5.11.1. Unmitigated

Electricity (kWh/yr) and CO2 and CH4 and N2O and Natural Gas (kBTU/yr)

Land Use	Electricity (kWh/yr)	CO2	CH4	N2O	Natural Gas (kBTU/yr)

University/College (4yr)	1,235,233	262	0.0330	0.0040	0.00

5.11.2. Mitigated

Electricity (kWh/yr) and CO2 and CH4 and N2O and Natural Gas (kBTU/yr)

Land Use	Electricity (kWh/yr)	CO2	CH4	N2O	Natural Gas (kBTU/yr)
University/College (4yr)	1,106,361	262	0.0330	0.0040	0.00

5.12. Operational Water and Wastewater Consumption

5.12.1. Unmitigated

Land Use	Indoor Water (gal/year)	Outdoor Water (gal/year)
University/College (4yr)	1,819,935	2,780,220

5.12.2. Mitigated

Land Use	Indoor Water (gal/year)	Outdoor Water (gal/year)
University/College (4yr)	1,819,935	2,780,220

5.13. Operational Waste Generation

5.13.1. Unmitigated

Land Use	Waste (ton/year)	Cogeneration (kWh/year)
University/College (4yr)	155	—

5.13.2. Mitigated

Land Use	Waste (ton/year)	Cogeneration (kWh/year)
University/College (4yr)	155	—

5.14. Operational Refrigeration and Air Conditioning Equipment

5.14.1. Unmitigated

Land Use Type	Equipment Type	Refrigerant	GWP	Quantity (kg)	Operations Leak Rate	Service Leak Rate	Times Serviced
University/College (4yr)	Household refrigerators and/or freezers	R-134a	1,430	0.02	0.60	0.00	1.00
University/College (4yr)	Other commercial A/C and heat pumps	R-410A	2,088	< 0.005	4.00	4.00	18.0
University/College (4yr)	Stand-alone retail refrigerators and freezers	R-134a	1,430	< 0.005	1.00	0.00	1.00
University/College (4yr)	Walk-in refrigerators and freezers	R-404A	3,922	< 0.005	7.50	7.50	20.0

5.14.2. Mitigated

Land Use Type	Equipment Type	Refrigerant	GWP	Quantity (kg)	Operations Leak Rate	Service Leak Rate	Times Serviced
University/College (4yr)	Household refrigerators and/or freezers	R-134a	1,430	0.02	0.60	0.00	1.00
University/College (4yr)	Other commercial A/C and heat pumps	R-410A	2,088	< 0.005	4.00	4.00	18.0
University/College (4yr)	Stand-alone retail refrigerators and freezers	R-134a	1,430	< 0.005	1.00	0.00	1.00
University/College (4yr)	Walk-in refrigerators and freezers	R-404A	3,922	< 0.005	7.50	7.50	20.0

5.15. Operational Off-Road Equipment

5.15.1. Unmitigated

Equipment Type	Fuel Type	Engine Tier	Number per Day	Hours Per Day	Horsepower	Load Factor

5.15.2. Mitigated

Equipment Type	Fuel Type	Engine Tier	Number per Day	Hours Per Day	Horsepower	Load Factor

5.16. Stationary Sources

5.16.1. Emergency Generators and Fire Pumps

Equipment Type	Fuel Type	Number per Day	Hours per Day	Hours per Year	Horsepower	Load Factor
Emergency Generator	Diesel	1.00	24.0	80.0	166	0.73

5.16.2. Process Boilers

Equipment Type	Fuel Type	Number	Boiler Rating (MMBtu/hr)	Daily Heat Input (MMBtu/day)	Annual Heat Input (MMBtu/yr)

5.17. User Defined

Equipment Type	Fuel Type
—	—

5.18. Vegetation

5.18.1. Land Use Change

5.18.1.1. Unmitigated

Vegetation Land Use Type	Vegetation Soil Type	Initial Acres	Final Acres

5.18.1.2. Mitigated

Vegetation Land Use Type	Vegetation Soil Type	Initial Acres	Final Acres

5.18.1. Biomass Cover Type

5.18.1.1. Unmitigated

Biomass Cover Type	Initial Acres	Final Acres

5.18.1.2. Mitigated

Biomass Cover Type	Initial Acres	Final Acres

5.18.2. Sequestration

5.18.2.1. Unmitigated

Tree Type	Number	Electricity Saved (kWh/year)	Natural Gas Saved (btu/year)

5.18.2.2. Mitigated

Tree Type	Number	Electricity Saved (kWh/year)	Natural Gas Saved (btu/year)

6. Climate Risk Detailed Report

6.1. Climate Risk Summary

Cal-Adapt midcentury 2040–2059 average projections for four hazards are reported below for your project location. These are under Representation Concentration Pathway (RCP) 8.5 which assumes GHG emissions will continue to rise strongly through 2050 and then plateau around 2100.

Climate Hazard	Result for Project Location	Unit
Temperature and Extreme Heat	32.9	annual days of extreme heat
Extreme Precipitation	0.10	annual days with precipitation above 20 mm
Sea Level Rise	0.00	meters of inundation depth
Wildfire	0.00	annual hectares burned

Temperature and Extreme Heat data are for grid cell in which your project are located. The projection is based on the 98th historical percentile of daily maximum/minimum temperatures from observed historical data (32 climate model ensemble from Cal-Adapt, 2040–2059 average under RCP 8.5). Each grid cell is 6 kilometers (km) by 6 km, or 3.7 miles (mi) by 3.7 mi.
Extreme Precipitation data are for the grid cell in which your project are located. The threshold of 20 mm is equivalent to about ¾ an inch of rain, which would be light to moderate rainfall if received over a full day or heavy rain if received over a period of 2 to 4 hours. Each grid cell is 6 kilometers (km) by 6 km, or 3.7 miles (mi) by 3.7 mi.
Sea Level Rise data are for the grid cell in which your project are located. The projections are from Radke et al. (2017), as reported in Cal-Adapt (2040–2059 average under RCP 8.5), and consider different increments of sea level rise coupled with extreme storm events. Users may select from four model simulations to view the range in potential inundation depth for the grid cell. The four simulations make different assumptions about expected rainfall and temperature are: Warmer/drier (HadGEM2-ES), Cooler/wetter (CNRM-CM5), Average conditions (CanESM2), Range of different rainfall and temperature possibilities (MIROC5). Each grid cell is 50 meters (m) by 50 m, or about 164 feet (ft) by 164 ft.
Wildfire data are for the grid cell in which your project are located. The projections are from UC Davis, as reported in Cal-Adapt (2040–2059 average under RCP 8.5), and consider historical data of climate, vegetation, population density, and large (> 400 ha) fire history. Users may select from four model simulations to view the range in potential wildfire probabilities for the grid cell. The four simulations make different assumptions about expected rainfall and temperature are: Warmer/drier (HadGEM2-ES), Cooler/wetter (CNRM-CM5), Average conditions (CanESM2), Range of different rainfall and temperature possibilities (MIROC5). Each grid cell is 6 kilometers (km) by 6 km, or 3.7 miles (mi) by 3.7 mi.

6.2. Initial Climate Risk Scores

Climate Hazard	Exposure Score	Sensitivity Score	Adaptive Capacity Score	Vulnerability Score
Temperature and Extreme Heat	N/A	N/A	N/A	N/A
Extreme Precipitation	N/A	N/A	N/A	N/A
Sea Level Rise	N/A	N/A	N/A	N/A
Wildfire	N/A	N/A	N/A	N/A
Flooding	N/A	N/A	N/A	N/A
Drought	N/A	N/A	N/A	N/A
Snowpack Reduction	N/A	N/A	N/A	N/A
Air Quality Degradation	N/A	N/A	N/A	N/A

The sensitivity score reflects the extent to which a project would be adversely affected by exposure to a climate hazard. Exposure is rated on a scale of 1 to 5, with a score of 5 representing the greatest exposure.
The adaptive capacity of a project refers to its ability to manage and reduce vulnerabilities from projected climate hazards. Adaptive capacity is rated on a scale of 1 to 5, with a score of 5 representing the greatest ability to adapt.
The overall vulnerability scores are calculated based on the potential impacts and adaptive capacity assessments for each hazard. Scores do not include implementation of climate risk reduction measures.

6.3. Adjusted Climate Risk Scores

Climate Hazard	Exposure Score	Sensitivity Score	Adaptive Capacity Score	Vulnerability Score
Temperature and Extreme Heat	N/A	N/A	N/A	N/A
Extreme Precipitation	N/A	N/A	N/A	N/A

Sea Level Rise	N/A	N/A	N/A	N/A
Wildfire	N/A	N/A	N/A	N/A
Flooding	N/A	N/A	N/A	N/A
Drought	N/A	N/A	N/A	N/A
Snowpack Reduction	N/A	N/A	N/A	N/A
Air Quality Degradation	N/A	N/A	N/A	N/A

The sensitivity score reflects the extent to which a project would be adversely affected by exposure to a climate hazard. Exposure is rated on a scale of 1 to 5, with a score of 5 representing the greatest exposure.
The adaptive capacity of a project refers to its ability to manage and reduce vulnerabilities from projected climate hazards. Adaptive capacity is rated on a scale of 1 to 5, with a score of 5 representing the greatest ability to adapt.
The overall vulnerability scores are calculated based on the potential impacts and adaptive capacity assessments for each hazard. Scores include implementation of climate risk reduction measures.

6.4. Climate Risk Reduction Measures

7. Health and Equity Details

7.1. CalEnviroScreen 4.0 Scores

The maximum CalEnviroScreen score is 100. A high score (i.e., greater than 50) reflects a higher pollution burden compared to other census tracts in the state.

Indicator	Result for Project Census Tract
Exposure Indicators	—
AQ-Ozone	32.2
AQ-PM	34.7
AQ-DPM	10.2
Drinking Water	37.6
Lead Risk Housing	63.6
Pesticides	91.4
Toxic Releases	11.0
Traffic	5.41
Effect Indicators	—

CleanUp Sites	41.1
Groundwater	90.7
Haz Waste Facilities/Generators	27.1
Impaired Water Bodies	99.7
Solid Waste	95.3
Sensitive Population	—
Asthma	95.7
Cardio-vascular	79.7
Low Birth Weights	9.33
Socioeconomic Factor Indicators	—
Education	54.4
Housing	—
Linguistic	62.7
Poverty	71.1
Unemployment	97.1

7.2. Healthy Places Index Scores

The maximum Health Places Index score is 100. A high score (i.e., greater than 50) reflects healthier community conditions compared to other census tracts in the state.

Indicator	Result for Project Census Tract
Economic	—
Above Poverty	—
Employed	—
Median HI	—
Education	—
Bachelor's or higher	—
High school enrollment	—
Preschool enrollment	—

Transportation	—
Auto Access	—
Active commuting	—
Social	—
2-parent households	—
Voting	—
Neighborhood	—
Alcohol availability	—
Park access	—
Retail density	—
Supermarket access	—
Tree canopy	—
Housing	—
Homeownership	—
Housing habitability	—
Low-inc homeowner severe housing cost burden	—
Low-inc renter severe housing cost burden	—
Uncrowded housing	—
Health Outcomes	—
Insured adults	—
Arthritis	0.0
Asthma ER Admissions	2.9
High Blood Pressure	0.0
Cancer (excluding skin)	0.0
Asthma	0.0
Coronary Heart Disease	0.0
Chronic Obstructive Pulmonary Disease	0.0

Diagnosed Diabetes	0.0
Life Expectancy at Birth	0.0
Cognitively Disabled	19.2
Physically Disabled	42.3
Heart Attack ER Admissions	25.2
Mental Health Not Good	0.0
Chronic Kidney Disease	0.0
Obesity	0.0
Pedestrian Injuries	0.0
Physical Health Not Good	0.0
Stroke	0.0
Health Risk Behaviors	—
Binge Drinking	0.0
Current Smoker	0.0
No Leisure Time for Physical Activity	0.0
Climate Change Exposures	—
Wildfire Risk	0.0
SLR Inundation Area	0.0
Children	68.4
Elderly	33.9
English Speaking	0.0
Foreign-born	0.0
Outdoor Workers	1.2
Climate Change Adaptive Capacity	—
Impervious Surface Cover	97.8
Traffic Density	0.0
Traffic Access	23.0

Other Indices	—
Hardship	0.0
Other Decision Support	—
2016 Voting	0.0

7.3. Overall Health & Equity Scores

Metric	Result for Project Census Tract
CalEnviroScreen 4.0 Score for Project Location (a)	75.0
Healthy Places Index Score for Project Location (b)	—
Project Located in a Designated Disadvantaged Community (Senate Bill 535)	Yes
Project Located in a Low-Income Community (Assembly Bill 1550)	No
Project Located in a Community Air Protection Program Community (Assembly Bill 617)	No

a: The maximum CalEnviroScreen score is 100. A high score (i.e., greater than 50) reflects a higher pollution burden compared to other census tracts in the state.
b: The maximum Health Places Index score is 100. A high score (i.e., greater than 50) reflects healthier community conditions compared to other census tracts in the state.

7.4. Health & Equity Measures

No Health & Equity Measures selected.

7.5. Evaluation Scorecard

Health & Equity Evaluation Scorecard not completed.

7.6. Health & Equity Custom Measures

No Health & Equity Custom Measures created.

8. User Changes to Default Data

Screen	Justification
Land Use	Project-specific dimensions provided by applicant. Consistent with August 2023 PD updates.
Operations: Road Dust	—

Operations: Vehicle Data	Mobile trips associated with the proposed 850 FTE students previously analyzed and approved with the 2003 PEIR for the Campus Master Plan. Operational emissions for the proposed project are only related to the proposed building envelope/site footprint.
Operations: Energy Use	Per project applicant, no natural gas proposed for the project.

Appendix C

Biological Resources Technical Memorandum

MEMORANDUM

To:	Michael Haberkorn, Gatzke Dillon & Ballance
From:	Callie Amoaku, Zarina Pringle, Dudek
Subject:	SDSU Brawley Sciences Building – Biological Resources Technical Memo
Date:	August 22, 2023
cc:	Sarah Lozano, Alexandra Martini, Dudek
Attachment(s):	A – Figures 1–4 B – Site Photographs C – Vascular Plant Species Compendium D – Wildlife Species Compendium E – Special-Status Plant Species Potential to Occur F – Special-Status Wildlife Species Potential to Occur

Dudek has conducted an evaluation pursuant to the requirements of the California Environmental Quality Act (CEQA), California Public Resources Code 21000, et seq., to determine the presence and potential impacts related to biological resources associated with the proposed California State University/San Diego State University (CSU/SDSU) Imperial Valley Campus Brawley Sciences Building Project (project or proposed project), located east of Brawley, California. This technical memorandum provides the results of the biological resources investigation.

1 Project Location and Setting

The project is located at 560 California State Route (SR) 78 (also referred to as Ben Hulse Highway) in Imperial County, east of the city of Brawley (see Figure 1, Regional/Campus Location). Regional access to the campus is provided by SR 111 and SR 86 to the west and northwest, respectively, and SR 115 to the east. The 1.5-acre project site boundary plus an additional 100-foot survey buffer (study area), totaling 7.5 acres, was assessed in this technical memo. The project is surrounded by agricultural uses to the north, south, and west; undeveloped land and a solar farm are located directly east of the proposed project site. The proposed sciences building would be constructed northeast of existing campus Building 101 and associated parking lot (see Figure 2). Project construction staging areas would be located southeast of the project site and north of SR 78 (see Figure 2).

2 Project Description

In September 2003, CSU certified an environmental impact report and approved a Campus Master Plan for development of the SDSU Brawley Campus (Brawley campus or campus), which would serve as an extension of the existing SDSU Imperial Valley Campus (IVC) located in Imperial County. The IVC is an extension of SDSU's main campus located in San Diego and furthers the university's regional educational mission to provide additional educational opportunities to the outlying communities of Imperial County. The approved Campus Master Plan and certified environmental impact report (EIR) provided sufficient environmental analysis and authorization necessary for enrollment of up to 850 full-time equivalent (FTE) students and corresponding faculty and staff, and a framework for development of the facilities necessary to serve the approved campus enrollment.

The Brawley campus is approximately 200 acres in size and is located east of the city of Brawley (city). Currently, the campus has been partially built out with educational and support facilities, although much of the campus remains undeveloped or used for active agriculture. As noted above, the environmental impacts associated with development of the Brawley campus, including a student enrollment up to 850 FTE, were evaluated at a program level of review in the previously certified 2003 SDSU Imperial Valley Campus Master Plan Project EIR (2003 EIR) (SCH 200251010). In CSU's effort to build out the IVC consistent with the previously approved Campus Master Plan, SDSU now proposes construction and operation of a sciences building that would be located on the Brawley campus.

The proposed project involves the construction and operation of a STEM building (science, technology, engineering, and mathematics) that would house teaching labs, lecture spaces, faculty/administration offices, research spaces, and conference rooms, as well as mechanical, electrical, and telecom support spaces. The proposed project does not include/propose any increase in the previously authorized and approved maximum student enrollment of 850 FTE.

The proposed project site is approximately 3.2-acres in size and the construction staging areas would occupy approximately 1-acre in the area of campus located southeast of the site and north of SR 78. The project includes 61,119 sf of on-site landscaping, including the construction of bio-retention areas to capture stormwater runoff from stormwater drainages systems that will be located throughout the project site. Hardscape improvements will include 41,297 sf of sidewalks and pedestrian walkways, which will connect the project site to existing campus buildings and parking lot.

Additionally, the project will require new points of connection to domestic water, fire water, and sewer lines from existing utility lines to serve the new building, as well as new domestic water line infrastructure. Potable water will be provided by the city of Brawley, as well as sewer and wastewater collection services. New utility infrastructure will also be required to support electrical services for the building, as well as a back-up diesel operated generator.

The proposed project building would have an area of 36,900 gross sf and would be approximately 35 feet in height. The project is projected to be built over the course of 19 months, with construction estimated to begin in January 2024. Construction and equipment staging would require 1-acre of space within the campus, directly east of the existing building (Building 101) and parking lot. The project would involve site preparation, grading, and excavation associated with project construction. Excavation depths are anticipated to be 2 to 5 feet. Waste (i.e., excavated gravel/soil) generated during project construction would be balanced within the site.

3 Analysis Methodology

The analysis presented here considers the potential environmental impacts of the proposed project relative to existing conditions. Establishment of the project site's existing biological resource conditions has been prepared using information contained in the previously certified 2003 SDSU Imperial Valley Campus Master Plan EIR (SDSU 2003), in addition to the following methods, described below.

3.1 Literature Review

For this biological resources assessment, "special-status" species are those that are (1) listed, proposed for listing, or candidates for listing as threatened or endangered under the federal Endangered Species Act; (2) listed or candidates for listing as threatened or endangered under the California Endangered Species Act; (3) a state fully protected species; (4) a California Department of Fish and Wildlife Species of Special Concern; (5) a United States Fish and Wildlife Service Bird of Conservation Concern; or (6) a species listed on the California Native Plant Society Inventory of Rare and Endangered Plants with a California Rare Plant Rank of 1B or 2B.

Other special-status biological resources considered include sensitive vegetation communities. Sensitive vegetation communities are those communities identified as high priority for inventory in the List of Vegetation Alliances and Associations (CDFW 2023a) by a state rarity rank of S1, S2, or S3.

Special-status biological resources potentially present in the work area were identified through a literature search using the California Department of Fish and Wildlife's (CDFW) California Natural Diversity Database (CDFW 2023b), the California Native Plant Society Rare Plant Inventory (CNPS 2023), and the CDFW Information for Planning and Consultation (IPaC 2023). The National Wetlands Inventory (USFWS 2023b), the National Hydrology Database (USGS 2023), and the NRCS's Web Soil Survey databases (USDA 2023b) were also referenced to determine the presence of potential wetlands or other aquatic features on-site. Searches were completed for the Alamorio USGS 7.5-minute quadrangle, within which the project is located, and the eight surrounding quadrangles.

3.2 Field Reconnaissance

Dudek Biologist, Zarina Pringle, conducted a general biological reconnaissance survey and examined the project site and study area for the presence of potential jurisdictional features on February 16, 2023, from 11am to 4pm (see Attachment B, Site Photographs). The survey was conducted when cloud cover was 20% to 30%, wind was 1-4 miles per hour, and temperatures ranged from 60°F to 66°F. The biological survey was conducted on foot.

All native and naturalized plant species encountered within the survey area were identified and recorded. The potential for special-status plant and wildlife species to occur within the project was evaluated based on the observed vegetation communities, soils present, elevation, and surrounding landscape features. Vegetation communities and land covers were mapped directly in the field. An informal examination of jurisdictional features was conducted to evaluate potential jurisdictional waters regulated under the federal Clean Water Act, California Fish and Game Code, and Porter-Cologne Water Quality Act, and is discussed in the results section of this report.

Latin and common names for plant species with a California Rare Plant Rank follow the California Native Plant Society's Inventory of Rare and Endangered Plants (CNPS 2023). For plant species without a California Rare Plant Rank, Latin names follow the Jepson Interchange List of Currently Accepted Names of Native and Naturalized Plants of California (Jepson Flora Project 2023), and common names follow the U.S. Department of Agriculture's Natural Resources Conservation Service Plants Database (USDA 2023a). Vegetation mapping was conducted in accordance with the 2010 CDFG List of Vegetation Alliances and Associations (or Natural Communities List). The list is based on Sawyer et al.'s 2009 Manual of California Vegetation, which is the California expression of the National Vegetation Classification system. Latin and common names of animals follow Crother (2017) for reptiles and amphibians, the American Ornithologists' Union (AOU 2021) for birds, the Mammal Diversity Database (ASM

2021) for mammals, the North American Butterfly Association (NABA 2001) for butterflies, and Moyle (2002) for fish.

Dudek used geographic information system (ArcGIS) software to map biological resources and prepare associated illustrative figures.

3.3 Survey Limitations

Vegetation mapping was conducted during the day and during months of the year when most perennials would have been evident or identifiable.

Notes were taken for incidental wildlife observations made during the survey to establish a general baseline of wildlife diversity within the study area.

The current survey effort provides an accurate representation of the potential for special-status species to occur in the study area. The on-site investigation was thorough and comprehensive, and the results of the study contained herein provide a reasonable, accurate assessment of the study area.

4 Biological Resources

4.1 Existing Conditions

The proposed project site consists of developed land, disturbed habitat, and general agriculture areas. Developed areas are characterized by existing campus structures and parking lot, agriculture infrastructure, storage, irrigation ditches, and a shaded seating area. Disturbed habitat consists of graded areas adjacent to structures and a dirt road in the northern portion of the site. Additionally, a portion of an active agriculture field lies in the northern portion of the project site.

4.2 Soils

The Imperial soil series is the only soil series present within the study area (Figure 3, Soils Map) and is described in detail below.

Imperial soils are found on level to gently sloping flood plains and in old lakebeds at elevations of 235 feet below sea level to 300 feet above mean sea level. These soils formed in calcareous alluvium from mixed sources. The climate is arid with hot dry summers and cool dry winters. Average annual precipitation is less than 4 inches. Imperial soils are used for irrigated agriculture and unirrigated native desert plants. Irrigated common crops are cotton, sugar beets, barley, annual ryegrass, and where salinity is not too high, alfalfa, sorghums, flax, safflower, and winter vegetables. Vegetation on uncultivated areas consists of sparse growth of saltbush, creosote bush, *Sueda* sp., and *Allenrolfea* sp.; mesquite and *Tamarix* sp. grow where their roots can reach ground water. Imperial silty clay, was mapped within the study area (USDA 2023b).

4.3 Vegetation Communities and Land Covers

The following vegetation communities and land cover types were observed within the study area: disturbed habitat, and urban/developed land, and general agriculture. These were identified and mapped within the study area based on general characteristics. Figure 4, Biological Resources Map, illustrates the distribution of vegetation communities and land covers, and Table 1 provides a summary of each land cover's extent within the study area.

Table 1. Vegetation Communities/Land Covers in the Study Area

Vegetation Communities and Land Cover Types	Acreage
Disturbed Habitat	3.39
Urban/Developed Land	2.55
General Agriculture	1.57
Total	**7.51**

* Totals may not add due to rounding.

4.3.1 Disturbed Habitat

Disturbed habitats are areas that have been physically disturbed and are no longer recognizable as a native or naturalized vegetation association. These areas may continue to retain soil substrate. If vegetation is present, it is almost entirely composed of non-native vegetation, such as ornamentals or ruderal exotic species. Examples of these areas may include graded landscapes or areas, graded firebreaks, graded construction pads, temporary construction staging areas, off-road-vehicle trails, areas repeatedly cleared for fuel management, or areas that are repeatedly used in ways that prevent revegetation (e.g., parking lots, trails that have persisted for years).

Disturbed habitat occurs throughout the study area, comprising dirt roads and areas adjacent to structures and the paved parking lot. Ruderal vegetation species were observed growing in patches primarily in the eastern portion of the study area during the time of the survey, interspersed among patches of exposed soils. However, the majority of disturbed habitat within the study area consisted of bare soil recently cleared of vegetation.

4.3.2 Urban/Developed Land

Urban/developed land refers to areas that have been constructed on or disturbed so severely that native vegetation is no longer supported. Urban/developed lands includes areas with permanent or semi-permanent structures, pavement or hardscape, landscaped areas, and areas with a large amount of debris or other materials.

Urban/developed lands within the study area consist of existing SDSU buildings and the paved parking lot in the western portion of the study area, and agriculture related infrastructure, irrigation ditches, and storage in the eastern and northern portions.

4.3.3 General Agriculture

Agricultural lands are an anthropogenic land cover and are not described in CDFW (2023) or CNPS (2023). Within the study area, agricultural lands consist of an active alfalfa field. On-site farming practices include soil plowing, mowing, and regular anthropogenic maintenance and disturbance associated with ongoing management actions.

General agriculture area makes up a large area in the northern portion of the study area.

4.4 Floral Diversity

A total of 9 species of vascular plants (2 natives and 7 non-natives) were recorded within the study area. The low plant diversity reflects the study area's small size and its proximity to surrounding agricultural development. Plant species observed within the study areas are listed in Attachment C, Vascular Plant Species Compendium.

4.5 Wildlife Diversity

A total of 8 bird species were detected within the study area including vermillion flycatcher (*Pyrocephalus rubinus*), savannah sparrow (*Passerculus sandwichensis*), killdeer (*Charadrius vociferus*), and black phoebe (*Sayornis nigricans*). No bird nests were observed within the study area. Two nests which appeared to be inactive were observed in ornamental trees in a parking lot outside of the study area. No reptile, mammal, or amphibian species were observed. Wildlife species observed within the study areas are listed in Attachment D, Wildlife Species Compendium.

4.6 Special-Status Plants

No plant species listed or proposed for listing as rare, threatened, or endangered by either CDFW or the U.S. Fish and Wildlife Service were detected within the study area. The study area is not within any designated federally designated Critical Habitat for any special-status plant species (USFWS 2023a).

Based on the results of the literature review and database searches, 8 special-status plant species have been documented within the region. All of these species were evaluated for potential to occur within the study areas, see Attachment E, Special-Status Plant Species Potential to Occur. Criteria used include soils, current disturbance levels, vegetation communities present, elevation ranges, and previous known locations based on the California Natural Diversity Database (CDFW 2023b), California Native Plant Society (CNPS 2023), and Consortium of California Herbaria (Calflora 2023) records.

There are no federally or state-listed as endangered plant species with potential to occur in the study area. Due to the limited size of the study area, elevation range, and prevalence of disturbed and non-native cover, as well as absence of suitable habitat, all non-listed special status plant species are not expected to occur within the study area.

4.7 Special Status Wildlife

No wildlife species listed or proposed for listing as rare, threatened, or endangered by either CDFW or the U.S. Fish and Wildlife Service were detected within the study area. The study area is not within any federally designated Critical Habitat for any special-status wildlife species (USFWS 2023a).

Based on the results of the literature review and database searches, 18 special-status species have been documented within the region, see Attachment F, Special-Status Wildlife Species Potential to Occur. For each species listed, a determination was made regarding potential use of the study area based on information gathered during the field reconnaissance, known habitat preferences, and knowledge of the species' relative distributions in the area.

Vermillion flycatcher, a Species of Special Concern, was observed on site during the February 2023 biological reconnaissance survey. The mountain plover (*Charadrius montanus)* has a high potential to occur within the study area; the burrowing owl (*Athene cunicularia*) has a moderate potential to occur within the study area. American badger (*Taxidea taxus*) has a low potential to occur within the study area. Due to the limited size of the study area, location in an agriculturally developed setting, prevalence of disturbed and developed areas, and absence of suitable habitat within the study area, all other special-status wildlife species were not expected to occur within the study area.

Besides those species listed or proposed for listing as rare, threatened, or endangered, the study area has the potential to support nesting bird species which are protected under the Migratory Bird Treaty Act.

4.8 Jurisdictional Waters

During the general biological reconnaissance survey conducted in February 2023, two irrigation ditches associated with local agriculture were documented within the study area. These ditches are excavated, upland-cut features dug solely for the purpose of draining surrounding lands and/or facilitating irrigation activities; as such they would not be federally regulated by the USACE. These features may be considered waters of the state, under the jurisdiction of the CDFW and RWQCB.

Additionally, no areas potentially supporting vernal pools, ephemeral ponds, or wetlands were observed during the survey.

5 Impact Analysis and Conclusions

5.1 Thresholds of Significance

The thresholds of significance used to evaluate the impacts of the proposed project related to biological resources are based on Appendix G of the CEQA Guidelines (Cal. Code Regs., Title 14, Chptr. 3, sections 15000-15387.). A significant impact under CEQA would occur if the proposed project would:

a) Have a substantial adverse effect, either directly or through habitat modifications, on any species identified as a candidate, sensitive, or special status species in local or regional plans, policies, or regulations, or by the California Department of Fish and Wildlife or U.S. Fish and Wildlife Service.

b) Have a substantial adverse effect on any riparian habitat or other sensitive natural community identified in local or regional plans, policies, regulations, or by the California Department of Fish and Wildlife or U.S. Fish and Wildlife Service.

c) Have a substantial adverse effect on state or federally protected wetlands (including, but not limited to, marsh, vernal pool, coastal, etc.) through direct removal, filling, hydrological interruption, or other means.

d) Interfere substantially with the movement of any native resident or migratory fish or wildlife species or with established native resident or migratory wildlife corridors, or impede the use of native wildlife nursery sites.

e) Conflict with any local policies or ordinances protecting biological resources, such as a tree preservation policy or ordinance.

f) Conflict with the provisions of an adopted Habitat Conservation Plan, Natural Community Conservation Plan, or other approved local, regional, or state habitat conservation plan.

5.2 Impact Analysis

a) Would the project have a substantial adverse effect, either directly or through habitat modifications, on any species identified as a candidate, sensitive, or special status species in local or regional plans, policies, or regulations, or by the California Department of Fish and Wildlife or U.S. Fish and Wildlife Service?

Potential impacts of the Campus Master Plan related to species listed as candidate, sensitive, or special status were evaluated in Section 3.4, Biological Resources, of the certified 2003 EIR. Chapter 11 of the EIR includes a mitigation measure in the MMRP which addresses the need to adhere to recommended mitigation protocols for the burrowing owl (*Athene cunicularia*), a migratory bird protected under the MBTA (page 11-2)[1]. The mitigation includes prescriptions for relocation prior to construction and subsequent monitoring activities. The EIR concluded impacts would be less than significant with the mitigation.

Based on the current analysis, the study area contains trees, shrubs, and bare ground that would potentially be used by migratory birds for breeding. Direct impacts to migratory nesting birds must be avoided to comply with the MBTA and California Fish and Game Code. Indirect impacts to nesting birds from short-term, construction-related noise could result in decreased reproductive success or abandonment of an area as nesting habitat if construction were conducted during the breeding/nesting season (i.e., January through August). Therefore, direct and indirect impacts to nesting birds would be significant absent mitigation. Implementation of recommended mitigation measure BIO-1 (see below) would ensure nesting

1 **3.4 Biological Resources Mitigation Measure** included on Page 11-2 of the 2003 EIR: (1) The following recommended mitigation protocol, taken from the CDFG Staff Report on Burrowing Owl Mitigation, shall be followed if passive relocation with one-way doors is chosen: “Owls should be excluded from burrows in the immediate impact zone and within a 50-meter (approximately 160 feet) buffer zone by installing one-way doors in burrow entrances. One-way doors (e.g., modified dryer vents) should be left in place 48 hours to insure owls have left the burrow before excavation. Two natural or artificial burrows should be provided for each burrow in the project area that will be rendered biologically unsuitable. The project area should be monitored daily for one week to confirm owl use of burrows before excavating burrow in the immediate impact zone. Whenever possible; burrows should be excavated by hand tools and refilled to prevent reoccupation. Sections of flexible plastic pipe should be inserted into the tunnels during excavation to maintain an escape route for any animals inside the burrow.” If burrowing owls are encountered. CDFG will be consulted to ensure the appropriate measures are taken.

birds would not be impacted by project construction activities during nesting season. As such, impacts to nesting birds would be **less than significant.**

In addition, Burrowing owl is a Species of Special Concern and has a moderate potential to occur in the study area. As such, project implementation could result in direct impacts on burrowing owl in the form of habitat destruction, and potential death, injury, or harassment of nesting birds, their eggs, and their young. Injury or mortality occurs most frequently during the vegetation clearing stage of construction and affects eggs, nestlings, and recently fledged young that cannot safely avoid equipment. Indirect impacts to burrowing owl include vibration, excess noise, chemical pollution, fugitive dust, and increased human presence. Direct and indirect impacts to burrowing owl specific to construction of the proposed project therefore would be potentially significant, absent additional mitigation beyond the general mitigation previously adopted as part of the 2003 EIR. However, these impacts would be avoided and minimized through implementation of recommended mitigation measure BIO-2 (see below). This mitigation measure requires pre-construction surveys, establishment of exclusion buffers around occupied burrows or burrow complexes (buffer width is dependent upon breeding versus non-breeding season), and burrowing owl specific monitoring throughout construction to ensure full avoidance of owls. Should it be determined that full avoidance of occupied burrowing owl burrows or burrow complexes is not possible, mitigation measure BIO-2 requires preparation of a Burrowing Owl Relocation and Mitigation Plan that would include methods for passive relocation; description of surrounding suitable habitat conditions; monitoring and management requirements for replacement burrow sites in coordination with CDFW; reporting requirements; and compensatory mitigation, if required by CDFW. With implementation of mitigation measure BIO-2, impacts to burrowing owl would be **less than significant.**

BIO-1: Pre-Construction Nesting Bird Survey. If ground disturbance and/or vegetation clearance activities are scheduled to occur during the avian nesting season (February 15th to August 30th), SDSU, or its designee, shall retain a biologist to conduct a pre-construction nesting bird survey within the area to be disturbed and a 500-foot-buffer. Surveys should be conducted within 3 days prior to initiation of activity between dawn and noon.

If construction begins outside the nesting bird season (i.e., between August 31st and February 14th), work may procced without a nesting bird survey. If construction begins outside the nesting season, but crosses into the nesting season (i.e., start in January but work until March), construction activities may proceed without a nesting bird survey. However, anytime construction must pause for more than 72-hours during the nesting season, an updated nesting bird survey should be conducted prior to the resumption of construction activities.

If an active nest is detected during the nesting bird survey, avoidance buffers shall be implemented as determined by a biologist retained by SDSU. The buffer should be of sufficient distance to ensure avoidance of adverse effects to the nesting bird by accounting for topography, ambient conditions, species, nest location, and activity type. All nests shall be monitored as determined by the biologist until nestlings have fledged and dispersed, or it is confirmed that the nest has been unsuccessful or abandoned.

BIO-2: Burrowing Owl Avoidance and Relocation. Prior to the initiation of construction activities, SDSU, or its designee, shall retain a biologist to conduct a pre-construction survey for burrowing owl to determine the presence/absence of the species. SDSU shall submit at least one burrowing owl pre-construction survey report to the satisfaction of CDFW to document compliance with this mitigation measure. For the purposes of this mitigation measure, "qualified biologist" is a biologist who meets the requirements set forth in the California Department of Fish & Wildlife (CDFW) Staff Report on Burrowing Owl Mitigation (CDFW 2012).

The survey shall be conducted within 30 days of site disturbance in accordance with the most current and applicable CDFW protocol. If burrowing owls are not detected during the survey, no additional surveys or mitigation is required. Preconstruction surveys shall observe suitable burrowing owl habitat within the Project footprint and within 500 feet of the Project footprint (or within an appropriate buffer as required in the most recent guidelines and where legal access to conduct the survey exists).

Nesting Season Observation

If burrowing owl is located during the survey, occupied burrowing owl burrows shall not be disturbed during the nesting season (February 1 through August 31) unless a biologist approved by CDFW verifies through non-invasive methods that either the birds have not begun egg laying and incubation, or that juveniles from the occupied burrows are foraging independently and capable of independent survival. If occupied burrows are present during the nesting season, construction activities may commence, or resume as applicable, after non-disturbance buffers are implemented by a biologist in accordance with the recommendations included in the Staff Report on Burrowing Owl Mitigation (CDFW 2012). If burrows are present, the biologist shall be contracted to perform monitoring during all construction activities approximately every other day. However, the definitive frequency and duration of monitoring shall be dependent on whether it is the breeding versus non-breeding season and the efficacy of the disturbance buffers, as determined by the biologist and in coordination with CDFW.

Non-Breeding/Non-Nesting Observation

If burrowing owl is detected during the non-breeding/non-nesting season (September 1 through January 31) or if confirmed to not be nesting, a non-disturbance buffer between the project activities and the occupied burrow shall be installed by a qualified biologist in accordance with the recommendations included in the Staff Report on Burrowing Owl Mitigation (CDFW 2012). However, under these circumstances, monitoring by the biologist is not required.

Avoidance Not Possible Through Non-Disturbance Buffers

If avoidance is not possible through the installation of non-disturbance buffers, SDSU, or its designee, shall prepare a Burrowing Owl Relocation and Mitigation Plan for submittal and approval by CDFW. Once approved, the Plan would be implemented to relocate burrowing owls from the Project site.

b) ***Would the project have a substantial adverse effect on any riparian habitat or other sensitive natural community identified in local or regional plans, policies, regulations, or by the California Department of Fish and Wildlife or U.S. Fish and Wildlife Service?***

The 2003 Initial Study (IS) prepared for the Campus Master Plan EIR determined that no impact related to adverse effects on riparian habitat or other sensitive natural communities would occur.

The study area does not contain riparian vegetation communities or any vegetation communities identified as sensitive according to CDFW. As a result, **no impacts** to sensitive communities are expected to occur.

c) ***Would the project have a substantial adverse effect on state or federally protected wetlands (including, but not limited to, marsh, vernal pool, coastal, etc.) through direct removal, filling, hydrological interruption, or other means?***

The IS prepared for the Campus Master Plan 2003 EIR determined that no impact related to adverse effects on wetlands would occur.

The project site does not contain wetland waters of the United States or State. The study area contains potential non-wetland waters of the United States and non-wetland waters of the State; however, all features are located outside of the project footprint and direct impacts would be avoided. Indirect short-term impacts to jurisdictional waters include changes to hydrology, erosion, chemical pollution, and fugitive dust, and substantial long-term impacts include hydrology alterations and chemical pollution. Indirect impacts to jurisdictional waters would be significant without mitigation. Mitigation measure-BIO-3 requires that the work limits are appropriately flagged, and that equipment and spoil sites are placed in uplands within the proposed development area. Implementation of mitigation measure BIO-3 would reduce potential indirect impacts to jurisdictional waters outside of the project footprint to a **less-than-significant** level.

BIO-3: General Avoidance and Minimization Measures. SDSU, or its designee, shall implement the following measures during project construction activities to avoid indirect impacts to aquatic resources:

- Construction limits should be clearly flagged so that adjacent native vegetation is avoided.
- Construction work and operations and maintenance areas should be kept clean of debris, such as trash and construction materials. Fully covered trash receptacles that are animal-proof should be installed and used during construction to contain all food, food scraps, food wrappers, beverage containers, and other miscellaneous trash. Trash contained within the receptacles should be removed from the work area at least once a week.
- Staging and storage areas for spoils, equipment, materials, fuels, lubricants, and solvents should be located within the designated impact area or adjacent developed areas.
- Best management practices should be implemented to ensure water quality in existing drainages would not be affected during project activities.

d) ***Would the project interfere substantially with the movement of any native resident or migratory fish or wildlife species or with established native resident or migratory wildlife corridors, or impede the use of native wildlife nursery sites?***

The IS prepared for the Campus Master Plan 2003 EIR determined that no impact related to wildlife movement or migration would occur.

The project site is not located within an area that functions as a wildlife movement or migration corridor. As such, the proposed project would not constrain natural wildlife movement in its vicinity and **no impact** would occur.

e) ***Would the project conflict with any local policies or ordinances protecting biological resources, such as a tree preservation policy or ordinance?***

The IS prepared for the Campus Master Plan 2003 EIR determined that no impact related to conflicts with local biological resources policies or ordinances would occur.

As proposed, the project would not conflict with any local policies or ordinances protecting biological resources. Therefore, **no impact** would occur to any biological resources protected by a local ordinance.

f) ***Would the project conflict with the provisions of an adopted Habitat Conservation Plan, Natural Community Conservation Plan, or other approved local, regional, or state habitat conservation plan?***

The IS prepared for the Campus Master Plan 2003 EIR determined that no impact related to conflicts with local biological resources policies or ordinances would occur.

There are no habitat conservation or natural community plans that have been implemented for the project area. The Imperial Irrigation District developed a planning agreement in 2006 for a regional HCP, however that plan is still in development and has not been implemented. As such, the project would not conflict with any applicable plans and **no impact** would occur.

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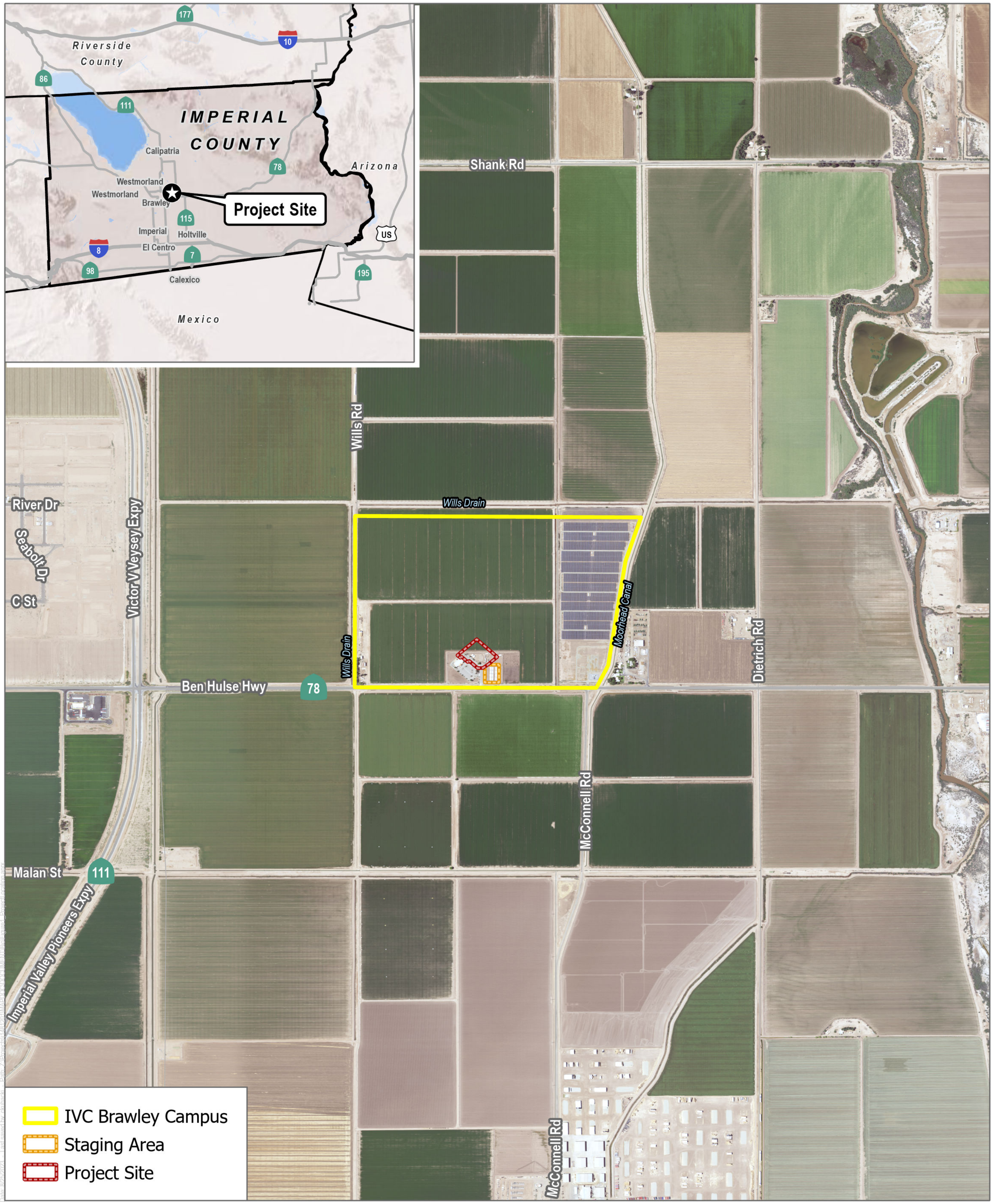
Attachment A
Figures 1-4



SOURCE: NAIP 2020, Open Streets Map 2019

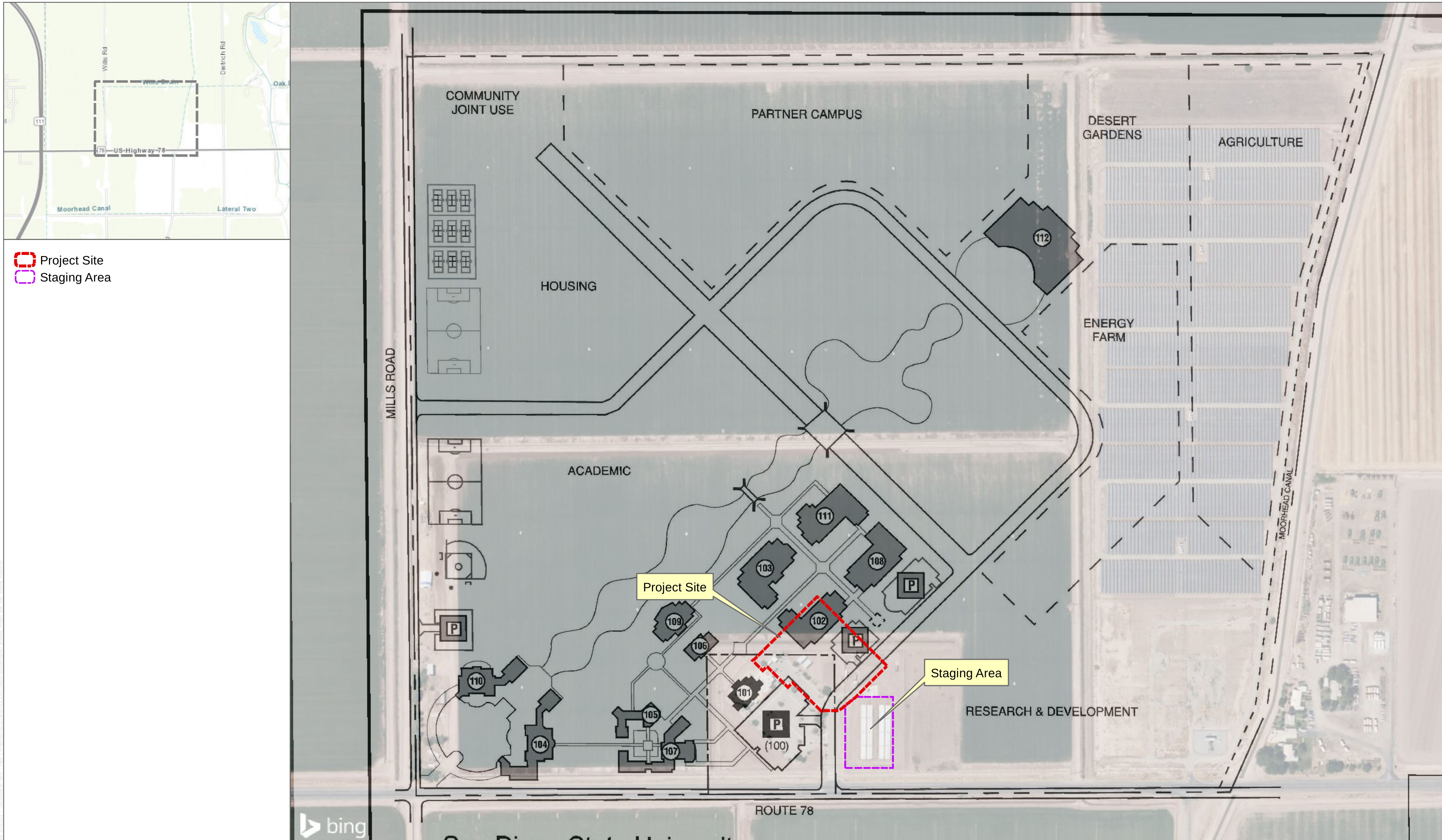
DUDEK

0 1,000 2,000 Feet

FIGURE 1

Project Location

SDSU Brawley Sciences Building Project



SOURCE: AERIAL-BING MAPPING SERVICE 2022; CAMPUS MASTER PLAN 2003

DUDEK

0 175 350 Feet

FIGURE 2

SDSU Brawley Project Site and Staging Area

SDSU Brawley Sciences Building Project

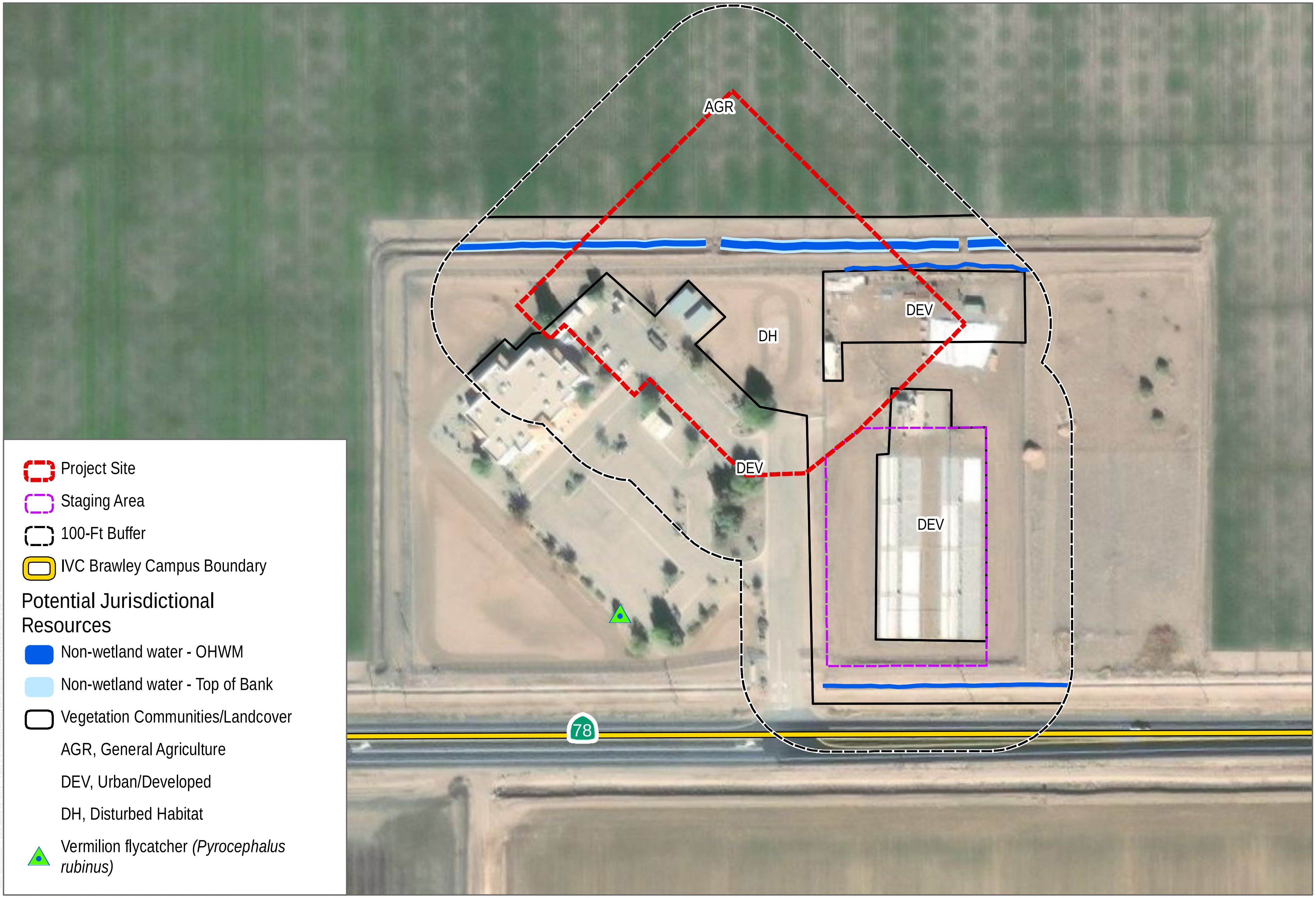
SOURCE: AERIAL-ESRI IMAGERY SERVICE 2022; SOILS- USDA

DUDEK

FIGURE 3

Soils Map

SDSU Brawley Sciences Building Project



SOURCE: AERIAL-ESRI IMAGERY SERVICE 2021; SOILS- USDA

DUDEK

0 75 150
Feet

FIGURE 4

Biological Resources Map

SDSU Brawley Sciences Building Project

Attachment B
Site Photographs

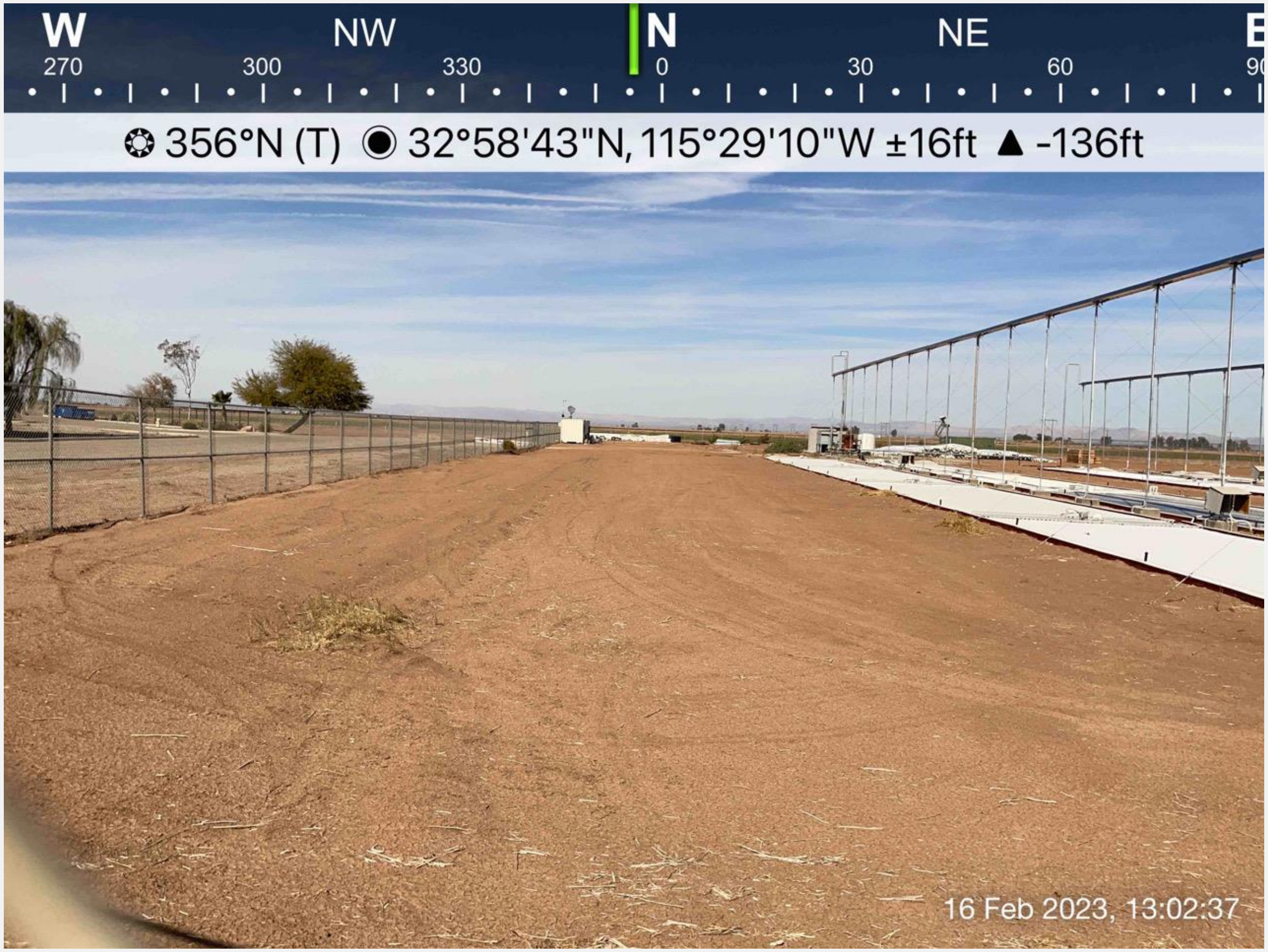


Photo 1: View of disturbed habitat in the project equipment staging area in the southeastern portion of the study area, facing north.

Photo 2: View of dirt road and disturbed habitat in the eastern portion of the study area, facing south.

Photo 3: View of dirt road, chain link fence, and storage area in the northwestern portion of the study area, facing east.

Photo 4: View of shaded seating area and disturbed habitat in the central portion of the study area.

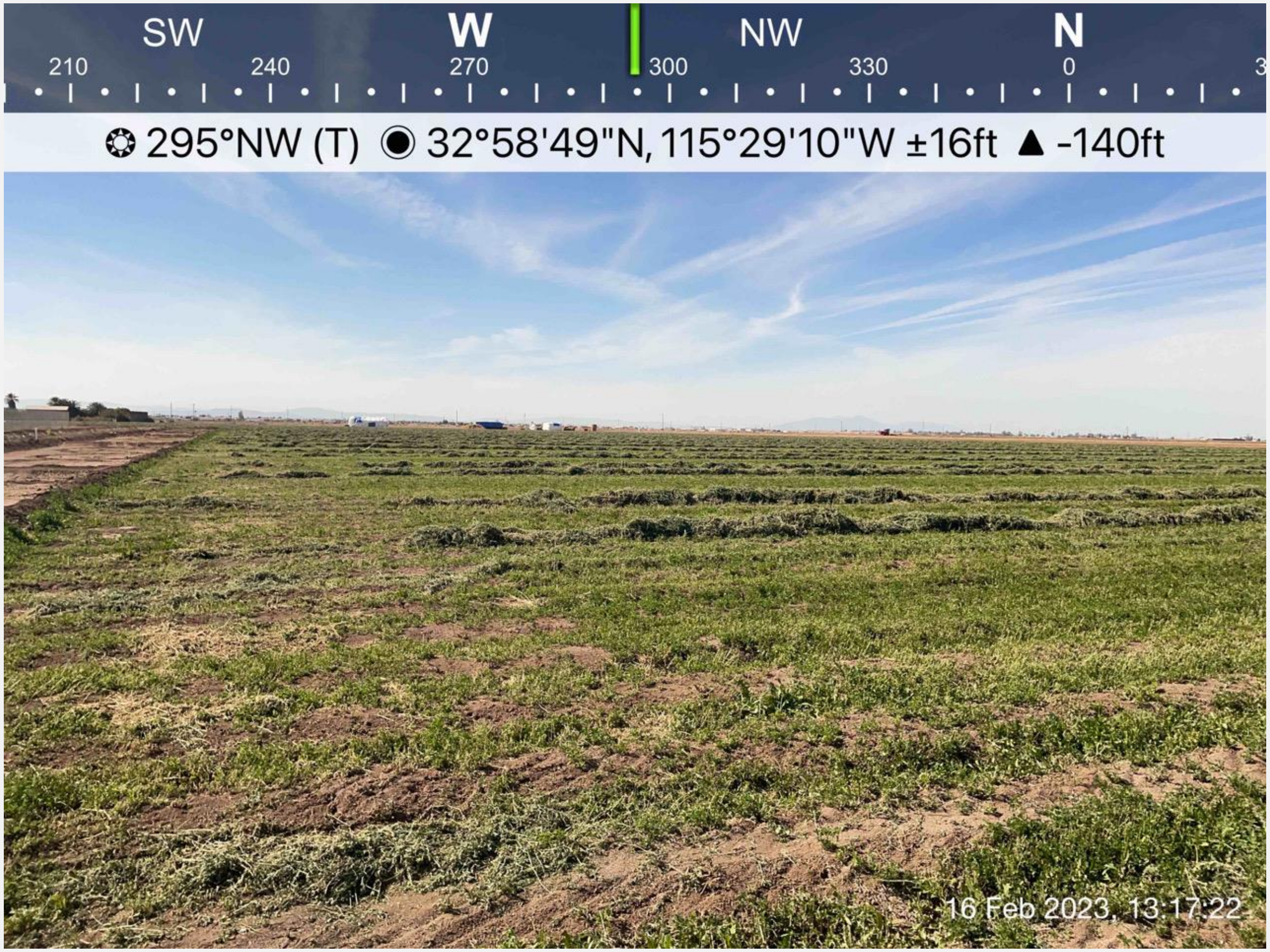


Photo 5: View of mowed agriculture field in the northern portion of the study area.

Photo 6: View of agriculture in the northern portion of the study area, facing south.

Photo 7: View of disturbed habitat and ornamental trees in the northern portion of the study area, facing southeast.

Photo 8: View of earthen irrigation ditch in the northern portion of the study area, facing west.

Photo 9: View of cement irrigation ditch in the southern portion of the study area, facing west.

Attachment C
Vascular Plant Species Compendium

Plant Species

Angiosperms (Dicots)

ASTERACEAE—SUNFLOWER FAMILY

Lactuca serriola—prickly lettuce*

Sonchus oleraceus—common sowthistle*

CHENOPODIACEAE—GOOSEFOOT FAMILY

Atriplex lentiformis—quailbush

MALVACEAE—MALLOW FAMILY

Malva parviflora—cheeseweed mallow*

POLYGONACEAE—BUCKWHEAT FAMILY

Polygonum aviculare—prostrate knotweed*

TAMARICACEAE—TAMARISK FAMILY

Tamarix ramosissima—tamarisk*

MONOCOTS

POACEAE—GRASS FAMILY

*Avena fatua—wild oat**

Cynodon dactylon—Bermudagrass*

TYPHACEAE—CATTAIL FAMILY

Typha domingensis—southern cattail

* signifies introduced (non-native) species

Attachment D
Wildlife Species Compendium

Wildlife Species – Vertebrates

BIRDS

FRINGILLIDAE—FRINGILLINE & CARDUELINE FINCHES & ALLIES

Haemorhous mexicanus—house finch

TYRANNIDAE—TYRANT FLYCATCHERS

Pyrocephalus rubinus—vermilion flycatcher

Sayornis nigricans—black phoebe

CATHARTIDAE—NEW WORLD VULTURES

Cathartes aura—turkey vulture

PASSERIDAE—OLD WORLD SPARROWS

Passer domesticus—house sparrow*

COLUMBIDAE—PIGEONS & DOVES

Zenaida macroura—mourning dove

CHARADRIIDAE—LAPWINGS & PLOVERS

Charadrius vociferus—killdeer

PASSERELLIDAE—NEW WORLD SPARROWS

Passerculus sandwichensis—savannah sparrow

* signifies introduced (non-native) species

Attachment E

Special-Status Plant Species Potential to Occur

Scientific Name	Common Name	Status (Federal/State/CRPR)	Primary Habitat Associations/ Life Form/ Blooming Period/ Elevation Range (feet)	Potential to Occur
Astragalus magdalenae var. *peirsonii*	Peirson's milk-vetch	FT/SE/1B.2	Desert dunes/perennial herb/Dec–Apr/195–740	**Not expected to occur.** The study area is outside of the species' known elevation range and there is no suitable desert dune habitat present to support this species.
Croton wigginsii	Wiggins' croton	None/SR/2B.2	Desert dunes, Sonoran desert scrub/perennial shrub/Mar–May/165–330	**Not expected to occur.** The study area is outside of the species' known elevation range and there is no suitable desert dune habitat or Sonoran Desert scrub vegetation present to support this species.
Euphorbia abramsiana	Abrams' spurge	None/None/2B.2	Mojavean desert scrub, Sonoran desert scrub; Sandy/annual herb/(Aug)Sep–Nov/-15–4,295	**Not expected to occur.** The study area is outside of the species' known elevation range and there is no suitable vegetation present to support this species.
Helianthus niveus ssp. *tephrodes*	Algodones Dunes sunflower	None/SE/1B.2	Desert dunes/perennial herb/Sep–May/165–330	**Not expected to occur.** The study area is outside of the species' known elevation range and there is no suitable desert dune habitat present to support this species.
Nemacaulis denudata var. *gracilis*	slender cottonheads	None/None/2B.2	Coastal dunes, Desert dunes, Sonoran desert scrub/annual herb/(Mar)Apr–May/-,165–1,310	**Not expected to occur.** While the study area is within the species known elevation range, there is no suitable desert dune habitat or vegetation present to support this species.
Palafoxia arida var. *gigantea*	giant spanish-needle	None/None/1B.3	Desert dunes/annual/perennial herb/Feb–May/50–330	**Not expected to occur.** The study area is outside of the species' known elevation range and there is no suitable desert dune habitat present to support this species.
Panicum hirticaule ssp. hirticaule	roughstalk witch grass	None/None/2B.1	Desert dunes, Joshua tree "woodland", Mojavean desert scrub, Sonoran desert scrub; Sandy, Silt/annual herb/Aug–Dec/150–4,310	**Not expected to occur.** The study area is outside of the species' known elevation range and there is no suitable desert dune habitat or vegetation present to support this species.

Scientific Name	Common Name	Status (Federal/State/CRPR)	Primary Habitat Associations/ Life Form/ Blooming Period/ Elevation Range (feet)	Potential to Occur
Pholisma sonorae	sand food	None/None/1B.2	Desert dunes, Sonoran desert scrub/perennial herb (parasitic)/(Mar)Apr–June/0–655	**Not expected to occur.** The study area is outside of the species' known elevation range and there is no suitable desert dune habitat or vegetation present to support this species.

Known to occur: the species has been documented on the project site by a reliable source.

High potential to occur: the species has not been documented on the project site but is known to recently occur in the vicinity and suitable habitat is present.

Moderate potential to occur: the species has not been documented on the project site or in the vicinity, but the site is within the known range of the species and suitable habitat for the species is present.

Low potential to occur: the species has not been documented on the project site or in the vicinity, but the site is within the known range of the species; however, suitable habitat for the species onsite is of low quality.

Not expected to occur: the project site is outside the known geographic or elevational range of the species and/or the site does not contain suitable habitat for the species.

Status Legend:

FT: Federally listed as threatened
SE: State listed as endangered
SR: State Rare
CRPR 1B: Plants rare, threatened, or endangered in California and elsewhere
CRPR 2B: Plants rare, threatened, or endangered in California but more common elsewhere
.1 Seriously threatened in California (over 80% of occurrences threatened / high degree and immediacy of threat)
.2 Moderately threatened in California (20–80% occurrences threatened / moderate degree and immediacy of threat)
.3 Not very threatened in California (<20% of occurrences threatened / low degree and immediacy of threat or no current threats known)
CBR: Considered but Rejected

References:

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Attachment F
Special-Status Wildlife Species Potential to Occur

Scientific Name	Common Name	Status (Federal/State)	Habitat	Potential to Occur
Amphibians				
Incilius alvarius	Sonoran Desert toad	None/SSC	Desert and semi-arid habitats including desert scrub, semi-arid grasslands and woodlands; usually associated with large permanent streams	**Not expected to occur.** The study area lacks desert scrub vegetation and permanent streams necessary to support this species.
Lithobates pipiens (native populations only)	northern leopard frog	None/SSC	Adjacent to permanent and semi-permanent water in a range of habitats	**Not expected to occur.** The study area lacks permanent or semi-permanent water features. Additionally, the only record of this species within the 9 USGS quadrangles containing the site is a historical record from 1929 (CDFW 2023).
Birds				
Asio flammeus (nesting)	short-eared owl	BCC/SSC	Grassland, prairies, dunes, meadows, irrigated lands, and saline and freshwater emergent wetlands; nest on the ground amid grasses and low plants	**Not expected to occur.** While the study area contains irrigated agricultural areas, it lacks nesting habitat. The nearest mapped CNDDB record is approximately 8 miles northwest of the study area and is a historical record from 1956 (CDFW 2023).
Athene cunicularia (burrow sites & some wintering sites)	burrowing owl	BCC/SSC	Nests and forages in grassland, open scrub, and agriculture, particularly with ground squirrel burrows	**Moderate potential to occur.** While the study area contains agriculture areas, no suitable ground squirrel burrows were observed within the study area during the spring 2023 biological reconnaissance survey. Additionally, the agricultural field is active and regularly mowed. The nearest mapped CNDDB record is approximately 1 mile west of the study area near Brawley (CDFW 2023).
Charadrius montanus (wintering)	mountain plover	BCC/SSC	Winters in shortgrass prairies, plowed fields, open sagebrush, and sandy deserts	**High potential to occur.** The study area contains plowed fields which may provide suitable wintering habitat. The nearest mapped CNDDB record is approximately 0.5 miles southeast of the study area (CDFW 2023).

Scientific Name	Common Name	Status (Federal/State)	Habitat	Potential to Occur
Laterallus jamaicensis coturniculus	California black rail	None/FP, ST	Tidal marshes, shallow freshwater margins, wet meadows, and flooded grassy vegetation; suitable habitats are often supplied by canal leakage in Sierra Nevada foothill populations	**Not expected to occur.** The study area lacks tidal marsh, freshwater margin, wet meadow, or flooded grassy habitat necessary to support this species.
Melanerpes uropygialis	Gila woodpecker	BCC/SE	Nests and forages in Saguaro cacti, riparian woodland, and residential areas	**Not expected to occur.** There is no suitable saguaro cacti or riparian woodland nesting habitat present to support this species.
Pyrocephalus rubinus (nesting)	vermilion flycatcher	None/SSC	Nests in riparian woodlands, riparian scrub, and freshwater marshes; typical desert riparian with cottonwood, willow, mesquite adjacent to irrigated fields, ditches, or pastures	**Present.** A vermillion flycatcher was observed by a Dudek biologist during the biological reconnaissance survey in February 2023. However, the study area lacks riparian woodlands, riparian scrub, freshwater marsh, or desert riparian habitat typically utilized by this species for nesting. Therefore, this species is not expected to nest within the study area.
Rallus obsoletus yumanensis	Yuma Ridgway's rail	FE/FP, ST	Freshwater marsh dominated by Typha spp., Scirpus spp., Schoenoplectus spp., and Bolboschoenus spp.; mix of riparian tree and shrub species along the marsh edge; many occupied areas are now man-made, such as managed ponds or effluent-supported marshes	**Not expected to occur.** The study area lacks freshwater marsh habitat necessary to support this species.
Toxostoma crissale	Crissal thrasher	None/SSC	Nests and forages in desert riparian and desert wash; dense thickets of sagebrush and other shrubs such as mesquite, iron catclaw acacia, and arrowweed willow within juniper and pinyon–juniper woodlands	**Not expected to occur.** The study area lacks desert riparian, desert wash or shrub habitat necessary for nesting or foraging.
Fishes				
Xyrauchen texanus	razorback sucker	FE/FP, SE	Found in the Colorado River bordering California	**Not expected to occur.** The study area lacks surface water features necessary to support this species.
Invertebrates				

Scientific Name	Common Name	Status (Federal/State)	Habitat	Potential to Occur
Bombus crotchii	Crotch bumble bee	None/SCE	Open grassland and scrub communities supporting suitable floral resources.	**Not expected to occur.** The study area lacks open grassland and scrub communities which could support suitable floral resources.
Danaus plexippus plexippus pop. 1	monarch - California overwintering population	FC/None	Wind-protected tree groves with nectar sources and nearby water sources	**Not expected to occur.** The study area lacks wind-protected tree groves with nectar sources and nearby water sources. Additionally, most records of overwintering populations are located within proximity to the ocean, where temperatures are more moderate.
Mammals				
Dasypterus xanthinus	western yellow bat	None/SSC	Valley–foothill riparian, desert riparian, desert wash, and palm oasis habitats; below 2,000 feet above mean sea level; roosts in riparian and palms	**Not expected to occur.** The study area lacks valley–foothill riparian, desert riparian, desert wash, or palm oasis habitats necessary to support this species.
Nyctinomops macrotis	big free-tailed bat	None/SSC	Rocky areas; roosts in caves, holes in trees, buildings, and crevices on cliffs and rocky outcrops; forages over water	**Not expected to occur.** The study area lacks rocky areas, caves, or cliffs for roosting. Additionally, there are no nearby open water sources necessary for foraging.
Sigmodon hispidus eremicus	Yuma hispid cotton rat	None/SSC	Backwater sloughs, marshy areas adjacent to Colorado River	**Not expected to occur.** The study area lacks backwater sloughs or marshy areas.
Taxidea taxus	American badger	None/SSC	Dry, open, treeless areas; grasslands, coastal scrub, agriculture, and pastures, especially with friable soils	**Low potential to occur.** While the study area contains agriculture areas that may be suitable to this species, soils in the area are mapped as Imperial Silty Clay Wet (USDA 2023), which is a soil series that is not described as friable. Additionally, no burrows were observed on site during the spring 2023 biological reconnaissance survey. The nearest

Scientific Name	Common Name	Status (Federal/State)	Habitat	Potential to Occur
				mapped CNDDB record is approximately 16 miles southwest of the study area (CDFW 2023).
Reptiles				
Phrynosoma mcallii	flat-tailed horned lizard	None/SSC	Desert washes and flats with sparse low-diversity vegetation cover and sandy soils	**Not expected to occur.** The study area lacks desert wash and sandy soils. The nearest mapped CNDDB record is approximately 3 miles east of the study area in Brawley, however, this is a historical record from 1971 and is possibly extirpated (CDFW 2023).

Known to occur: the species has been documented on the project site by a reliable source.

High potential to occur: the species has not been documented on the project site but is known to recently occur in the vicinity and suitable habitat is present.

Moderate potential to occur: the species has not been documented on the project site or in the vicinity, but the site is within the known range of the species and suitable habitat for the species is present.

Low potential to occur: the species has not been documented on the project site or in the vicinity, but the site is within the known range of the species; however, suitable habitat for the species onsite is of low quality.

Not expected to occur: the project site is outside the known geographic or elevational range of the species and/or the site does not contain suitable habitat for the species.

Status Abbreviations
FE: Federally listed as endangered
FT: Federally listed as threatened
FPE: Federally proposed for listing as endangered
PFT: Federally proposed for listing as threatened

FC: Federal candidate species (former Category 1 candidates)
FPD: Federally proposed for delisting
BCC: U.S. Fish and Wildlife Service Bird of Conservation Concern
BLM: Bureau of Land Management Sensitive Species
USFS: U.S. Forest Service Sensitive Species
SSC: California Species of Special Concern
FP: California Fully Protected Species
WL: California Watch List Species
SE: State listed as endangered
ST: State listed as threatened
SC: State candidate for listing as threatened or endangered
SCE: State candidate for listing as endangered
SCT: State candidate for listing as threatened
SCD: State candidate for delisting
CDF: California Department of Forestry Sensitive Species

References:

CDFW. 2023. RareFind, Version 5.0 (commercial subscription). California Natural Diversity Database (CNDDB). Sacramento, California: CDFW, Biogeographic Branch. Accessed february 2023. http://www.dfg.ca.gov/biogeodata/cnddb/rarefind.asp.

USDA. 2023. Web Soil Survey. USDA Natural Resources Conservation Service, Soil Survey Staff. Accessed February 2023. http://websoilsurvey.nrcs.usda.gov/.

Appendix D
Cultural Resources Technical Memorandum

MEMORANDUM

To:	Michael Haberkorn, Gatzke Dillon & Ballance
From:	Keshia Montifolca, Archaeologist Dudek
Subject:	SDSU Brawley Sciences Building Project - Cultural Resources and Tribal Cultural Resources Technical Memo
Date:	August 24, 2023
cc:	Sarah Lozano, Kirsten Burrowes, Matthew DeCarlo, Dudek
Attachment(s):	A – Figures B – Site Photos C – Confidential SCIC Records Search Results D – NAHC Sacred Lands Search Results E – Assembly Bill 52 Outreach Letter Example F– Assembly Bill 52 Consultation Meeting Minutes

Dudek has conducted an evaluation pursuant to the requirements of the California Environmental Quality Act (CEQA), California Public Resources Code 21000, et seq., to determine the presence and potential impacts related to cultural resources and tribal cultural resources associated with the proposed California State University/San Diego State University (CSU/SDSU) Imperial Valley Campus Brawley Lithium Research Hub/Brawley Sciences Building Project (project or proposed project), located east of Brawley, California. This technical memorandum provides the results of the cultural and tribal resources investigation.

1 Project Location and Setting

The project is located at 560 California State Route (SR) 78 (also referred to as Ben Hulse Highway) in Imperial County, east of the city of Brawley. Regional access to the campus is provided by SR 111 and SR 86 to the west and northwest, respectively, and SR 115 to the east (see Attachment A: Figure 1, Project Location). The proposed project site is surrounded by agricultural uses to the north, south, and west. Undeveloped land and a solar farm are located directly east of the proposed project site. The proposed lithium research hub/ Brawley Sciences building would be constructed northeast of existing campus Building 101, and the associated parking lot. Project construction staging areas would occupy the area of campus located southeast of the site and north of SR 78 (see Attachment A: Figure 2, Project Area).

2 Project Description

In September 2003, CSU certified an environmental impact report (EIR) and approved a Campus Master Plan for development of the SDSU Brawley Campus (Brawley campus or campus), which would serve as an extension of the existing SDSU Imperial Valley Campus (IVC) located in Imperial County. The IVC is an extension of SDSU's main campus located in San Diego and furthers the university's regional educational mission to provide additional educational opportunities to the outlying communities of Imperial County. The approved Campus Master Plan and certified EIR provided sufficient environmental analysis and authorization necessary for enrollment of up to 850 full-time equivalent (FTE) students and corresponding faculty and staff and provided a framework for development of the facilities necessary to serve the approved campus enrollment.

The Brawley campus is approximately 200 acres in size and is located east of the city of Brawley (city). Currently, the campus has been partially built out with educational and support facilities, although much of the campus remains undeveloped or used for active agriculture. As noted above, the environmental impacts associated with development of the Brawley campus, including a student enrollment up to 850 FTE, were evaluated at a program level of review in the previously certified 2003 SDSU Imperial Valley Campus Master Plan Project EIR (2003 EIR) (SCH 200251010). In CSU's effort to build out the IVC consistent with the previously approved Campus Master Plan, SDSU now proposes construction and operation of a sciences building, approximately 43,000 assignable square feet (sf) in size, that would be located on the Brawley campus.

The proposed project involves the construction and operation of a science, technology, engineering, and mathematics building that would house teaching labs, lecture spaces, faculty/administration offices, research spaces, and conference rooms, as well as mechanical, electrical, and telecom support spaces. The proposed project does not include/propose any increase in the previously authorized and approved maximum student enrollment of 850 FTE.

The proposed project site is approximately 3.2-acres in size and the construction staging areas would occupy approximately 1-acre of campus located southeast of the site and north of SR 78. The project includes 61,119 sf of on-site landscaping, including the construction of bio-retention areas to capture stormwater runoff from stormwater drainages systems that will be located throughout the project site. Hardscape improvements will include 41,297 sf of sidewalks and pedestrian walkways, which will connect the project site to existing campus buildings and parking lot.

Additionally, the project will require new points of connection to domestic water, fire water, and sewer lines from existing utility lines to serve the new building, as well as new domestic water line infrastructure. Potable water will be provided by the city of Brawley, as well as sewer and wastewater collection services. New utility infrastructure will also be required to support electrical services for the building, as well as a back-up diesel operated generator.

The proposed project building would have an area of 36,900 gross sf and would be approximately 35 feet in height. The project is projected to be built over the course of 19 months, with construction beginning in January 2024 and ending in approximately September 2025.Construction and equipment staging would require 1-acre of space within the campus, directly east of the existing building (Building 101) and parking lot. The project would involve site preparation, grading, and excavation associated with project construction. Excavation depths are anticipated to be 2 to 5 feet. Waste (i.e., excavated gravel/soil) generated during project construction would be balanced within the site.

3 Analysis Methodology

The analysis considers the potential environmental impacts of the proposed project relative to existing conditions. Establishment of the project site's existing cultural resource conditions has been prepared using information contained in the previously certified 2003 SDSU Imperial Valley Campus Master Plan Project EIR (SDSU 2003), with the information updated, as applicable, with recent California Historical Resources Information System (CHRIS) records search results, Native American Heritage Commission (NAHC) sacred lands file (SLF) search results, pedestrian survey results, archival research, and information provided by culturally affiliated Tribal groups.

4 Cultural Resources

4.1 Existing Conditions and Methods

4.1.1 Records Search

Dudek conducted a California Historical Resources Information Search (CHRIS) records search at the South Coastal Information Center (SCIC) for the project area and a 1-mile radius buffer around the project area on November 2, 2022. The records search revealed that 14 previous cultural resources studies have been completed within 1-mile of the project area; these 14 previous studies are listed in Table 1 below. Of the 14 studies, three of these previous studies intersect the current project area and are noted as such in Table 1. These three studies include one cultural resources inventory report, one historic property survey report, and one cultural resources identification study. Based on the previous studies, the entire project area has been studied and no cultural resources have been identified within the project area boundaries. The results of the records search are included in Confidential Attachment C.

Table 1. Previous Cultural Studies within 1-mile of the Project Area

Report Number	Year	Title	Author	Proximity
IM-00187	1979	CULTURAL RESOURCE INVENTORY OF AREAS AFFECTED BY REJECT STREAM REPLACEMENT PROJECTS	ECKHARDT, WILLIAM T.	Outside
IM-00189	1979	CULTURAL RESOURCE INVENTORY OF AREAS AFFECTED BY REJECT STREAM REPLACEMENT PROJECTS	ECKHARDT, WILLIAM	Outside
IM-00193	1979	ARCHAEOLOGICAL PHASE I SURVEY REPORT - PROPOSED CONSTRUCTION DETOUR OF ALAMO RIVER BRIDGE 58-118 EAST OF BRAWLEY	GOLDBERG, DONNA	Outside
IM-00476	1993	CULTURAL RESOURCE RECORDS SEARCH FOR SOUTHERN CALIFORNIA GAS COMPANY LINE 6902 SOUTH IMPERIAL COUNTY, CALIFORNIA	SINGER, CLAY A., JOHN ATWOOD, and SHELLEY MARIE GOMES	Outside
IM-00545	1979	ARCHAEOLOGICAL PHASE I SURVEY REPORT FOR THE PROPOSED CONSTRUCTION DETOUR OF ALAMO BRIDGE 58-118 EAST OF BRAWLEY	GOLDBERG, DONNA	Outside
IM-00659	1998	A CULTURAL RESOURCES INVENTORY OF THE M TRANSMISSION LINE POLE REPLACEMENT PROJECT, IMPERIAL	DOLAN, CHRISTY C. V.	Intersects

Table 1. Previous Cultural Studies within 1-mile of the Project Area

Report Number	Year	Title	Author	Proximity
		IRRIGATION DISTRICT, IMPERIAL COUNTY, CALIFORNIA		
IM-00671	1999	HISTORIC PROPERTY SURVEY FOR STATE ROUTE 78/111 BRAWLEY BIPASS	CRAFTS, KAREN C.	Outside
IM-00834	1998	NEGATIVE ARCHAEOLOGICAL SURVEY REPORT FOR THE CONSTRUCTION OF THE STATE ROUTE 78/111 BRAWLEY BYPASS	CRAFTS, KAREN C.	Outside
IM-00835	1998	HISTORIC ARCHITECTURAL SURVEY REPORT FOR THE BRAWLEY BY-PASS IMPERIAL COUNTY	FISHER, JIM	Outside
IM-00847	2003	NEGATIVE HISTORIC PROPERTY SURVEY REPORT FOR CONSTRUCTION OF IMPROVEMENTS TO SR-78 ASSOCIATED WITH EDUCATIONAL FACILITIES IN NORTHEASTERN IMPERIAL COUNTY	ROSEN, MARTIN	Intersects
IM-00848	2002	CULTURAL RESOURCE IDENTIFICATION STUDY FOR SAN DIEGO STATE UNIVERSITY IMPERIAL VALLEY CAMPUS, BRAWLEY, CALIFORNIA	ECKHARDT, WILLIAM T.	Intersects
IM-01230	2006	SHANK ROAD-ALAMO RIVER WETLANDS (AR21) PROJECT	BUREAU OF RECLAMATION	Outside
IM-01231	2005	ARCHAEOLOGICAL SURVEY AND MONITORING OF EIGHT BORE HOLE LOCATIONS AT THE SHANK ROAD PILOT WETLAND PROJECT LOCATED NEAR ALAMORIO IN THE VICINITY OF BRAWLEY, IMPERIAL COUNTY, CALIFORNIA	BUDINGER, FRED E.	Outside

Previously Recorded Resources

The SCIC records search revealed that no cultural resources have been recorded within the project area. The records search results did identify three cultural resources within 1-mile of the project area (Table 2). All three resources identified in the 1-mile search radius are historical and consist of a ranch complex and two isolates. The results of the records search and all Department of Parks and Recreation (DPR) forms are included in Confidential Attachment C.

Table 2. Previously Recorded Cultural Resources Within 1-Mile of the Project Area

Primary Number	Trinomial	Age	Description	Proximity
P-13-008011	-	Historic	Best Property/Johnson Ranch	Outside
P-13-008344	-	Historic	Isolate: glass fragment	Outside

P-13-008345	-	Historic	Isolate: earthenware plate	Outside

4.1.2 Archival Research

Dudek consulted historic maps and aerial photographs to understand the development of the project area. Historic aerial photographs of the project were available for 1953, 1984, 1985, 1996, 2002, 2005, 2009, 2010, 2012, 2014, 2016, 2018, and 2020 (NETR 2022). The 1953 historic photograph shows the project area as agricultural fields. In the 1984 aerial, the agricultural fields have been cleared. No substantial changes occur in the 1985 aerial. In the 1996 aerial, the vegetation has been cleared and no changes are observed in the 2002 aerial. In the 2005 aerial, the Brawley campus area has been cleared and buildings are in construction. The southern half of the Brawley Sciences building project area is graded, and the northern half consists of agricultural fields. The proposed staging area also consists of agricultural fields. By 2009, the campus is developed with a paved parking lot. The southern half of the Brawley Sciences building project area includes a shaded seating area and the northern half remains unchanged. In the 2010 aerial, the vegetation has been cleared. In the 2012 aerial, some clearing is observed to the east of the SDSU campus. In the 2014 aerial, two structures are observed to the west of the SDSU campus, and panels are observed in the eastern section of the project area. Additionally, the vegetation in the northern section of the project area has been cleared. No substantial changes are observed in the 2016 aerial. In the 2018 aerial, the two structures east of the SDSU campus have been removed, and 16 panels are observed. The vegetation has also been cleared throughout the project area and surrounding area. In the 2020 aerial, conditions look similar to present day conditions. This review of the historic aerial images demonstrates that the project Area has undergone substantial earth movement from the construction of the campus and agricultural activities. There are no historic-age structures present in the project area or staging area.

Historic topographic maps were also reviewed (earliest available is 1945). None of the topography maps show any structures located within the project area.

4.1.3 Review of Geomorphological Context

According to the U.S. Department of Agriculture Natural Resources Conservation Services (USDA 2023), one soil type is mapped in the project area, including Imperial silty clay, wet, located within the project area. The Imperial soil series generally occur in settings with basin floors at elevations ranging from -230 to 200 feet and are comprised of clayey alluvium derived from mixed and/or clayey lacustrine deposits (USDA 2023). Reoccurring alluvial action and flooding serve to support the development and presence of cultural deposits in the area. Since there are alluvial soils present throughout the project area, there is moderate potential for subsurface cultural resources.

4.1.4 NAHC and Tribal Correspondence

Native American Heritage Commission Sacred Lands File Search

Dudek requested a NAHC search of the SLF on December 14, 2022 for the project area. The SLF consists of a database of known Native American resources. These resources may not be included in the SCIC database. The NAHC replied on December 27, 2022, with results indicating the potential presence of relevant resources within the geographic area. The NAHC additionally provided a list of Native American Tribes and individuals/organizations with traditional geographic associations that might have knowledge of cultural resources in this area. Outreach letters were mailed on February 21, 2023, to all Native American group representatives included on the NAHC contact list. These letters sought to solicit additional information relating to Native American resources that may be impacted by the project. Native American representatives were requested to define a general area where known resources intersect the project area. Follow up emails were sent on March 7, 2023. Three responses have been received to date. The Quechan Indian Tribe responded on March 2, 2023, stating that they do not wish to comment on this project. The Jamul Indian Village responded on March 8, 2023, stating that they would like to defer to Tribes located closer to the project. The Viejas Band of Kumeyaay Indians responded on March 8, 2023, asking for the project description and ground disturbance Dudek provided the requested information to the Viejas Band of Kumeyaay Indians on March 10, 2023), and on March 10, 2023, the Viejas Band of Kumeyaay Indians responded that the project has cultural significance or ties to Viejas, that cultural resources have been located within or adjacent to the area of potential effect – direct effect (APE-DE) of the proposed project, and a request that a Kumeyaay Cultural Monitor be on site for ground disturbing activities, to be informed of any new developments, and would defer to Tribes closer to the project if they would like to conduct cultural monitoring. The San Pasqual Band of Mission Indians responded on April 18, 2023 to Dudek's information request letter, stating that the project is not within the boundaries of the San Pasqual Indian Reservation, however, it is within the boundaries of the territory that the tribe considers its Traditional Use Area (TUA), and that they would like to engage in government-to-government consultation under CEQA. The NAHC correspondence is included in Attachment D.

Assembly Bill (AB) 52 Consultation

The project is subject to compliance with AB 52 (California Public Resources Code [PRC], Section 21074), which requires consideration of impacts to tribal cultural resources as part of the CEQA process, and that the lead agency notify California Native American Tribal representatives (that have requested notification) who are traditionally or culturally affiliated with the geographic area of the proposed project. Although no tribes previously requested such notice, CSU/SDSU, as lead agency, sent letters on March 14, 2023 to all tribes included on the previously referenced NAHC list. The letters contained the following information: a project description and location description; a request for input relative to tribal cultural resources in the area; an outline of timing relative to the AB 52 process; an opportunity for consultation; and, contact information for the appropriate lead agency representative. A copy of a representative AB 52 letter is included in Attachment E.

To date, one response to the letters was received. The Sycuan Band of the Kumeyaay Nation responded on April 4, 2023 and determined that the project is not within the boundaries of the recognized Sycuan Indian Reservation, however, it is within the boundaries of the Kumeyaay Nation's traditional territory. The Sycuan Band of the Kumeyaay Indians' letter stated it would like to consult on the project and would like the records for sacred land sites within a one-mile buffer, any known archaeological site records within a one-mile buffer, and cultural and environmental studies/report of the project area. Sycuan also recommended to contact other Kumeyaay Tribes such as Viejas, Barona, Campo, Manzanita, La Posta, and Jamul; each of these Tribes was included in the AB 52 notification mailing.

Thus, in response to the initial outreach letter and the separate AB 52 letter, two tribes requested AB 52 consultation: the San Pasqual Band of Mission Indians and the Sycuan Band of the Kumeyaay Indians.

On July 31, 2023, a meeting was held between representatives of the San Pasqual Band of Mission Indians and CSU/SDSU. During the meeting, SDSU representatives provided an overview of the proposed project and explained the findings of the cultural resources technical memo prepared by Dudek; relevant excerpts of the technical memo also were provided to San Pasqual Band in advance of the meeting. In response, the San Pasqual Band asked if the site was monitored by tribes when the existing building was first constructed, and SDSU responded that there was no record of any such monitoring. The San Pasqual Band requested an opportunity to monitor construction activities during project-related ground-disturbing activities associated with the current project and SDSU explained that the request could be accommodated based on a rotating schedule with other tribes that also requested to monitor the project.

On August 4, 2023, a meeting between representatives of the Sycuan Band of the Kumeyaay Indians and CSU/SDSU was held. As with the San Pasqual meeting, SDSU representatives provided an overview of the proposed project and explained the findings of the cultural resources technical memo prepared by Dudek; relevant excerpts of the technical memo also were provided to the Sycuan Band in advance of the meeting. In response, the Sycuan Band asked if artifacts were found on site during past projects and SDSU replied not to its knowledge. The Sycuan Band requested a site visit, along with an opportunity to conduct tribal monitoring during project-related ground-disturbing activities. SDSU responded that the site visit would be arranged and tribal monitoring could be accommodated based on a rotating schedule with other tribes that also requested to monitor project construction.

Meeting minutes of both tribal consultation meetings are included in Appendix F.

4.1.5 Intensive Pedestrian Survey

Dudek archaeologist Keshia Montifolca, M.A., RPA, conducted an intensive-level pedestrian survey of the project area on February 22, 2023. All survey work was conducted employing standard archaeological procedures and techniques consistent with the Secretary of the Interior Standards. The ground surface was examined for prehistoric artifacts (e.g., flaked stone tools, tool-making debris, stone milling tools, ceramics, fire-affected rock), soil discoloration that might indicate the presence of a cultural midden, soil depressions, features indicative of the current or former presence of structures or buildings (e.g., standing exterior walls, post holes, foundations), and historic artifacts (e.g., metal, glass, ceramics, building materials). Ground disturbances such as burrows, cut banks, and drainages were also visually inspected for exposed subsurface materials.

The project area is flat and has been previously disturbed from the construction of the existing campus structures, parking lot, shaded seating area, earthen irrigation ditches, access dirt roads, storage area, and active agricultural field. Little to no vegetation was observed within the southern section of the project area and staging area and ground visibility was excellent (100%). The northern section of the project area consists of an active agricultural field and ground visibility was fair at (60-70%). Within the project area, a chain-linked fence separates the southern portion from the active agricultural field. A shaded seating area with gravel shows evidence of disturbance from vehicle tire tracks (Attachment B: Photo 1). North of the chain-linked fence is a graded dirt access road (Attachment B: Photo 2), with an earthen irrigation ditch and culvert pipe to the north of the road (Attachment B: Photo 3). North of the ditch is another dirt access road, and plastic pipes are observed within the cut of the access road and the agricultural field (Attachment B: Photo 4). The northern half of the project area consists of an active agricultural field (Attachment B: Photo 5).

The proposed staging area is located southeast of the proposed project area. The area is flat, mostly unvegetated, and shows evidence of disturbance from vehicle tire tracks and a chain-linked fence surrounds the perimeter of the area (Attachment B: Photo 6). Pieces of modern glass, irrigation pipes, and guywire are observed throughout the staging area (Attachment B: Photo 7). More evidence of disturbance can be observed throughout the staging area in the form of bioturbation, erosion, and buried irrigation pipes (Attachment B: Photo 8). No artifacts or features were identified during this survey.

4.1.6 Summary of Research and Conclusion

The current cultural resources inventory was completed to satisfy the requirements of CEQA. *Dudek's cultural resources inventory of the project indicates that there is low sensitivity for identifying intact subsurface cultural resource deposits during project implementation.* A records search from the SCIC did not identify any cultural resources within the project area. Additionally, an intensive pedestrian survey did not identify any cultural resources within the project area. The project area has been disturbed from the shaded seating area, adjacent parking lot and existing campus structures, graded access roads, irrigation ditches, and active agricultural field. No cultural resources are present within the project area. The review of aerial photographs reveals that a majority of the project area has been heavily disturbed by construction of the existing campus structures and agricultural activities. Any intact subsurface archaeological deposits that were present would have been disturbed by years of continuous agricultural activities and would no longer remain intact.

Specific to Native American resources, the Viejas Band of Kumeyaay Indians stated that cultural resources have been located within or adjacent to the APE-DE of the proposed project, though the exact locations were not specified. As such, Viejas requests that a Kumeyaay Cultural Monitor be on site for ground disturbing activities. *Dudek's assessment, however, found no evidence of cultural resources within the project area and determines that no historical resources, as defined under CEQA, would be impacted by the project.* This includes no direct, indirect, or cumulative impacts. *In consideration of the negative results of the intensive-level survey and archival research, Dudek recommends no further archaeological efforts or mitigation, including cultural construction monitoring, to be necessary in support of implementation of the project.*

In compliance with AB 52, SDSU, as lead agency, is responsible for conducting government to government consultation with pertinent tribal entities relative to tribal cultural resources. To date, as discussed above, one request for consultation was received in response to SDSU's initial outreach letter and a second consultation request was received in response to SDSU's AB 52 notification letters. The two tribes requesting AB 52 consultation were: the San Pasqual Band of Mission Indians and the Sycuan Band of the Kumeyaay Indians.

As previously described, a consultation meeting with the San Pasqual Band of Mission Indians was held on July 31, 2023, and a consultation meeting with the Sycuan Band of the Kumeyaay Indians was held on August 4, 2023. Neither tribe identified the location of any tribal cultural resources within the project area during the meetings. However, in response to a request by each tribe, SDSU will accommodate cultural resources monitoring during project-related ground-disturbing activities.

4.2 Regulatory Framework

The California Register of Historic Resources (Public Resources Code section 5020 et seq.)

Under CEQA, the term "historical resource" includes but is not limited to "any object, building, structure, site, area, place, record, or manuscript which is historically or archaeologically significant, or is significant in the architectural, engineering, scientific, economic, agricultural, educational, social, political, military, or cultural annals of California" (California Public Resources Code section 5020.1(j)). In 1992, the California legislature established the California Register of Historic Resources (CRHR) "to be used by state and local agencies, private groups, and citizens to identify the state's historical resources and to indicate what properties are to be protected, to the extent prudent and feasible, from substantial adverse change" (California Public Resources Code section 5024.1(a)). A resource is eligible for listing in the CRHR if the State Historical Resources Commission determines that it is a significant resource and that it meets any of the following National Register of Historic Places (NRHP) criteria:

- Associated with events that have made a significant contribution to the broad patterns of California's history and cultural heritage.
- Associated with the lives of persons important in our past.
- Embodies the distinctive characteristics of a type, period, region, or method of construction, or represents the work of an important creative individual, or possesses high artistic values.
- Has yielded, or may be likely to yield, information important in prehistory or history.

(California Public Resources Code section 5024.1(c).) Resources less than 50 years old are not considered for listing in the CRHR but may be considered if it can be demonstrated that sufficient time has passed to understand the historical importance of the resource (see 14 CCR, section 4852(d)(2)).

The CRHR protects cultural resources by requiring evaluations of the significance of prehistoric and historic resources. The criteria for the CRHR are nearly identical to those for the NRHP, and properties listed or formally designated as eligible for listing on the NRHP are automatically listed on the CRHR, as are the state landmarks and points of interest. The CRHR also includes properties designated under local ordinances or identified through local historical resource surveys. The State Historic Preservation Officer maintains the CRHR.

Native American Historic Cultural Sites (California Public Resources Code section 5097 et seq.)

State law addresses the disposition of Native American burials in archaeological sites and protects such remains from disturbance, vandalism, or inadvertent destruction; establishes procedures to be implemented if Native American skeletal remains are discovered during construction of a project; and establishes the NAHC to resolve disputes regarding the disposition of such remains. In addition, the Native American Historic Resource Protection Act makes it a misdemeanor punishable by up to 1 year in jail to deface or destroy an Indian historic or cultural site that is listed or may be eligible for listing in the CRHR.

California Native American Graves Protection and Repatriation Act

The California Native American Graves Protection and Repatriation Act (California Repatriation Act), enacted in 2001, required all state agencies and museums that receive state funding and that have possession or control over collections of human remains or cultural items, as defined, to complete an inventory and summary of these remains and items on or before January 1, 2003, with certain exceptions. The California Repatriation Act also provides a process for the identification and repatriation of these items to the appropriate tribes.

California Environmental Quality Act

As described further below, the following CEQA statutes and CEQA Guidelines are of relevance to the analysis of archaeological and historic resources:

1. California Public Resources Code section 21083.2(g): Defines “unique archaeological resource.”
2. California Public Resources Code section 21084.1 and CEQA Guidelines section 15064.5(a): Define historical resources. In addition, CEQA Guidelines section 15064.5(b) defines the phrase “substantial adverse change in the significance of an historical resource;” it also defines the circumstances when a project would materially impair the significance of a historical resource.
3. California Public Resources Code section 5097.98 and CEQA Guidelines section 15064.5(e): Set forth standards and steps to be employed following the accidental discovery of human remains in any location other than a dedicated ceremony.
4. California Public Resources Code sections 21083.2(b)-(c) and CEQA Guidelines section 15126.4: Provide information regarding the mitigation framework for archaeological and historic resources, including options of preservation-in-place mitigation measures; preservation-in-place is the preferred manner of mitigating impacts to significant archaeological sites because it maintains the relationship between artifacts and the archaeological context, and may also help avoid conflict with religious or cultural values of groups associated with the archaeological site(s).

Under CEQA, a project may have a significant effect on the environment if it may cause “a substantial adverse change in the significance of an historical resource” (California Public Resources Code section 21084.1; CEQA Guidelines section 15064.5(b)). If a site is either listed or eligible for listing in the CRHR, or if it is included in a local register of historic resources, or identified as significant in a historical resources survey (meeting the requirements of California Public Resources Code section 5024.1(q)), it is a “historical resource” and is presumed to be historically or culturally significant for purposes of CEQA (California Public Resources Code section 21084.1; CEQA Guidelines section 15064.5(a)). The lead agency is not precluded from determining that a resource is a historical resource even if it does not fall within this presumption (California Public Resources Code section 21084.1; CEQA Guidelines section 15064.5(a)).

A “substantial adverse change in the significance of an historical resource” reflecting a significant effect under CEQA means “physical demolition, destruction, relocation, or alteration of the resource or its immediate surroundings such that the significance of an historical resource would be materially impaired” (CEQA Guidelines section 15064.5(b)(1); California Public Resources Code section 5020.1(q)). In turn, the significance of a historical resource is materially impaired when a project:

1. Demolishes or materially alters in an adverse manner those physical characteristics of an historical resource that convey its historical significance and that justify its inclusion in, or eligibility for, inclusion in the California Register; or
2. Demolishes or materially alters in an adverse manner those physical characteristics that account for its inclusion in a local register of historical resources pursuant to section 5020.1(k) of the Public Resources Code or its identification in an historical resources survey meeting the requirements of section 5024.1(g) of the Public Resources Code, unless the public agency reviewing the effects of the project establishes by a preponderance of evidence that the resource is not historically or culturally significant; or

3. Demolishes or materially alters in an adverse manner those physical characteristics of a historical resource that convey its historical significance and that justify its eligibility for inclusion in the California Register as determined by a lead agency for purposes of CEQA.

See Section 7.1, below for a discussion of the CEQA guidelines for determining significance and mitigating impacts to unique archaeological resources.

Assembly Bill 52

California AB 52, which took effect July 1, 2015, establishes a consultation process between California Native American Tribes and lead agencies, to be conducted as part of the CEQA process, to address tribal concerns regarding project impacts and mitigation to "tribal cultural resources" (TCR). Public Resources Code section 21074(a) defines TCRs and states that a project that has the potential to cause a substantial adverse change to a TCR is a project that may have an adverse effect on the environment. A TCR is defined as a site, feature, place, cultural landscape, sacred place, and object with cultural value to a California Native American tribe that is either:

1. listed or eligible for listing in the CRHR or a local register of historical resources, or
2. determined by a lead agency to be a TCR.

Health and Safety Code Section 7050.5 and Public Resources Code Section 5097.98

CEQA Guidelines Section 15064.5 assigns special importance to human remains and specifies procedures to be used when Native American remains are discovered. As described below, these procedures are detailed in California Health and Safety Code Section 7050.5 and Public Resources Code Section 5097.98.

California law protects Native American burials, skeletal remains, and associated grave goods, regardless of their antiquity, and provides for the sensitive treatment and disposition of those remains. Health and Safety Code Section 7050.5 requires that if human remains are discovered in any place other than a dedicated cemetery, no further disturbance or excavation of the site or nearby area reasonably suspected to contain human remains shall occur until the County coroner has examined the remains (California Health and Safety Code Section 7050.5[b]). If the coroner determines or has reason to believe the remains are those of a Native American, the coroner must contact the NAHC within 24 hours (California Health and Safety Code Section 7050.5[c]). In accordance with California Public Resources Code Section 5097.98(a), the NAHC will notify the Most Likely Descendant (MLD). With the permission of the landowner, the MLD may inspect the site of discovery. Within 48 hours of being granted access to the site, the MLD may recommend means of treatment or disposition, with appropriate dignity, of the human remains and associated grave goods.

5 Impact Analysis and Conclusions for Cultural Resources

5.1 Thresholds of Significance

The significance criteria used to evaluate the project impacts to cultural resources are based on Appendix G of the CEQA Guidelines (Cal. Code Regs., Title 14, Chptr. 3, sections 15000-15387.). A significant impact under CEQA would occur if the project would:

a) Cause a substantial adverse change in the significance of a historical resource pursuant to §15064.5?
b) Cause a substantial adverse change in the significance of an archaeological resource pursuant to §15064.5?
c) Disturb any human remains, including those interred outside of dedicated cemeteries?

5.2 Impact Analysis

a) Would the project cause a substantial adverse change in the significance of a historical resource pursuant to §15064.5?

Impacts to historical resources pursuant to §15064.5 were evaluated in the IS prepared for the 2003 Campus Master Plan EIR, which concluded that no significant impacts to historical resources would occur.

Dudek's cultural resources inventory of the project indicates that there is low sensitivity for identifying intact subsurface historical resource deposits during project implementation. A records search from the SCIC did not identify any historical resources within the project area. Additionally, an intensive pedestrian survey did not identify any historical resources within the project area. The project area has been disturbed from the shaded seating area, adjacent parking lot and existing campus structures, graded access roads, irrigation ditches, and active agricultural field. No historical resources pursuant to §15064.5 were identified within the project area. Aerial photographs show that the project area has been disturbed by active agricultural fields since 1953, and structures only appeared within the project area in 2009. There are no historic-era (greater than 45 years old) structures within the project area. Therefore, the project would not result in a substantial adverse change in the significance of a historical resource pursuant to §15064.5 and potential impacts to historic resources as a result of project implementation would be **less than significant.**

b) Would the project cause a substantial adverse change in the significance of an archaeological resource pursuant to §15064.5?

Impacts to archaeological resources pursuant to §15064.5 were evaluated in Section 3.5 Cultural Resources of the Campus Master Plan 2003 EIR. A mitigation measure was adopted that outlines response protocol and requirements in the event that potential resources are discovered during excavation and/or construction associated with buildout of the campus (See MMRP page 11-2 through 11-3)[1]. With implementation of the mitigation measure, impacts were determined to be less than significant.

---

1 **3.5 Cultural Resources Mitigation Measure** included on Page 11-2 through 11-3 of the 2003 EIR: (1) It is recommended that if an initial finding within the project area where no known resources have been recorded is made, appropriate contact with the local Native American group per the Native American Heritage Commission will ensue, in accordance with the SDSU construction contract conditions, which state that: "If the Contractor discovers any artifacts during excavation and/or construction, the Contractor shall stop all affected work and notify the Trustees, who -will call in a qualified archaeologist designated by the California Archaeological Inventory to assess the discovery and suggest further mitigation, as necessary. If the Contractor discovers human remains, the Contractor shall notify the Trustees, who will be responsible for contacting the county corner and a qualified archaeologist. If the remains are determined to be Native American, the Trustees shall contact the appropriate tribal representatives to oversee removal of the remains." If any buried cultural deposits are discovered during construction, development should be suspended and the discovery protected and evaluated for its potential eligibility for listing on the National Register of Historic Places or the California Register of Historical Resources.

Dudek's cultural resources inventory of the project indicates that there is low sensitivity for identifying intact subsurface archaeological resource deposits during project implementation. A records search from the SCIC did not identify any archaeological resources within the project area. Additionally, an intensive pedestrian survey did not identify any archaeological resources within the project area. The project area has been disturbed from the shaded seating area, adjacent parking lot and existing campus structures, graded access roads, irrigation ditches, and active agricultural field. No archaeological resources pursuant to §15064.5 were identified within the project area. The review of aerial photographs reveals that a majority of the project area has been heavily disturbed by construction of the existing campus structures and agricultural activities. Any intact archaeological subsurface deposits that were present would have been disturbed by years of continuous agricultural activities and would no longer remain intact.

However, because the project includes ground disturbance associated with construction of the new building, the potential to encounter and/or destroy previously undiscovered archaeological materials or features during earth-moving activities exists. Any substantial adverse change in the significance of an archaeological resource pursuant to §15064.5 would be a potentially significant impact. The Cultural Resources mitigation measure included in the 2003 EIR MMRP and previously adopted by the CSU, in addition to mitigation measure CUL-1, presented below, would reduce potentially significant impacts to a **less-than-significant** level by requiring construction to halt in the event of an archaeological discovery during construction activities, and evaluation of the find by a qualified archaeologist.

CUL-1: If CSU/SDSU, or its designee, discovers, through the building contractor, any artifacts during excavation and/or construction of the Brawley Sciences building, CSU/SDSU shall direct the contractor to stop all affected work and call in a qualified archaeologist meeting the Secretary of the Interior's Professional Qualification Standards to assess the discovery and, if necessary, suggest further mitigation. If CSU/SDSU, or its designee, discovers, through the Contractor, human remains during construction of the Brawley Sciences building, CSU/SDSU, or its designee, shall contact the county corner and a qualified archaeologist. If the remains are determined to be Native American, CSU/SDSU shall contact the appropriate tribal representatives to oversee removal of the remains. If any buried cultural deposits are discovered during construction, development should be suspended or directed to another location and the discovery protected and evaluated for its potential eligibility for listing on the National Register of Historic Places (NRHP) or the California Register of Historic Resources (CRHR). Construction activities may continue in other areas, but should be redirected a safe distance from the find. If the new discovery is evaluated and found to be significant under CEQA or eligible for listing on the NRHP or the CRHR and avoidance is not feasible, additional work such as data recovery may be warranted. Following evaluation by a qualified archaeologist and in consultation with CSU/SDSU, construction shall be permitted to resume.

c) Would the project disturb any human remains, including those interred outside of dedicated cemeteries?

The IS prepared for the 2003 EIR determined that no impacts to human remains would occur within the campus boundaries. However, as previously noted, 3.5 Cultural Resources Mitigation Measure was adopted, which notes that SDSU construction contracts address the discovery of human remains and require notification of the County Coroner and a qualified archaeologist in the event of such discovery, and if the remains are determined to be Native American, require contact of the appropriate tribal representatives to oversee removal of the remains.

The project area is not used as a cemetery and is not otherwise known to contain human remains. The pedestrian field survey conducted for the project did not identify any human remains or find any indications that they would be expected to be found at the project area. However, although unlikely, there is the possibility of human remains being discovered during project-related ground disturbing activities. If remains are discovered during project construction activities, SDSU and its construction contractor, consistent with the previously adopted mitigation measure, would comply with procedures set forth in the California Public Resources Code (Section 5097.98) and State Health and Safety Code (Section 7050.5).

In accordance with Section 7050.5 of the California Health and Safety Code, if human remains are found, the County Coroner shall be immediately notified of the discovery. No further excavation or disturbance of the site or any nearby area reasonably suspected to overlie adjacent remains shall occur until the appropriate treatment and disposition of the human remains. If the County Coroner determines that the remains are, or are believed to be, Native American, he or she shall notify the NAHC in Sacramento within 24 hours. In accordance with California Public Resources Code Section 5097.98, the NAHC must immediately notify the person or persons it believes to be the most likely descendant (MLD) from the deceased Native American. The MLD shall complete inspection within 48 hours of being granted access to the site and make recommendations for the treatment and disposition, in consultation with the property owner, of the human remains.

Compliance with California Health and Safety Code Section 7050.5 and California Public Resources Code Section 5097, in combination with the previously adopted mitigation measure, would ensure avoidance or minimized disturbance of potentially encountered human remains as well as appropriate treatment of any remains that are discovered. Impacts would be **less than significant.**

6 Impact Analysis and Conclusions for Tribal Cultural Resources

6.1 Thresholds of Significance

The significance criteria used to evaluate the project impacts to tribal cultural resources are based on Appendix G of the CEQA Guidelines. According to Appendix G of the CEQA Guidelines, a significant impact under CEQA would occur if the project would:

1. Cause a substantial adverse change in the significance of a tribal cultural resource, defined in Public Resources Code section 21074 as either a site, feature, place, cultural landscape that is geographically defined in terms of the size and scope of the landscape, sacred place, or object with cultural value to a California Native American tribe, and that is:
   a. Listed or eligible for listing in the California Register of Historical Resources, or in the local register of historical resources as defined in Public Resources Code section 5020.1(k); or
   b. A resource determined by the lead agency, in its discretion and supported by substantial evidence, to be significant pursuant to criteria set forth in subdivision (c) of Public Resources Code Section 5024.1. In applying the criteria set forth in subdivision (c) of Public Resource Code Section 5024.1, the lead agency shall consider the significance of the resource to a California Native American tribe.

6.2 Impact Analysis

a) ***Would the Project cause a substantial adverse change in the significance of a tribal cultural resource, as defined in PRC Section 21074, as either a site, feature, place, or cultural landscape that is geographically defined in terms of the size and scope of the landscape, sacred place, or object with cultural value to a California Native American tribe, and that is a resource listed or eligible for listing in the California Register of Historical Resources, or in a local register of historical resources as defined in PRC, Section 5020.1(k)?***

and

Would the Project cause a substantial adverse change in the significance of a tribal cultural resource as defined in PRC Section 21074, as either a site, feature, place, or cultural landscape that is geographically defined in terms of the size and scope of the landscape, sacred place, or object with cultural value to a California Native American tribe, and that is a resource determined by the lead agency, in its discretion and supported by substantial evidence, to be significant pursuant to criteria set forth in PRC, Section 5024.1(c)? In applying the criteria set forth in PRC, Section 5024.1(c), the lead agency shall consider the significance of the resource to a California Native American tribe.

The IS prepared for the 2003 EIR did not analyze impacts to TCRs as AB 52 went into effect on July 1, 2015 and, therefore, was not in effect at the time of EIR preparation.

Dudek's cultural resources inventory of the project site included a records search from the SCIC, archival research, NAHC outreach, and a pedestrian survey. The SCIC records search did not identify any cultural resources within the project area and the pedestrian survey did not identify any cultural resources within the project area.

A search of the NAHC SLF was conducted and the NAHC replied on December 27, 2022, with results indicating the potential presence of relevant resources within the geographic area. The NAHC additionally provided a list of Native American Tribes and individuals/organizations with traditional geographic associations that might have knowledge of cultural resources in this area. Outreach letters were mailed on February 21, 2023, to all Native American group representatives included on the NAHC contact list. These letters sought to solicit additional information relating to Native American resources that may be impacted by construction and development of the project. Three responses have been received to date and no TCRs have been identified within the project area.

In compliance with AB 52, CSU/SDSU, as lead agency, is responsible for conducting government to government consultation with pertinent tribal entities. In accordance with the law's requirements, SDSU mailed AB 52 notification letters to all tribes NAHC recommended tribes on March 14, 2023. In response, one letter was received from the Sycuan Band of the Kumeyaay Nation. The Sycuan Band requested: to consult on the project; the records for sacred land sites within a one-mile buffer; any known archaeological site records within a one-mile buffer; and, the cultural and environmental studies/report prepared for the project area. The Sycuan Band also recommended SDSU contact other Kumeyaay Tribes such as Viejas, Barona, Campo, Manzanita, La Posta, and Jamul; each of these Tribes was included in the AB 52 notification mailing.

In addition to the AB 52 letters, SDSU also sent out an initial mailing to all NAHC recommended tribes describing the proposed project and seeking any input relative to tribal cultural resources. In response to that mailing, the San Pasqual Band of Mission Indians requested consultation on the project.

In response to the two consultation requests, a meeting between representatives of CSU/SDSU and the San Pasqual Band of Mission Indians was held on July 31, 2023 and a meeting with the Sycuan Band of the Kumeyaay Indians was held on August 4, 2023. During the AB 52 consultation meetings with both tribes, no tribal cultural resources were identified by either tribe within the project area. However, at the request of both tribes, SDSU will provide for rotating cultural resources monitoring by a representative of the two tribes during project construction activities.

Mitigation measure CUL-2, presented below, would reduce potentially significant impacts to a **less-than-significant** level by requiring cultural resources monitoring during construction.

CUL-2: Although the potential for discovery of tribal cultural resources on the project site is considered low, in response to requests made during AB 52 consultation meetings, CSU/SDSU shall authorize tribal monitoring of such resources during project construction grading activities and shall provide appropriate remuneration for such monitoring consistent with standard practices. SDSU retains the authority to select the monitor, which shall be provided by either the Sycuan Band of the Kumeyaay Nation or the San Pasqual Band of Mission Indians. Such monitoring by a single tribal monitor shall be authorized on a daily basis during project construction grading activities; however, in the event a monitor is not available on any given day, project construction activities may continue uninterrupted. In the event tribal cultural resources are inadvertently encountered during project construction activities, work in the immediate area must stop and a qualified archaeologist meeting the Secretary of the Interior's Professional Standards shall assess the discovery in consultation with the Sycuan Band of the Kumeyaay Nation and the San Pasqual Band of Mission Indians to evaluate the resource and develop a plan for treatment and disposition of the resource. If avoidance is not feasible, additional work such as data recovery may be warranted. Following evaluation by a qualified archaeologist, in consultation with the Sycuan Band of the Kumeyaay Nation, the San Pasqual Band of Mission Indians, and CSU/SDSU, construction shall be permitted to resume.

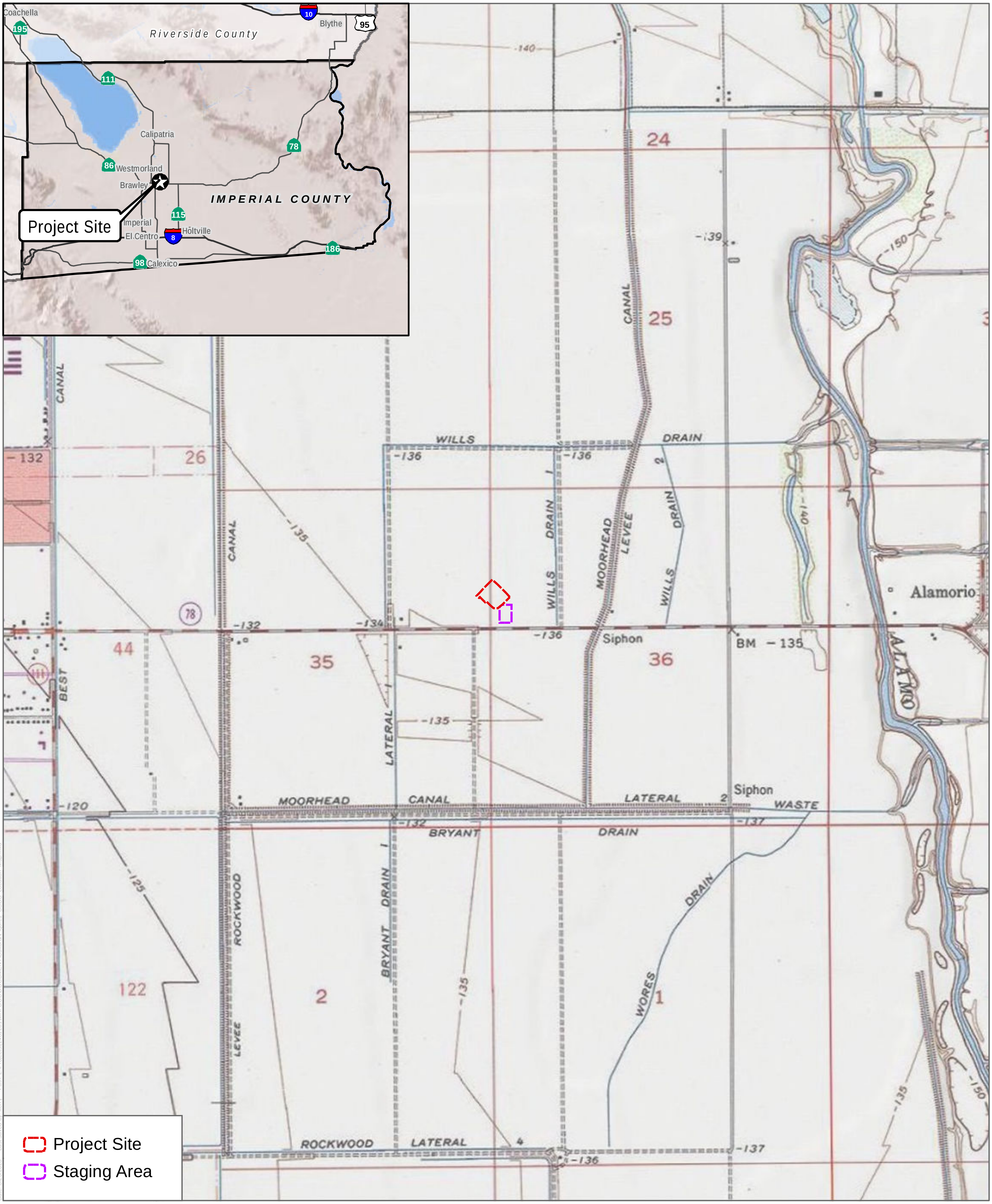
7 References

NETR (National Environmental Title Research). 2023. Address search SDSU Brawley Campus, California. Accessed February 23, 2022 http://www.historicaerials.com/

SDSU (San Diego State University). 2003. SDSU Imperial Valley Campus Master Plan Project (SCH No. 200251010).

USDA (U.S. Department of Agriculture). 2023. Web Soil Survey. USDA, Natural Resources Conservation Service, Soil Survey Staff. Accessed February 28, 2023. http://websoilsurvey.nrcs.usda.gov

Attachment A
Figures



SOURCE: USGS 7.5-Minute Series Alamorio, Quadrangles
Township 13S; Range 14E; Sections 35, 36

DUDEK

0 1,000 2,000 Feet
0 285 570 Meters
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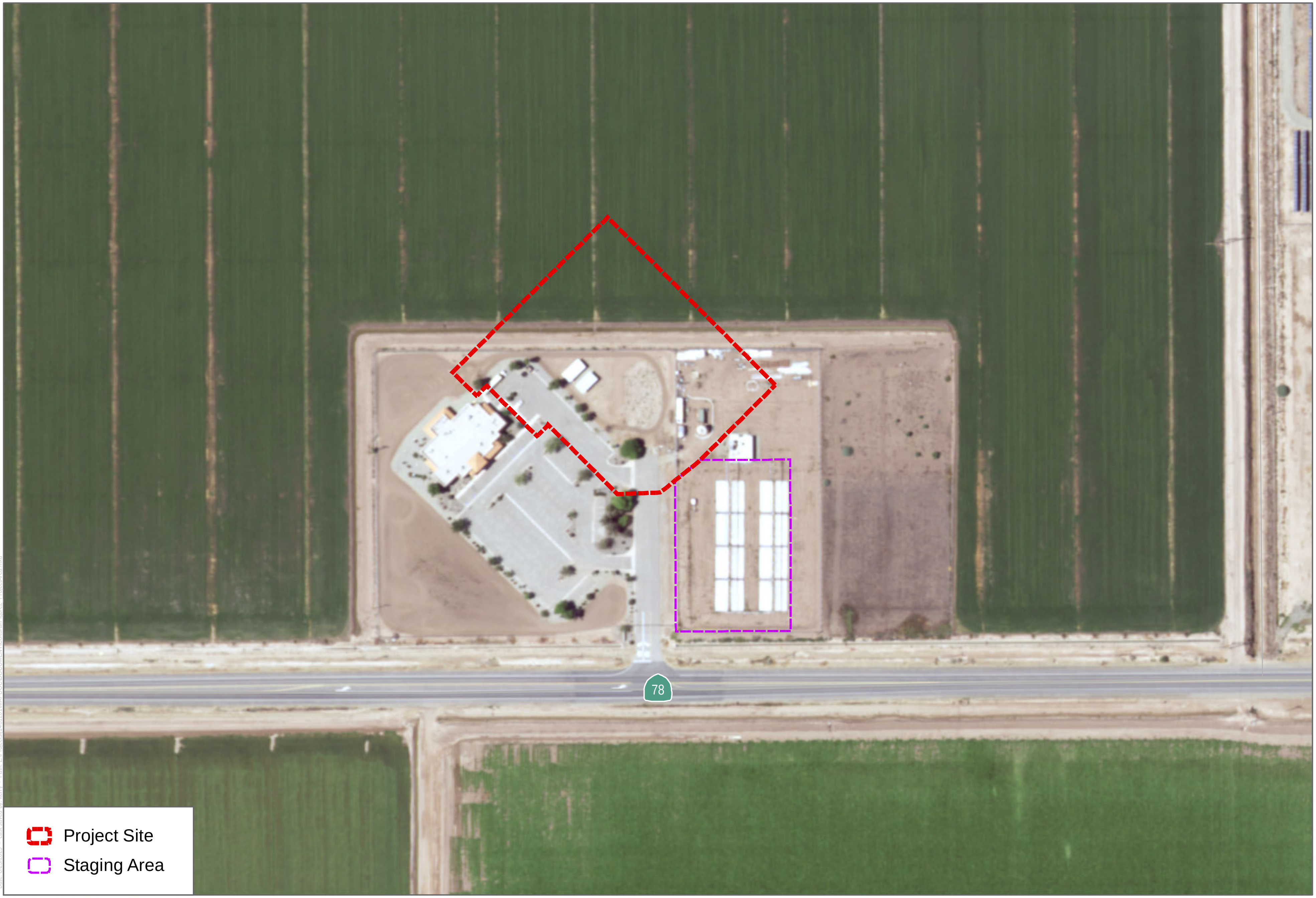
FIGURE 1
Project Location
SDSU Brawley Sciences Building Project



SOURCE: NAIP 2020

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Feet

FIGURE 2
Project Area
SDSU Brawley Sciences Building Project

Attachment B
Site Photos

Photo 1: View of shaded seating area, in the southern half of the Project area, view facing west.

Photo 2: View of dirt access road in central portion of the Project area, view facing west.

Photo 3: View of earthen irrigation ditch and adjacent dirt roads in the central portion of the Project area, view facing west.

Photo 4: View of dirt road and agricultural field in the central portion of the Project area, view facing northwest.

Photo 5: View of mowed agriculture field in the northern section of the Project area, view facing north.

Photo 6: View of the proposed staging area located in the western section, view facing south.

Photo 7: View of the proposed staging area located in the central section, view facing southeast.

Photo 8: View of the proposed staging area located in the central section, view facing south.

Confidential Attachment C

SCIC Records Search Results

Attachment D
NAHC Sacred Lands Search Results

From: Keshia Montifolca
Sent: Wednesday, December 14, 2022 2:47 PM
To: nahc@nahc.ca.gov
Subject: Sacred Lands Search -SDSU Brawley Lithium Research Hub/STEM Facility Project (14812)
Attachments: Sacred Lands File Contact Form - SDSU Brawley.pdf

Hi,

Please see attached for a Sacred Lands File Search request for the SDSU Brawley Lithium Research
Hub/STEM Facility Project (14812). Let me know if you have any questions or need additional
information.

Thank you!

Keshia Montifolca, M.A., RPA
Archaeologist

605 Third Street, Encinitas, CA 92024
O: 619.949.3082 C: 619.372.6255
www.dudek.com

Sacred Lands File & Native American Contacts List Request

NATIVE AMERICAN HERITAGE COMMISSION
1550 Harbor Blvd, Suite 100
West Sacramento, CA 95501
(916) 373-3710
(916) 373-5471 – Fax
nahc@nahc.ca.gov

Information Below is Required for a Sacred Lands File Search

Project: SDSU Brawley Lithium Research Hub/STEM Facility Project (PN 14812)

County: Imperial

USGS Quadrangle
Name: Alamorio

Township: 13S Range: 14E Section(s): 25, 26, 35, 36

Company/Firm/Agency:
Dudek

Contact Person: Keshia Montifolca

Street Address: 605 Third Street

City: Encinitas, CA Zip: 92024

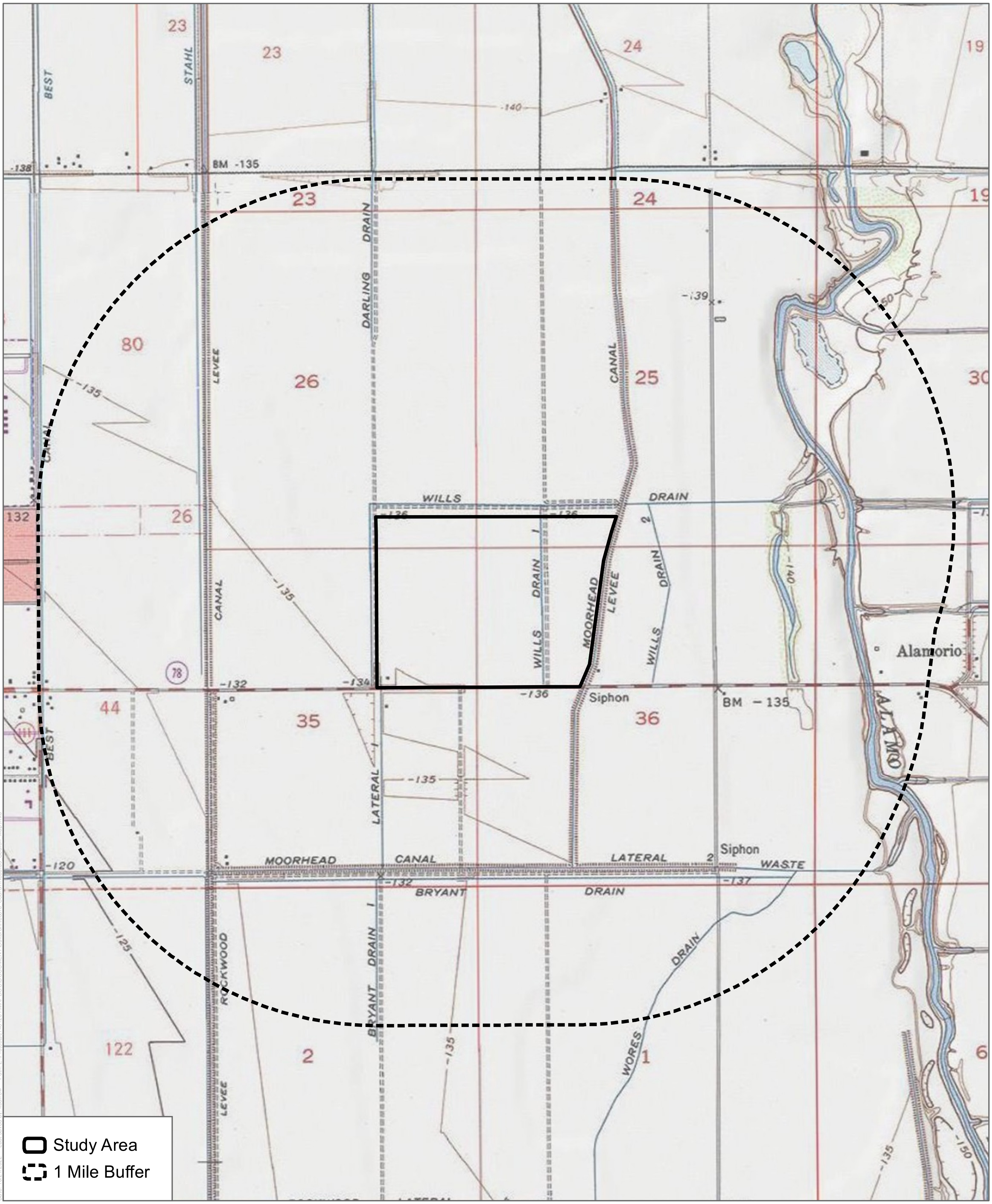
Phone: (619) 949-3082 Extension:

Fax:

Email: kmontifolca@dudek.com

Project Description:
The proposed project would involve the construction of the Imperial Valley Campus Brawley Building, a 43,000 assignable square foot Lithium Research Hub/STEM research and instruction facility on the San Diego State University Brawley campus.

☑ Project Location Map is attached



SOURCE: USGS 7.5-Minute Series Alamorio, Quadrangles
Township 13S; Range 14E; Sections 25, 26, 35, 36

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1:24,000

Records Search

SDSU Brawley STEM Facility

NATIVE AMERICAN HERITAGE COMMISSION

NAHC HEADQUARTERS
1550 Harbor Boulevard
Suite 100
West Sacramento,
California 95691
(916) 373-3710
nahc@nahc.ca.gov
NAHC.ca.gov

December 27, 2022

Keshia Montifolca
Dudek

Via Email to: kmontifolca@dudek.com

Re: SDSU Brawley Lithium Research Hub/STEM Facility Project, Imperial County

Dear Ms. Montifolca:

A record search of the Native American Heritage Commission (NAHC) Sacred Lands File (SLF) was completed for the information you have submitted for the above referenced project. The results were positive. Please contact the tribes on the attached list for more information. Other sources of cultural resources should also be contacted for information regarding known and recorded sites.

Attached is a list of Native American tribes who may also have knowledge of cultural resources in the project area. This list should provide a starting place in locating areas of potential adverse impact within the proposed project area. I suggest you contact all of those indicated; if they cannot supply information, they might recommend others with specific knowledge. By contacting all those listed, your organization will be better able to respond to claims of failure to consult with the appropriate tribe. If a response has not been received within two weeks of notification, the Commission requests that you follow-up with a telephone call or email to ensure that the project information has been received.

If you receive notification of change of addresses and phone numbers from tribes, please notify me. With your assistance, we can assure that our lists contain current information.

If you have any questions or need additional information, please contact me at my email address: Pricilla.Torres-Fuentes@nahc.ca.gov.

Sincerely,

Pricilla Torres-Fuentes

Pricilla Torres-Fuentes
Cultural Resources Analyst

Attachment

Native American Heritage Commission
Native American Contact List
Imperial County
12/27/2022

Barona Group of the Capitan Grande
Raymond Welch, Chairperson
1095 Barona Road — Diegueno
Lakeside, CA, 92040
Phone: (619) 443 - 6612
Fax: (619) 443-0681
counciloffice@barona-nsn.gov

Campo Band of Diegueno Mission Indians
Ralph Goff, Chairperson
36190 Church Road, Suite 1 — Diegueno
Campo, CA, 91906
Phone: (619) 478 - 9046
Fax: (619) 478-5818
rgoff@campo-nsn.gov

Ewiiaapaayp Band of Kumeyaay Indians
Michael Garcia, Vice Chairperson
4054 Willows Road — Diegueno
Alpine, CA, 91901
Phone: (619) 933 - 2200
Fax: (619) 445-9126
michaelg@leaningrock.net

Ewiiaapaayp Band of Kumeyaay Indians
Robert Pinto, Chairperson
4054 Willows Road — Diegueno
Alpine, CA, 91901
Phone: (619) 368 - 4382
Fax: (619) 445-9126
ceo@ebki-nsn.gov

Iipay Nation of Santa Ysabel
Virgil Perez, Chairperson
P.O. Box 130 — Diegueno
Santa Ysabel, CA, 92070
Phone: (760) 765 - 0845
Fax: (760) 765-0320

Iipay Nation of Santa Ysabel
Clint Linton, Director of Cultural Resources
P.O. Box 507 — Diegueno
Santa Ysabel, CA, 92070
Phone: (760) 803 - 5694
clint@redtailenvironmental.com

Inaja-Cosmit Band of Indians
Rebecca Osuna, Chairperson
2005 S. Escondido Blvd. — Diegueno
Escondido, CA, 92025
Phone: (760) 737 - 7628
Fax: (760) 747-8568

Jamul Indian Village
Erica Pinto, Chairperson
P.O. Box 612 — Diegueno
Jamul, CA, 91935
Phone: (619) 669 - 4785
Fax: (619) 669-4817
epinto@jiv-nsn.gov

Jamul Indian Village
Lisa Cumper, Tribal Historic Preservation Officer
P.O. Box 612 — Diegueno
Jamul, CA, 91935
Phone: (619) 669 - 4855
lcumper@jiv-nsn.gov

Kwaaymii Laguna Band of Mission Indians
Carmen Lucas,
P.O. Box 775 — Kwaaymii
Pine Valley, CA, 91962 — Diegueno
Phone: (619) 709 - 4207

La Posta Band of Diegueno Mission Indians
Gwendolyn Parada, Chairperson
8 Crestwood Road — Diegueno
Boulevard, CA, 91905
Phone: (619) 478 - 2113
Fax: (619) 478-2125
LP13boots@aol.com

La Posta Band of Diegueno Mission Indians
Javaughn Miller, Tribal Administrator
8 Crestwood Road — Diegueno
Boulevard, CA, 91905
Phone: (619) 478 - 2113
Fax: (619) 478-2125
jmiller@LPtribe.net

This list is current only as of the date of this document. Distribution of this list does not relieve any person of statutory responsibility as defined in Section 7050.5 of the Health and Safety Code, Section 5097.94 of the Public Resource Section 5097.98 of the Public Resources Code.

This list is only applicable for contacting local Native Americans with regard to cultural resources assessment for the proposed SDSU Brawley Lithium Research Hub/STEM Facility Project, Imperial County.

Native American Heritage Commission
Native American Contact List
Imperial County
12/27/2022

Manzanita Band of Kumeyaay Nation
Angela Elliott Santos, Chairperson
P.O. Box 1302 — Diegueno
Boulevard, CA, 91905
Phone: (619) 766 - 4930
Fax: (619) 766-4957

Mesa Grande Band of Diegueno Mission Indians
Michael Linton, Chairperson
P.O Box 270 — Diegueno
Santa Ysabel, CA, 92070
Phone: (760) 782 - 3818
Fax: (760) 782-9092
mesagrandeband@msn.com

Quechan Tribe of the Fort Yuma Reservation
Manfred Scott, Acting Chairman
Kw'ts'an Cultural Committee
P.O. Box 1899 — Quechan
Yuma, AZ, 85366
Phone: (928) 750 - 2516
scottmanfred@yahoo.com

Quechan Tribe of the Fort Yuma Reservation
Jill McCormick, Historic Preservation Officer
P.O. Box 1899 — Quechan
Yuma, AZ, 85366
Phone: (760) 572 - 2423
historicpreservation@quechantribe.com

San Pasqual Band of Diegueno Mission Indians
John Flores, Environmental Coordinator
P. O. Box 365 — Diegueno
Valley Center, CA, 92082
Phone: (760) 749 - 3200
Fax: (760) 749-3876
johnf@sanpasqualtribe.org

San Pasqual Band of Diegueno Mission Indians
Allen Lawson, Chairperson
P.O. Box 365 — Diegueno
Valley Center, CA, 92082
Phone: (760) 749 - 3200
Fax: (760) 749-3876
allenl@sanpasqualtribe.org

Sycuan Band of the Kumeyaay Nation
Kristie Orosco, Kumeyaay Resource Specialist
1 Kwaaypaay Court — Kumeyaay
El Cajon, CA, 92019
Phone: (619) 445 - 6917

Sycuan Band of the Kumeyaay Nation
Cody Martinez, Chairperson
1 Kwaaypaay Court — Kumeyaay
El Cajon, CA, 92019
Phone: (619) 445 - 2613
Fax: (619) 445-1927
ssilva@sycuan-nsn.gov

Viejas Band of Kumeyaay Indians
John Christman, Chairperson
1 Viejas Grade Road — Diegueno
Alpine, CA, 91901
Phone: (619) 445 - 3810
Fax: (619) 445-5337

Viejas Band of Kumeyaay Indians
Ernest Pingleton, Tribal Historic Officer, Resource Management
1 Viejas Grade Road — Diegueno
Alpine, CA, 91901
Phone: (619) 659 - 2314
epingleton@viejas-nsn.gov

This list is current only as of the date of this document. Distribution of this list does not relieve any person of statutory responsibility as defined in Section 7050.5 of the Health and Safety Code, Section 5097.94 of the Public Resource Section 5097.98 of the Public Resources Code.

This list is only applicable for contacting local Native Americans with regard to cultural resources assessment for the proposed SDSU Brawley Lithium Research Hub/STEM Facility Project, Imperial County.

DUDEK
MAIN OFFICE
605 THIRD STREET
ENCINITAS, CALIFORNIA 92024
T 800.450.1818 F 760.632.0164

February 21, 2023 14812

Mr. Raymond Welch, Chairperson
Barona Group of the Capitan Grande
1095 Barona Road
Lakeside, CA 92040

Subject: Information Request for the SDSU Brawley Lithium Research Hub/STEM Facility Project in City of Brawley, California

Dear Mr. Welch,

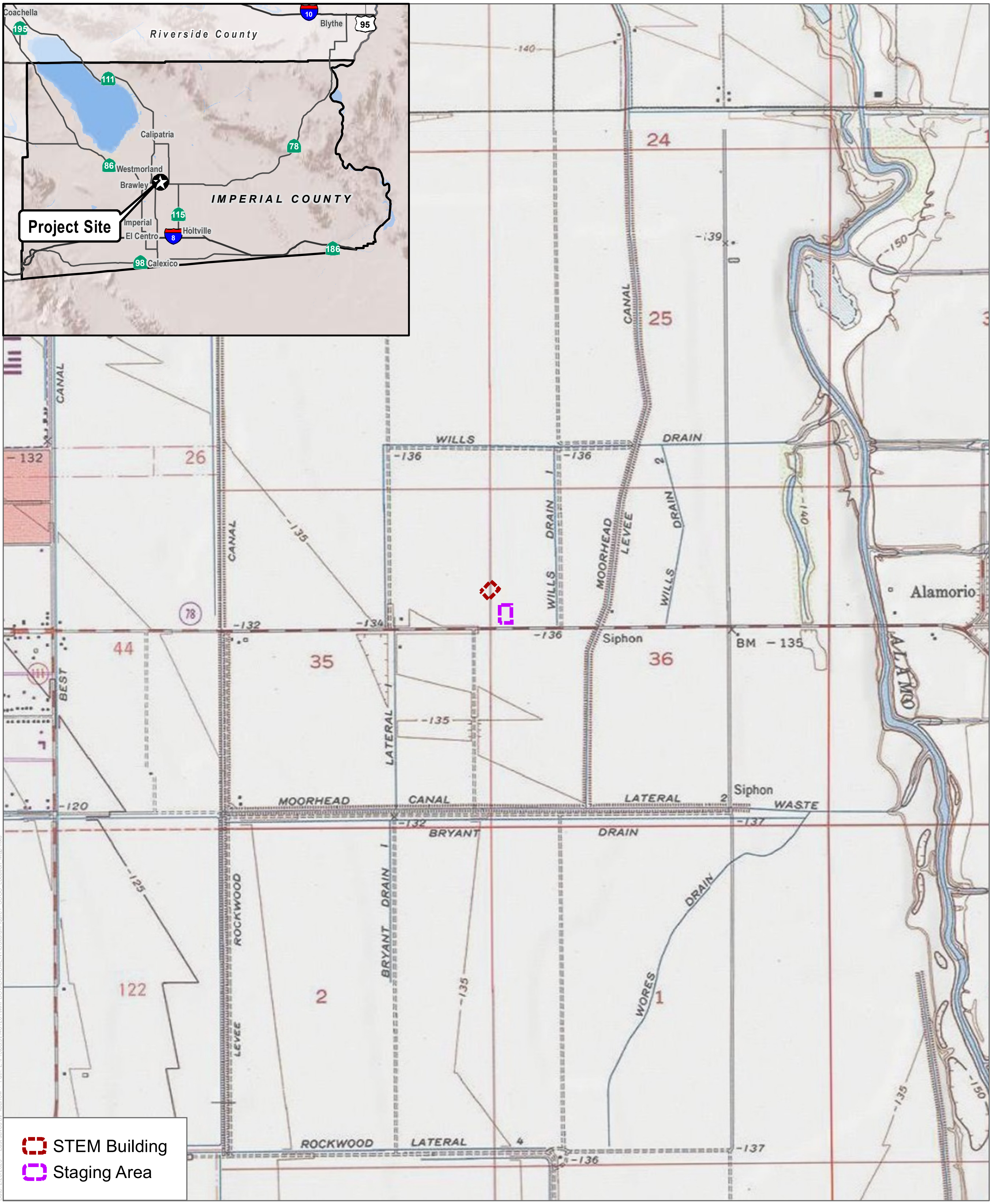
California State University/San Diego State University (CSU/SDSU) is proposing to construct a new educational/research building on the CSU/SDSU Brawley campus. The proposed Brawley Lithium Research Hub/STEM Facility Project (Project) would involve the construction and operation of a 39,098 gross square foot Lithium Research Hub/STEM research and instruction facility. The Project area falls within Sections 35 and 36 of Township 13 South, Range 14 East of the Alamorio, California 7.5-minute Quadrangle (See Figure 1). The new standalone building would house laboratory, lecture, and research space and would be developed in furtherance of the previously approved SDSU Brawley Campus Master Plan (Figure 2).

In response to our request, the Native American Heritage Commission conducted a Sacred Lands file search of the area surrounding the Project vicinity. The results of the search were positive. I am writing as part of the cultural inventory process in order to find out if you, or your tribal community, have any knowledge of cultural resources or places that may be impacted by the proposed Project.

If you have any information or concerns pertaining to such information, please contact me as soon as possible. Thank you for your cooperation and assistance.

Respectfully,

Keshia Montifolca, M.A., RPA
Archaeologist
DUDEK
Phone: (619) 949-3082
Email: kmontifolca@dudek.com



SOURCE: USGS 7.5-Minute Series Alamorio, Quadrangles
Township 13S; Range 14E; Sections 35, 36

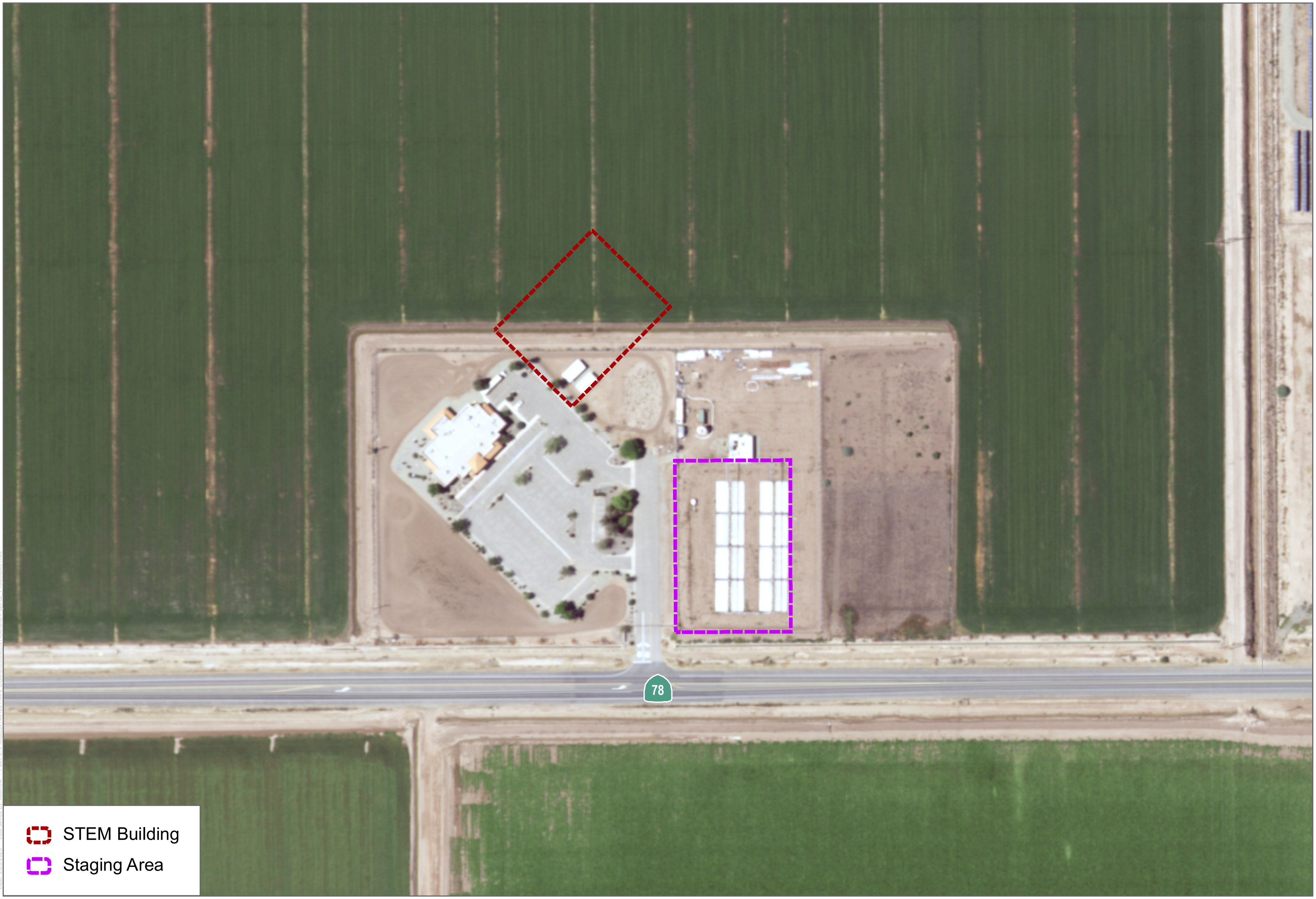
DUDEK

0 1,000 2,000 Feet
0 285 570 Meters
1:24,000

FIGURE 1

Project Location

SDSU Brawley STEM Facility Project



SOURCE: NAIP 2020

DUDEK

0 80 160 Feet

FIGURE 2

Project Area

SDSU Brawley STEM Facility Project

DUDEK
MAIN OFFICE
605 THIRD STREET
ENCINITAS, CALIFORNIA 92024
T 800.450.1818 F 760.632.0164

February 21, 2023 14812

Mr. Ralph Goff, Chairperson
Campo Band of Diegueno Mission Indians
36190 Church Road, Suite 1
Campo, CA 91906

Subject: Information Request for the SDSU Brawley Lithium Research Hub/STEM Facility Project in City of Brawley, California

Dear Mr. Goff,

California State University/San Diego State University (CSU/SDSU) is proposing to construct a new educational/research building on the CSU/SDSU Brawley campus. The proposed Brawley Lithium Research Hub/STEM Facility Project (Project) would involve the construction and operation of a 39,098 gross square foot Lithium Research Hub/STEM research and instruction facility. The Project area falls within Sections 35 and 36 of Township 13 South, Range 14 East of the Alamorio, California 7.5-minute Quadrangle (See Figure 1). The new standalone building would house laboratory, lecture, and research space and would be developed in furtherance of the previously approved SDSU Brawley Campus Master Plan (Figure 2).

In response to our request, the Native American Heritage Commission conducted a Sacred Lands file search of the area surrounding the Project vicinity. The results of the search were positive. I am writing as part of the cultural inventory process in order to find out if you, or your tribal community, have any knowledge of cultural resources or places that may be impacted by the proposed Project.

If you have any information or concerns pertaining to such information, please contact me as soon as possible. Thank you for your cooperation and assistance.

Respectfully,

Keshia Montifolca, M.A., RPA
Archaeologist
DUDEK
Phone: (619) 949-3082
Email: kmontifolca@dudek.com

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February 21, 2023 14812

Mr. Robert Pinto, Chairperson
Ewiaapaayp Band of Kumeyaay Indians
4054 Willow Rd.
Alpine, CA 91901

Subject: Information Request for the SDSU Brawley Lithium Research Hub/STEM Facility Project in City of Brawley, California

Dear Mr. Pinto,

California State University/San Diego State University (CSU/SDSU) is proposing to construct a new educational/research building on the CSU/SDSU Brawley campus. The proposed Brawley Lithium Research Hub/STEM Facility Project (Project) would involve the construction and operation of a 39,098 gross square foot Lithium Research Hub/STEM research and instruction facility. The Project area falls within Sections 35 and 36 of Township 13 South, Range 14 East of the Alamorio, California 7.5-minute Quadrangle (See Figure 1). The new standalone building would house laboratory, lecture, and research space and would be developed in furtherance of the previously approved SDSU Brawley Campus Master Plan (Figure 2).

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February 21, 2023 14812

Mr. Michael Garcia, Vice Chairperson
Ewiiaapaayp Band of Kumeyaay Indians
4054 Willows Road
Alpine, CA 91901

Subject: Information Request for the SDSU Brawley Lithium Research Hub/STEM Facility Project in City of Brawley, California

Dear Mr. Garcia,

California State University/San Diego State University (CSU/SDSU) is proposing to construct a new educational/research building on the CSU/SDSU Brawley campus. The proposed Brawley Lithium Research Hub/STEM Facility Project (Project) would involve the construction and operation of a 39,098 gross square foot Lithium Research Hub/STEM research and instruction facility. The Project area falls within Sections 35 and 36 of Township 13 South, Range 14 East of the Alamorio, California 7.5-minute Quadrangle (See Figure 1). The new standalone building would house laboratory, lecture, and research space and would be developed in furtherance of the previously approved SDSU Brawley Campus Master Plan (Figure 2).

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February 21, 2023 14812

Mr. Virgil Perez, Chairperson
Iipay Nation of Santa Ysabel
P.O. Box 130
Santa Ysabel, CA 92070

Subject: Information Request for the SDSU Brawley Lithium Research Hub/STEM Facility Project in City of Brawley, California

Dear Mr. Perez,

California State University/San Diego State University (CSU/SDSU) is proposing to construct a new educational/research building on the CSU/SDSU Brawley campus. The proposed Brawley Lithium Research Hub/STEM Facility Project (Project) would involve the construction and operation of a 39,098 gross square foot Lithium Research Hub/STEM research and instruction facility. The Project area falls within Sections 35 and 36 of Township 13 South, Range 14 East of the Alamorio, California 7.5-minute Quadrangle (See Figure 1). The new standalone building would house laboratory, lecture, and research space and would be developed in furtherance of the previously approved SDSU Brawley Campus Master Plan (Figure 2).

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February 21, 2023 14812

Ms. Rebecca Osuna, Chairperson
Inaja-Cosmit Band of Indians
2005 S. Escondido Blvd.
Escondido, CA 92025

Subject: Information Request for the SDSU Brawley Lithium Research Hub/STEM Facility Project in City of Brawley, California

Dear Ms. Osuna,

California State University/San Diego State University (CSU/SDSU) is proposing to construct a new educational/research building on the CSU/SDSU Brawley campus. The proposed Brawley Lithium Research Hub/STEM Facility Project (Project) would involve the construction and operation of a 39,098 gross square foot Lithium Research Hub/STEM research and instruction facility. The Project area falls within Sections 35 and 36 of Township 13 South, Range 14 East of the Alamorio, California 7.5-minute Quadrangle (See Figure 1). The new standalone building would house laboratory, lecture, and research space and would be developed in furtherance of the previously approved SDSU Brawley Campus Master Plan (Figure 2).

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February 21, 2023 14812

Mr. Clint Linton, Director of Cultural Resources
Ipay Nation of Santa Ysabel
P.O. Box 507
Santa Ysabel, CA 92070

Subject: Information Request for the SDSU Brawley Lithium Research Hub/STEM Facility Project in City of Brawley, California

Dear Mr. Linton,

California State University/San Diego State University (CSU/SDSU) is proposing to construct a new educational/research building on the CSU/SDSU Brawley campus. The proposed Brawley Lithium Research Hub/STEM Facility Project (Project) would involve the construction and operation of a 39,098 gross square foot Lithium Research Hub/STEM research and instruction facility. The Project area falls within Sections 35 and 36 of Township 13 South, Range 14 East of the Alamorio, California 7.5-minute Quadrangle (See Figure 1). The new standalone building would house laboratory, lecture, and research space and would be developed in furtherance of the previously approved SDSU Brawley Campus Master Plan (Figure 2).

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February 21, 2023 14812

Ms. Erica Pinto, Chairperson
Jamul Indian Village
P.O. Box 612
Jamul, CA 91935

Subject: Information Request for the SDSU Brawley Lithium Research Hub/STEM Facility Project in City of Brawley, California

Dear Ms. Pinto,

California State University/San Diego State University (CSU/SDSU) is proposing to construct a new educational/research building on the CSU/SDSU Brawley campus. The proposed Brawley Lithium Research Hub/STEM Facility Project (Project) would involve the construction and operation of a 39,098 gross square foot Lithium Research Hub/STEM research and instruction facility. The Project area falls within Sections 35 and 36 of Township 13 South, Range 14 East of the Alamorio, California 7.5-minute Quadrangle (See Figure 1). The new standalone building would house laboratory, lecture, and research space and would be developed in furtherance of the previously approved SDSU Brawley Campus Master Plan (Figure 2).

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February 21, 2023 14812

Ms. Lisa Cumper, THPO
Jamul Indian Village
P.O. Box 612
Jamul, CA 91935

Subject: Information Request for the SDSU Brawley Lithium Research Hub/STEM Facility Project in City of Brawley, California

Dear Ms. Cumper,

California State University/San Diego State University (CSU/SDSU) is proposing to construct a new educational/research building on the CSU/SDSU Brawley campus. The proposed Brawley Lithium Research Hub/STEM Facility Project (Project) would involve the construction and operation of a 39,098 gross square foot Lithium Research Hub/STEM research and instruction facility. The Project area falls within Sections 35 and 36 of Township 13 South, Range 14 East of the Alamorio, California 7.5-minute Quadrangle (See Figure 1). The new standalone building would house laboratory, lecture, and research space and would be developed in furtherance of the previously approved SDSU Brawley Campus Master Plan (Figure 2).

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February 21, 2023 14812

Ms. Carmen Lucas,
Kwaaymii Laguna Band of Mission Indians
P.O. Box 775
Pine Valley, CA 91962

Subject: Information Request for the SDSU Brawley Lithium Research Hub/STEM Facility Project in City of Brawley, California

Dear Ms. Lucas,

California State University/San Diego State University (CSU/SDSU) is proposing to construct a new educational/research building on the CSU/SDSU Brawley campus. The proposed Brawley Lithium Research Hub/STEM Facility Project (Project) would involve the construction and operation of a 39,098 gross square foot Lithium Research Hub/STEM research and instruction facility. The Project area falls within Sections 35 and 36 of Township 13 South, Range 14 East of the Alamorio, California 7.5-minute Quadrangle (See Figure 1). The new standalone building would house laboratory, lecture, and research space and would be developed in furtherance of the previously approved SDSU Brawley Campus Master Plan (Figure 2).

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February 21, 2023 14812

Ms. Javaughn Miller, Tribal Administrator
La Posta Band of Diegueno Mission Indians
8 Crestwood Rd.
Boulevard, CA 91905

Subject: Information Request for the SDSU Brawley Lithium Research Hub/STEM Facility Project in City of Brawley, California

Dear Ms. Miller,

California State University/San Diego State University (CSU/SDSU) is proposing to construct a new educational/research building on the CSU/SDSU Brawley campus. The proposed Brawley Lithium Research Hub/STEM Facility Project (Project) would involve the construction and operation of a 39,098 gross square foot Lithium Research Hub/STEM research and instruction facility. The Project area falls within Sections 35 and 36 of Township 13 South, Range 14 East of the Alamorio, California 7.5-minute Quadrangle (See Figure 1). The new standalone building would house laboratory, lecture, and research space and would be developed in furtherance of the previously approved SDSU Brawley Campus Master Plan (Figure 2).

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February 21, 2023 14812

Ms. Gwendolyn Parada, Chairperson
La Posta Band of Dieguneo Mission Indians
8 Crestwood Rd.
Boulevard, CA 91905

Subject: Information Request for the SDSU Brawley Lithium Research Hub/STEM Facility Project in City of Brawley, California

Dear Ms. Parada,

California State University/San Diego State University (CSU/SDSU) is proposing to construct a new educational/research building on the CSU/SDSU Brawley campus. The proposed Brawley Lithium Research Hub/STEM Facility Project (Project) would involve the construction and operation of a 39,098 gross square foot Lithium Research Hub/STEM research and instruction facility. The Project area falls within Sections 35 and 36 of Township 13 South, Range 14 East of the Alamorio, California 7.5-minute Quadrangle (See Figure 1). The new standalone building would house laboratory, lecture, and research space and would be developed in furtherance of the previously approved SDSU Brawley Campus Master Plan (Figure 2).

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February 21, 2023 14812

Ms. Angela Elliott Santos, Chairperson
Manzanita Band of Kumeyaay Nation
P.O. Box 1302
Boulevard, CA 91905

Subject: Information Request for the SDSU Brawley Lithium Research Hub/STEM Facility Project in City of Brawley, California

Dear Ms. Santos,

California State University/San Diego State University (CSU/SDSU) is proposing to construct a new educational/research building on the CSU/SDSU Brawley campus. The proposed Brawley Lithium Research Hub/STEM Facility Project (Project) would involve the construction and operation of a 39,098 gross square foot Lithium Research Hub/STEM research and instruction facility. The Project area falls within Sections 35 and 36 of Township 13 South, Range 14 East of the Alamorio, California 7.5-minute Quadrangle (See Figure 1). The new standalone building would house laboratory, lecture, and research space and would be developed in furtherance of the previously approved SDSU Brawley Campus Master Plan (Figure 2).

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February 21, 2023 14812

Mr. Michael Linton, Chairperson
Mesa Grande Band of Dieguneo Mission Indians
P.O. Box 270
Santa Ysabel, CA 92070

Subject: Information Request for the SDSU Brawley Lithium Research Hub/STEM Facility Project in City of Brawley, California

Dear Mr. Linton,

California State University/San Diego State University (CSU/SDSU) is proposing to construct a new educational/research building on the CSU/SDSU Brawley campus. The proposed Brawley Lithium Research Hub/STEM Facility Project (Project) would involve the construction and operation of a 39,098 gross square foot Lithium Research Hub/STEM research and instruction facility. The Project area falls within Sections 35 and 36 of Township 13 South, Range 14 East of the Alamorio, California 7.5-minute Quadrangle (See Figure 1). The new standalone building would house laboratory, lecture, and research space and would be developed in furtherance of the previously approved SDSU Brawley Campus Master Plan (Figure 2).

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February 21, 2023 14812

Ms. Jill McCormick, Historic Preservation Officer
Quechan Tribe of the Fort Yuma Reservation
P.O. Box 1899
Yuma, AZ 85366

Subject: Information Request for the SDSU Brawley Lithium Research Hub/STEM Facility Project in City of Brawley, California

Dear Ms. McCormick,

California State University/San Diego State University (CSU/SDSU) is proposing to construct a new educational/research building on the CSU/SDSU Brawley campus. The proposed Brawley Lithium Research Hub/STEM Facility Project (Project) would involve the construction and operation of a 39,098 gross square foot Lithium Research Hub/STEM research and instruction facility. The Project area falls within Sections 35 and 36 of Township 13 South, Range 14 East of the Alamorio, California 7.5-minute Quadrangle (See Figure 1). The new standalone building would house laboratory, lecture, and research space and would be developed in furtherance of the previously approved SDSU Brawley Campus Master Plan (Figure 2).

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February 21, 2023 14812

Mr. Manfred Scott, Acting Chairman
Quechan Tribe of the Fort Yuma Reservation
P.O. Box 1899
Yuma, AZ 85366

Subject: Information Request for the SDSU Brawley Lithium Research Hub/STEM Facility Project in City of Brawley, California

Dear Mr. Scott,

California State University/San Diego State University (CSU/SDSU) is proposing to construct a new educational/research building on the CSU/SDSU Brawley campus. The proposed Brawley Lithium Research Hub/STEM Facility Project (Project) would involve the construction and operation of a 39,098 gross square foot Lithium Research Hub/STEM research and instruction facility. The Project area falls within Sections 35 and 36 of Township 13 South, Range 14 East of the Alamorio, California 7.5-minute Quadrangle (See Figure 1). The new standalone building would house laboratory, lecture, and research space and would be developed in furtherance of the previously approved SDSU Brawley Campus Master Plan (Figure 2).

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February 21, 2023 14812

Mr. Allen E. Lawson, Chairperson
San Pasqual Band of Dieguenо Mission Indians
P.O. Box 365
Valley Center, CA 92082

Subject: Information Request for the SDSU Brawley Lithium Research Hub/STEM Facility Project in City of Brawley, California

Dear Mr. Lawson,

California State University/San Diego State University (CSU/SDSU) is proposing to construct a new educational/research building on the CSU/SDSU Brawley campus. The proposed Brawley Lithium Research Hub/STEM Facility Project (Project) would involve the construction and operation of a 39,098 gross square foot Lithium Research Hub/STEM research and instruction facility. The Project area falls within Sections 35 and 36 of Township 13 South, Range 14 East of the Alamorio, California 7.5-minute Quadrangle (See Figure 1). The new standalone building would house laboratory, lecture, and research space and would be developed in furtherance of the previously approved SDSU Brawley Campus Master Plan (Figure 2).

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February 21, 2023 14812

Mr. John Flores, Environmental Coordinator
San Pasqual Band of Diegueno Mission Indians
P.O. Box 365
Valley Center, CA 92082

Subject: Information Request for the SDSU Brawley Lithium Research Hub/STEM Facility Project in City of Brawley, California

Dear Mr. Flores,

California State University/San Diego State University (CSU/SDSU) is proposing to construct a new educational/research building on the CSU/SDSU Brawley campus. The proposed Brawley Lithium Research Hub/STEM Facility Project (Project) would involve the construction and operation of a 39,098 gross square foot Lithium Research Hub/STEM research and instruction facility. The Project area falls within Sections 35 and 36 of Township 13 South, Range 14 East of the Alamorio, California 7.5-minute Quadrangle (See Figure 1). The new standalone building would house laboratory, lecture, and research space and would be developed in furtherance of the previously approved SDSU Brawley Campus Master Plan (Figure 2).

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February 21, 2023 14812

Ms. Kristie Orosco, Resource Specialist
Sycuan Band of the Kumeyaay Nation
1 Kwaaypaay Court
El Cajon, CA 92019

Subject: Information Request for the SDSU Brawley Lithium Research Hub/STEM Facility Project in City of Brawley, California

Dear Ms. Orosco,

California State University/San Diego State University (CSU/SDSU) is proposing to construct a new educational/research building on the CSU/SDSU Brawley campus. The proposed Brawley Lithium Research Hub/STEM Facility Project (Project) would involve the construction and operation of a 39,098 gross square foot Lithium Research Hub/STEM research and instruction facility. The Project area falls within Sections 35 and 36 of Township 13 South, Range 14 East of the Alamorio, California 7.5-minute Quadrangle (See Figure 1). The new standalone building would house laboratory, lecture, and research space and would be developed in furtherance of the previously approved SDSU Brawley Campus Master Plan (Figure 2).

In response to our request, the Native American Heritage Commission conducted a Sacred Lands file search of the area surrounding the Project vicinity. The results of the search were positive. I am writing as part of the cultural inventory process in order to find out if you, or your tribal community, have any knowledge of cultural resources or places that may be impacted by the proposed Project.

If you have any information or concerns pertaining to such information, please contact me as soon as possible. Thank you for your cooperation and assistance.

Respectfully,

Keshia Montifolca, M.A., RPA
Archaeologist
DUDEK
Phone: (619) 949-3082
Email: kmontifolca@dudek.com

DUDEK
MAIN OFFICE
605 THIRD STREET
ENCINITAS, CALIFORNIA 92024
T 800.450.1818 F 760.632.0164

February 21, 2023 14812

Mr. Cody Martinez, Chairperson
Sycuan Band of the Kumeyaay Nation
1 Kwaaypaay Court
El Cajon, CA 92019

Subject: Information Request for the SDSU Brawley Lithium Research Hub/STEM Facility Project in City of Brawley, California

Dear Mr. Martinez,

California State University/San Diego State University (CSU/SDSU) is proposing to construct a new educational/research building on the CSU/SDSU Brawley campus. The proposed Brawley Lithium Research Hub/STEM Facility Project (Project) would involve the construction and operation of a 39,098 gross square foot Lithium Research Hub/STEM research and instruction facility. The Project area falls within Sections 35 and 36 of Township 13 South, Range 14 East of the Alamorio, California 7.5-minute Quadrangle (See Figure 1). The new standalone building would house laboratory, lecture, and research space and would be developed in furtherance of the previously approved SDSU Brawley Campus Master Plan (Figure 2).

In response to our request, the Native American Heritage Commission conducted a Sacred Lands file search of the area surrounding the Project vicinity. The results of the search were positive. I am writing as part of the cultural inventory process in order to find out if you, or your tribal community, have any knowledge of cultural resources or places that may be impacted by the proposed Project.

If you have any information or concerns pertaining to such information, please contact me as soon as possible. Thank you for your cooperation and assistance.

Respectfully,

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ENCINITAS, CALIFORNIA 92024
T 800.450.1818 F 760.632.0164

February 21, 2023 14812

Mr. John Christman, Chairperson
Viejas Band of Kumeyaay Indians
1 Viejas Grade Rd.
Alpine, CA 91901

Subject: Information Request for the SDSU Brawley Lithium Research Hub/STEM Facility Project in City of Brawley, California

Dear Mr. Christman,

California State University/San Diego State University (CSU/SDSU) is proposing to construct a new educational/research building on the CSU/SDSU Brawley campus. The proposed Brawley Lithium Research Hub/STEM Facility Project (Project) would involve the construction and operation of a 39,098 gross square foot Lithium Research Hub/STEM research and instruction facility. The Project area falls within Sections 35 and 36 of Township 13 South, Range 14 East of the Alamorio, California 7.5-minute Quadrangle (See Figure 1). The new standalone building would house laboratory, lecture, and research space and would be developed in furtherance of the previously approved SDSU Brawley Campus Master Plan (Figure 2).

In response to our request, the Native American Heritage Commission conducted a Sacred Lands file search of the area surrounding the Project vicinity. The results of the search were positive. I am writing as part of the cultural inventory process in order to find out if you, or your tribal community, have any knowledge of cultural resources or places that may be impacted by the proposed Project.

If you have any information or concerns pertaining to such information, please contact me as soon as possible. Thank you for your cooperation and assistance.

Respectfully,

Keshia Montifolca, M.A., RPA
Archaeologist
DUDEK
Phone: (619) 949-3082
Email: kmontifolca@dudek.com

DUDEK
MAIN OFFICE
605 THIRD STREET
ENCINITAS, CALIFORNIA 92024
T 800.450.1818 F 760.632.0164

February 21, 2023 14812

Mr. Ernest Pingleton, Tribal Historic Officer
Viejas Band of Kumeyaay Indians
1 Viejas Grade Rd.
Alpine, CA 91901

Subject: Information Request for the SDSU Brawley Lithium Research Hub/STEM Facility Project in City of Brawley, California

Dear Mr. Pingleton,

California State University/San Diego State University (CSU/SDSU) is proposing to construct a new educational/research building on the CSU/SDSU Brawley campus. The proposed Brawley Lithium Research Hub/STEM Facility Project (Project) would involve the construction and operation of a 39,098 gross square foot Lithium Research Hub/STEM research and instruction facility. The Project area falls within Sections 35 and 36 of Township 13 South, Range 14 East of the Alamorio, California 7.5-minute Quadrangle (See Figure 1). The new standalone building would house laboratory, lecture, and research space and would be developed in furtherance of the previously approved SDSU Brawley Campus Master Plan (Figure 2).

In response to our request, the Native American Heritage Commission conducted a Sacred Lands file search of the area surrounding the Project vicinity. The results of the search were positive. I am writing as part of the cultural inventory process in order to find out if you, or your tribal community, have any knowledge of cultural resources or places that may be impacted by the proposed Project.

If you have any information or concerns pertaining to such information, please contact me as soon as possible. Thank you for your cooperation and assistance.

Respectfully,

Keshia Montifolca, M.A., RPA
Archaeologist
DUDEK
Phone: (619) 949-3082
Email: kmontifolca@dudek.com

Keshia Montifolca

From:	Jill McCormick <historicpreservation@quechantribe.com>
Sent:	Thursday, March 2, 2023 12:12 PM
To:	Keshia Montifolca
Subject:	RE: SDSU Brawley Lithium Research Hub/STEAM Facility Project in the City of Brawley, CA
Importance:	High

Please disregard my previous email. See corrected response below.

This email is to inform you that we do not wish to comment on this project.

Thank you,
H. Jill McCormick, M.A.

Quechan Indian Tribe
Historic Preservation Officer
P.O. Box 1899
Yuma, AZ 85366-1899
Office: 760-572-2423
Cell: 928-261-0254
E-mail: historicpreservation@quechantribe.com

From: Jill McCormick
Sent: Thursday, March 02, 2023 1:11 PM
To: Keshia Montifolca <kmontifolca@dudek.com>
Subject: SDSU Brawley Lithium Research Hub/STEAM Facility Project in the City of Brawley, CA

This email is to inform you that we do not wish to comment on this project. We defer to the more local Tribes and support their determinations on this matter.

Thank you,
H. Jill McCormick, M.A.

Quechan Indian Tribe
Historic Preservation Officer

Keshia Montifolca

From: Lisa Cumper <lcumper@jiv-nsn.gov>
Sent: Wednesday, March 8, 2023 1:10 PM
To: Keshia Montifolca
Subject: Re: Information Request for the SDSU Brawley Lithium Research Hub/STEM Facility Project, Brawley, CA

Hi Keshia,

We would like to defer to wishes of a closer tribe please.

Thank you,
Lisa

On Tue, Mar 7, 2023 at 11:39 AM Keshia Montifolca <kmontifolca@dudek.com> wrote:

> Dear Ms. Cumper,
>
> California State University/San Diego State University (CSU/SDSU) is proposing to construct a new educational/research building on the CSU/SDSU Brawley campus. The proposed Brawley Lithium Research Hub/STEM Facility Project (Project) would involve the construction and operation of a 39,098 gross square foot Lithium Research Hub/STEM research and instruction facility. The Project area falls within Sections 35 and 36 of Township 13 South, Range 14 East of the Alamorio, California 7.5-minute Quadrangle (See Figure 1). The new standalone building would house laboratory, lecture, and research space and would be developed in furtherance of the previously approved SDSU Brawley Campus Master Plan (Figure 2).
>
> In response to our request, the Native American Heritage Commission conducted a Sacred Lands file search of the area surrounding the Project vicinity. The results of the search were positive. I am writing as part of the cultural inventory process in order to find out if you, or your tribal community, have any knowledge of cultural resources or places that may be impacted by the proposed Project.
>
> If you have any information or concerns pertaining to such information, please contact me as soon as possible. Thank you for your cooperation and assistance.
>
> Thank you,
>
> **Keshia Montifolca, M.A., RPA**
>
> Archaeologist
>
> DUDE
>
> 605 Third Street, Encinitas, CA 92024
>
> O: 619.949.3082 C: 619.372.6255

Keshia Montifolca

From:	Ray Teran <rteran@viejas-nsn.gov>
Sent:	Friday, March 10, 2023 9:29 AM
To:	Keshia Montifolca
Cc:	Ernest Pingleton
Subject:	RE: Information Request for the SDSU Brawley Lithium Research Hub/STEM Facility Project, Brawley, CA

The Viejas Band of Kumeyaay Indians ("Viejas") has reviewed the proposed project and at this time we have determined that the project site has cultural significance or ties to Viejas. Cultural resources have been located within or adjacent to the APE-DE of the proposed project.

Viejas Band request that a Kumeyaay Cultural Monitor be on site for ground disturbing activities and to inform us of any new developments such as inadvertent discovery of cultural artifacts, cremation sites, or human remains.

If you wish to utilize Viejas cultural monitors (Viejas rate is $54.15/hr. plus GSA mileage), please call Ernest Pingleton at 619-655-0410 or email, epingleton@viejas-nsn.gov, for contracting and scheduling. Thank you.

If a Tribe, having a closer proximity to the Project, requests to perform cultural monitoring, Viejas will differ to them.

From: Keshia Montifolca <kmontifolca@dudek.com>
Sent: Friday, March 10, 2023 8:58 AM
To: Ray Teran <rteran@viejas-nsn.gov>
Cc: Ernest Pingleton <epingleton@viejas-nsn.gov>
Subject: RE: Information Request for the SDSU Brawley Lithium Research Hub/STEM Facility Project, Brawley, CA

Good morning Mr. Teran,

SDSU is proposing to construct a new educational/research building on the SDSU Brawley campus. Currently, the Brawley campus has been partially built out with educational and support facilities, although much of the campus remains undeveloped or used for active agriculture. The proposed project would involve the construction and operation of a 39,098 gross square foot building that would be approximately 35 feet in height and include lower and upper division teaching labs, interdisciplinary lecture space, faculty/administrative offices, research and research services space, conference rooms and mechanical, electrical and telecom support spaces. The proposed project site is approximately 1.5-acres in size (63,000 square feet [sf]) and is located northeast of existing campus Building 101, and the associated parking lot. Project construction staging areas would occupy approximately 52,000 sf in the area of campus located southeast of the site and north of SR 78.

Regarding ground disturbance, the project would involve site preparation, grading, and excavation associated with project construction.

Respectfully,

Keshia Montifolca, M.A., RPA
Archaeologist

605 Third Street, Encinitas, CA 92024
O: 619.949.3082 C: 619.372.6255
www.dudek.com

From: Ray Teran <rteran@viejas-nsn.gov>
Sent: Wednesday, March 8, 2023 1:28 PM
To: Keshia Montifolca <kmontifolca@dudek.com>
Cc: Ernest Pingleton <epingleton@viejas-nsn.gov>
Subject: FW: Information Request for the SDSU Brawley Lithium Research Hub/STEM Facility Project, Brawley, CA

Please provide us with the project plan/description, specifically any anticipated ground disturbance. THX

From: Keshia Montifolca <kmontifolca@dudek.com>
Date: March 7, 2023 at 9:40:05 AM PST
To: Ernest Pingleton <epingleton@viejas-nsn.gov>
Subject: Information Request for the SDSU Brawley Lithium Research Hub/STEM Facility Project, Brawley, CA

Dear Mr. Pingleton,

California State University/San Diego State University (CSU/SDSU) is proposing to construct a new educational/research building on the CSU/SDSU Brawley campus. The proposed Brawley Lithium Research Hub/STEM Facility Project (Project) would involve the construction and operation of a 39,098 gross square foot Lithium Research Hub/STEM research and instruction facility. The Project area falls within Sections 35 and 36 of Township 13 South, Range 14 East of the Alamorio, California 7.5-minute Quadrangle (See Figure 1). The new standalone building would house laboratory, lecture, and research space and would be developed in furtherance of the previously approved SDSU Brawley Campus Master Plan (Figure 2).

In response to our request, the Native American Heritage Commission conducted a Sacred Lands file search of the area surrounding the Project vicinity. The results of the search were positive. I am writing as part of the cultural inventory process in order to find out if you, or your tribal community, have any knowledge of cultural resources or places that may be impacted by the proposed Project.

If you have any information or concerns pertaining to such information, please contact me as soon as possible. Thank you for your cooperation and assistance.

Thank you,

Keshia Montifolca, M.A., RPA
Archaeologist

605 Third Street, Encinitas, CA 92024
O: 619.949.3082 C: 619.372.6255
www.dudek.com

IPAI

SAN PASQUAL BAND OF MISSION INDIANS

SAN PASQUAL RESERVATION

April 18, 2023

DUDEK
Keshaia Montiflolca

RE: SDSU Brawley Lithium Research Hub/STEM Facility

Dear Ms. Montifolca,

The San Pasqual Band of Mission Indians Tribal Historic Preservation Office has received your notification of the project referenced above. This letter constitutes our response on behalf of Desiree M. Whitman THPO of the San Pasqual Band of Diegueno Indians.

We have consulted our maps and determined that the project as described is not within the boundaries of the recognized San Pasqual Indian Reservation. It is, however, within the boundaries of the territory that the tribe considers its Traditional Use Area (TUA). Furthermore, As the project progresses, we would like to engage in formal government-to-government consultation under CEQA so that San Pasqual can have a voice in the development of the measures that will be taken to protect these sites and mitigate any adverse impacts. We would appreciate being given access to any cultural resource reports that have been or will be generated during the environmental review process so we can contribute most effectively to the consultation process.

We appreciate your involvement with your initiative and look forward to working with you on future efforts. If you have questions or need additional information, please do not hesitate to contact me by telephone at 760-651-5142 or angelinag@sanpasqualtribe.org

Sincerely,

Angelina Gutierrez

Angelina Gutierrez
Tribal Historic Preservation Office, Deputy THPO/Monitor Supervisor
San Pasqual Band of Mission Indians

Attachment E
Assembly Bill 52 Outreach Letter Example

SAN DIEGO STATE UNIVERSITY

Planning, Design and Construction
Business and Financial Affairs
5500 Campanile Drive
San Diego CA 92182 · 1624
Tel: 619 · 594 · 5224
Fax: 619 · 594 · 4500

March 13, 2023

Mr. Raymond Welch, Chairperson
Barona Group of the Capitan Grande
1095 Barona Road
Lakeside, CA 92040

Re: Notification of the Proposed SDSU Brawley Lithium Research Hub/STEM Facility Project Pursuant to California Assembly Bill 52.

Dear Mr. Welch:

Pursuant to California Assembly Bill (AB) 52, San Diego State University (SDSU), as a representative of the Board of Trustees of the California State University, is providing you with notification of the SDSU Brawley Lithium Research Hub/STEM Facility Project (proposed project), located east of the City of Brawley, in Imperial County, California. While SDSU has not yet received a request from your tribe to be notified of specific projects within a designated geographic area, we are reaching out to all groups listed on the California Native American Heritage Commission's Sacred Lands File consultation list in a good faith effort to provide notification of the proposed project to groups that are traditionally or culturally affiliated with the geographic area of the proposed project.

Project Location

The proposed project is to be constructed at SDSU's Brawley Campus, located at 560 California State Route (SR) 78, Brawley, CA 92227. Regional access to the campus is provided by SR 111 and SR 86 to the west and northwest, respectively, and SR 115 to the east. The proposed project site is bound to the north and east by agricultural and undeveloped land, to the south by SR 78, and to the west by agricultural support uses. The proposed project site falls within Sections 35 and 36 of Township 13 South, Range 14 East of the Alamorio, California 7.5-minute quadrangle, as mapped by the U.S. Geological Survey (Figure 1, Project Location Map).

Project Description

SDSU is proposing to construct a new educational/research building on the SDSU Brawley campus. Currently, the Brawley campus has been partially built out with educational and support facilities, although much of the campus remains undeveloped or used for active agriculture. The proposed project would involve the construction and operation of a 39,098 gross square foot building that would be 35 feet in height and include lower and upper division teaching labs, interdisciplinary lecture space, faculty/administrative offices, research and research services space, conference rooms and mechanical, electrical and telecom support spaces. The proposed project site is approximately 1.5-acres in size (63,000 square feet [sf]) and is located northeast of existing campus Building 101, and the associated parking lot. Project construction staging areas would occupy approximately 52,000 sf in the area of campus located southeast of the site and north of SR 78 (Figure 2, Project Area Map).

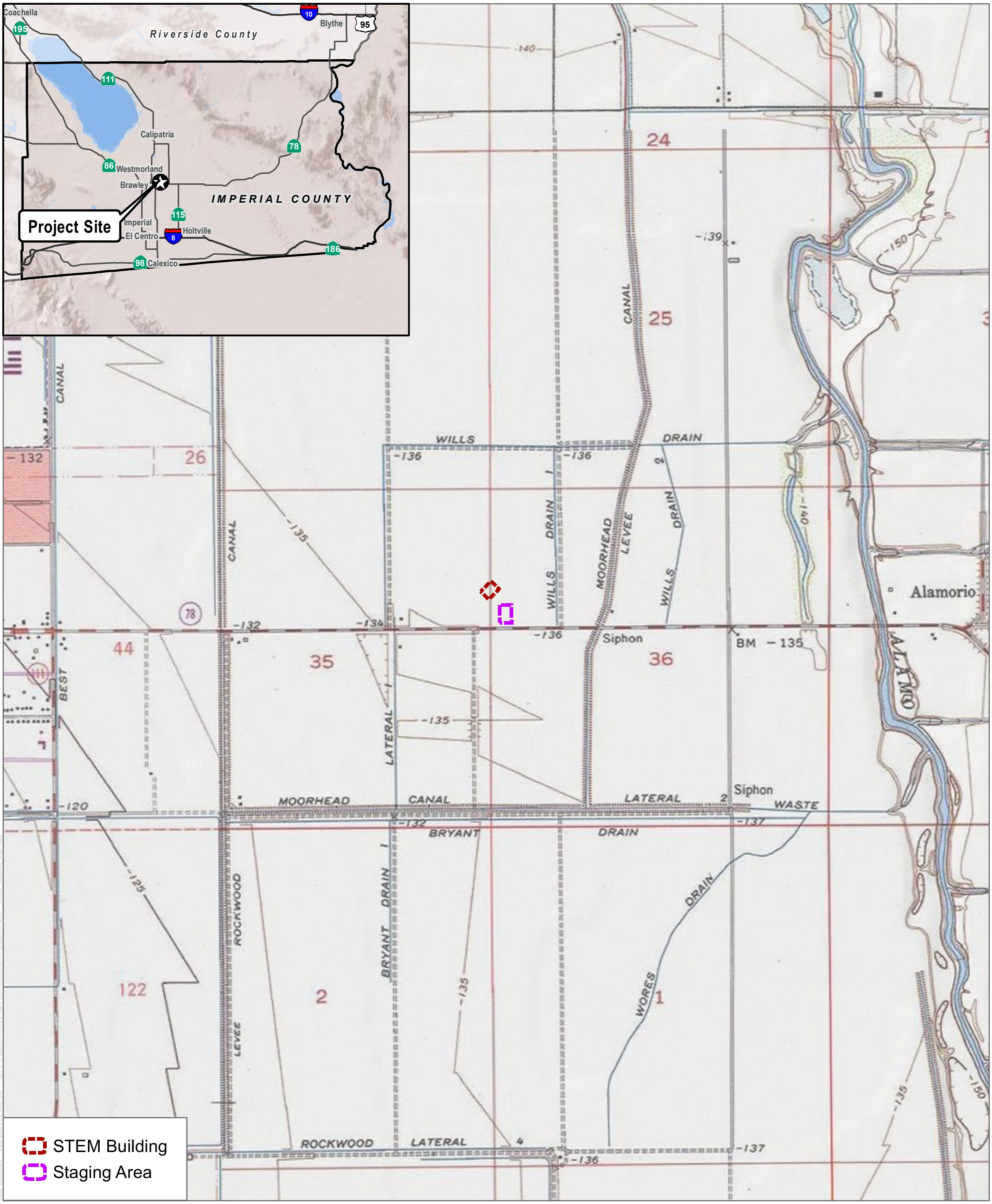
If you have any comments or concerns regarding tribal cultural resources (as defined in California Public Resources Code section 21074) in relation to the proposed project, please provide a written request for consultation via email to ascheidlinger@sdsu.edu or via hard copy mail to attention of: Amanda Scheidlinger, Director of Construction, San Diego State University, 5500 Campanile Drive, San Diego, CA 92182-1624. The California Native American tribe has within **30 days** of receipt of this notice to request consultation pursuant to California Public Resources Code section 21080.3.1. Please include the name of a

Planning, Design and Construction
Business and Financial Affairs
5500 Campanile Drive
San Diego CA 92182 · 1624
Tel: 619 · 594 · 5224
Fax: 619 · 594 · 4500

designated lead contact person. If you have any questions, please don't hesitate to contact Amanda Scheidlinger at ascheidlinger@sdsu.edu.

Sincerely,

____
Amanda Scheidlinger, Director of Construction
Att: Figure 1. Project Location Map
Figure 2. Project Area Map

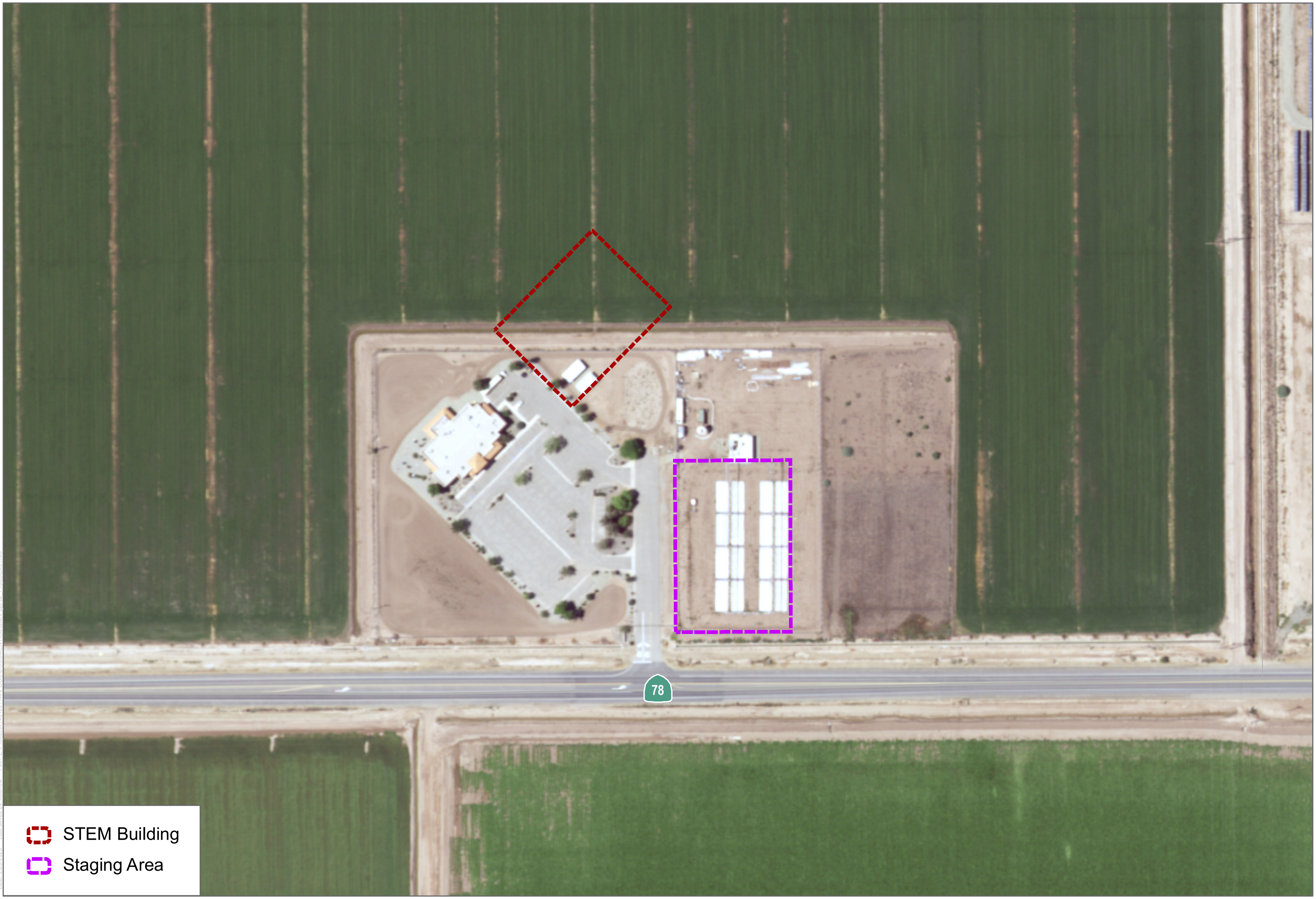


SOURCE: USGS 7.5-Minute Series Alamorio, Quadrangles
Township 13S; Range 14E; Sections 35, 36

DUDEK

0 1,000 2,000 Feet
0 285 570 Meters
1:24,000

FIGURE 1
Project Location
SDSU Brawley STEM Facility Project



SOURCE: NAIP 2020

DUDEK

0 80 160 Feet

FIGURE 2

Project Area

SDSU Brawley STEM Facility Project

Attachment F
Assembly Bill 52 Meeting Minutes

Brawley Sciences Building
Tribal Consultation - San Pasqual Tribe
7/31/2023 at 11:00am
Meeting Location: Zoom

Attendees:

- **BS** - Bob Schulz (SDSU)
- **AA** - Amanda Alpiner (SDSU)
- **KM** - Keshia Montifolca (Dudek)
- **AG** - Angelina Gutierrez (San Pasqual Tribe), Tribal Historic Preservation Office, Monitor Supervisor, San Pasqual Band of Mission Indians
- **JF** - John Flores (San Pasqual Tribe), Director, Environmental Department & Water Manager, San Pasqual Domestic Water Authority (SPDWA)

Meeting Minutes:

1. Introductions were made.
2. It was noted by BS that the draft cultural resources analysis was previously sent via email.
3. BS walked through Brawley Sciences Building presentation to give context to the project.
    a. The Brawley Sciences Building will be the first building constructed at the SDSU Brawley campus since the Initial Building was constructed 23 years ago.
    b. The project will be a sciences and engineering lab.
    c. The project site will be located just east of the City of Brawley at the SDSU Imperial Valley, Brawley campus, northeast of the existing building.
    d. Reviewed SDSU Brawley campus master plan and existing building location for reference.
    e. The building will be a Sciences, Technology, Engineering, and Math (STEM) innovation hub, funded by earmark funding from the State of California for investment in the Lithium Valley and renewable energy industry. The project will add instructional capacity to the Imperial Valley campus and provide space for future academic programs. The building will include research labs that will allow for partnerships with corporate interests in Imperial Valley for the study and advancement of renewable energy resources.
    f. The building program was reviewed. It will be primarily a laboratory and research building, with several teaching labs, which are not currently widely available for SDSU Imperial Valley students. The building will also house support spaces, gathering spaces, and offices for Principal Investigators (PIs) and research faculty supporting the program. There will not be any lecture classrooms in the building.
    g. Special attention has been paid to the extreme climate, and the building has been designed as an energy efficient facility.
    h. All of the parking is existing, and the existing building will not be changed as part of this project.

i. The project will be a simple two-story building with enough landscape to support the building, including fire truck access on 3.5 sides of the building. The east side drive lane will allow access for delivery trucks to maintain the propane tank for lab use, trash pickup, and fire truck access.
j. The building will feature a courtyard with a solar photovoltaic panel covered canopy.
k. The building layout was reviewed.
    i. The first floor will be for teaching labs and associated support spaces, student and faculty collaboration spaces, and offices.
        1. The Nursing program will go into the building in the dry engineering lab.
    ii. The second floor will be for research labs for future PIs for the university as well as corporate partnerships to support research in lithium extraction and the renewable energy industries in the Imperial Valley. There will also be research support spaces, collaboration spaces, and offices.
l. Existing and proposed site images were shown, with views from the existing parking area showing a model of the new building, as well as the view from the existing building connection.
m. This building will be the first multistory building for SDSU in Imperial Valley.
n. The building will be powered by electricity, and natural gas will only be used for lab use. The building will be heated and cooled through heat pumps.
o. The project will achieve a minimum LEED Silver certification, exceed Title 24 by 10% and meet CalGreen requirements.
p. Construction will start by early next year and occupy by Fall 2025.

4. KM reviewed Dudek's Draft Cultural Resources Technical Memo. A records search summary was performed and no resources were previously reported in the project area. Three cultural resources were located within one mile of the project, including one ranch and two isolates. The project site consists of agricultural land to the north of the site and the proposed staging area site has already been disturbed with shallow depressions by an existing research project. There will not be any further ground disturbance at the staging area. Intact surface deposits were disturbed from existing activity, but are negative from an archaeological perspective.

<u>Questions</u>:
AG: Was this site previously monitored by any tribes when the existing building was first constructed?
BS: There is no record of any monitoring occurring in the CEQA action when the original campus master plan was completed.

JF: Request was made to monitor construction activities during groundwork and earth disturbance when it occurs.
BS: Confirmed that this would be accommodated and requested that more than one tribe representative be available for monitoring in case one representative isn't available so as not to delay construction activities. The project will also have an archaeologist on site to monitor

ground disturbing activities. It was noted that the project may need to dig about five feet down for better soil conditions.
JF noted that there are several monitors on staff so this would not be a problem and the tribe can provide monitoring services from more than one individual, if needed. JF also noted that there may be activity on the site since it is located near the Salton Sea, where people have gathered in the past.

JF: No other questions or comments.

AG: Have any other tribes reached out for consultation regarding this project? San Pasqual Tribe has worked on many projects in the Imperial Valley and can provide many monitors.
BS: The Sycuan Tribe has requested consultation and the meeting with their representatives will be rescheduled this week.

BS: Sundt, the builder, will put together a schedule of the grading activities for a draft monitoring plan and SDSU will review with the tribes to plan for monitoring activities. Which tribe will provide monitors?
AG: Whichever tribe requests to be present will monitor ground disturbing activities. It will depend on the size of the project and how many monitors are needed. San Pasqual Tribe can rotate with the other tribes as well.

AG: No other questions or comments.

Attachments:
1. SDSU Brawley Sciences + Engineering Building project presentation
2. Draft Cultural Resources Technical Memo (Dudek)

Brawley Sciences Building
Tribal Consultation – Sycuan Tribe
8/4/2023 at 10:00am
Meeting Location: Zoom

Attendees:

- **BS** - Bob Schulz (SDSU)
- **NS** - Natalie Stenger (OCMI)
- **KM** - Keshia Montifolca (Dudek)
- **BP** - Bernice Paipa – Cultural Resources Specialist for the Kumeyaay Nation

Meeting Minutes:

1. Introductions were made.
2. BS walked through the Brawley Sciences Building presentation to give context to the project.
    a. The State of California is investing $80 million in Imperial Valley for this project, which is located on the SDSU Imperial Valley, Brawley campus, for investment in the Lithium Valley and renewable energy industry.
    b. The project will consist of a new standalone building located northeast of the existing SDSU building on the site and near the existing parking. The remainder of the site is largely undeveloped and consists of agricultural land and a solar voltaic farm.
    c. The current master plan of the campus site was reviewed with the existing and proposed buildings pointed out as reference.
    d. The building will be a Sciences, Technology, Engineering, Math, and Nursing innovation hub. The building will include research labs that will allow for partnerships with corporate interests in Imperial Valley for the study and advancement of renewable energy resources.
    e. The building program was reviewed. It will be primarily a laboratory and research building, with several teaching labs. The building will also house support spaces, gathering spaces, and offices for Principal Investigators (PIs) and research faculty supporting the program. There will not be any lecture classrooms in the building.
    f. Community space was noted as being an important element in the building. Outdoor gathering space and open space in the building for science fairs, etc. have been identified.
    g. Special attention has been paid to the extreme climate, and the building has been designed as an energy efficient facility, with attention to prevailing winds helping to drive the site.
    h. All of the parking is existing, and the existing building will not be changed as part of the project.
    i. The project will be a two-story building with enough landscape to support the building. The landscape should not have a large impact in modifying the land, as it should not involve deep grading.
    j. The building layout was reviewed.

    i. The first floor will be for teaching labs and associate support spaces, student and faculty collaboration spaces, and offices.
    ii. The second floor will be for research labs for future PIs for the university as well as corporate partnerships to support research in lithium extraction and the renewable energy industries in the Imperial Valley. There will also be research support spaces, collaboration spaces, and offices.

k. Existing and proposed site images were shown, with views from the existing parking area showing a model of the new building, as well as the view from the existing building connection.
l. The building will be powered by electricity, and natural gas will only be used for lab use.
m. The building will be sustainable, achieving a minimum LEED Silver certification, exceed Title 24 by 10% and meet CalGreen requirements.
n. Construction will start by December 2023-January 2024 and the building is planned to be occupied by Fall 2025.
o. KM reviewed Dudek's Draft Cultural Resources Technical Memo. A records search summary was performed and no resources were previously reported in the project area. However, three cultural resources were located within one mile of the project, which included one ranch and two isolates. The northern half of the project area is agricultural land, while a portion of the southern half is planned for construction. The area planned for construction includes the following two sites:
    i. The proposed building site
    ii. The proposed staging area
        1. This area has already been disturbed with shallow depressions by an existing research project. There will not be any further ground disturbance at the staging area. Intact surface deposits were disturbed from existing activity, but are negative from an archaeological perspective.
p. BS explained that the existing irrigation on the agricultural site requires drainage underneath the plants as well, meaning the ground has previously been touched beyond just the immediate surface when it was turned into an agricultural site, which happened multiple decades before SDSU began building on the site.
q. BS explained that San Pasqual has also expressed interest in monitoring the project site during site digging and construction. There are many tribal monitoring entities in the area, and multiple will need to be identified so that backups can be contacted for site monitoring if needed.

<u>Questions:</u>

BP: Have any artifacts found on the site during past projects?
BS: Not to our knowledge. There were no strict records taken regarding artifacts for past projects, but nothing has suggested anything being found on the site.

BP: Can I go on a site visit? A site visit will help visualize what could have been located on the site in the past.

BS: Yes. Maribel Madero can help set this up. If the visit is done by September then your notes and comments from it can be included when submitting EIR items for the project.

BP: What is the timeline for starting construction on the site?
BS: Construction on the site should start around mid-December 2023.

BP: Was a tribal monitor used when surveying the site?
KM: No, a tribal monitor was not used in the records survey.

BP: Were both sites surveyed (construction site and staging site)?
KM: Yes, both sites were surveyed.

Appendix E
Geology and Soils Technical Memorandum

MEMORANDUM

To:	Michael Haberkorn, Gatzke Dillon & Ballance
From:	Perry Russell, Dudek
Subject:	SDSU Brawley Sciences Building Project Technical Memo – Geology and Soils
Date:	August 16, 2023
cc:	Sarah Lozano, Kirsten Burrowes, Dudek
Attachments:	A – Figures B – Geotechnical Report

Dudek has conducted an evaluation pursuant to the requirements of the California Environmental Quality Act (CEQA), California Public Resources Code 21000, et seq., to determine the presence and potential impacts related to geology and soils associated with the proposed San Diego State University (SDSU) Imperial Valley Campus Brawley Sciences Building Project (project or proposed project), located east of Brawley, California. This technical memorandum provides the results of the geology and soils investigation.

1 Project Location and Setting

The project is located at 560 California State Route (SR) 78 (also referred to as Ben Hulse Highway) in Imperial County, east of the city of Brawley. Regional access to the campus is provided by SR 111 and SR 86 to the west and northwest, respectively, and SR 115 to the east (See Attachment A: Figure 1). The proposed project site is surrounded by agricultural uses to the north, south, and west. Undeveloped land and a solar farm are located directly east of the proposed project site. The proposed Science Building would be constructed northeast of existing campus Building 101, and the associated parking lot. Project construction staging areas would occupy the area of campus located southeast of the site and north of SR 78 (See Attachment A: Figure 2).

2 Project Description

In September 2003, CSU certified an environmental impact report and approved a Campus Master Plan for development of the SDSU Brawley Campus (Brawley Campus or campus), which would serve as an extension of the existing SDSU Imperial Valley Campus (IVC) located in Imperial County. The IVC is an extension of SDSU's main campus located in San Diego and furthers the university's regional educational mission to provide additional educational opportunities to the outlying communities of Imperial County. The approved Campus Master Plan and certified environmental impact report (EIR) provided sufficient environmental analysis and authorization necessary for enrollment of up to 850 full-time equivalent (FTE) students and corresponding faculty and staff, and a framework for development of the facilities necessary to serve the approved campus enrollment.

The Brawley Campus is approximately 200 acres in size and is located east of the city of Brawley (city). Currently, the Campus has been partially built out with educational and support facilities, although much of the campus remains undeveloped or used for active agriculture. As noted above, the environmental impacts associated with development of the Brawley Campus, including a student enrollment up to 850 FTE, were evaluated at a program level of review in the previously certified 2003 SDSU Imperial Valley Campus Master Plan Project EIR (2003 EIR) (SCH 200251010). In CSU's effort to build out the IVC consistent with the previously approved Campus Master Plan, SDSU now proposes construction and operation of a sciences research and instruction facility that would be located on the Brawley Campus.

The proposed project involves the construction and operation of a STEM building (science, technology, engineering, and mathematics) that would house teaching labs, lecture spaces, faculty/administration offices, research spaces, and conference rooms, as well as mechanical, electrical, and telecom support spaces. The proposed project does not include/propose any increase in the previously authorized and approved maximum student enrollment of 850 FTE.

The proposed project site is approximately 3.2-acres in size and the construction staging areas would occupy approximately 1-acre in the area of campus located southeast of the site and north of SR 78. The project includes 61,119 sf of on-site landscaping, including the construction of bio-retention areas to capture stormwater runoff from stormwater drainages systems that will be located throughout the project site. Hardscape improvements will include 41,297 sf of sidewalks and pedestrian walkways, which will connect the project site to existing campus buildings and parking lot.

Additionally, the project will require new points of connection to domestic water, fire water, and sewer lines from existing utility lines to serve the new building, as well as new domestic water line infrastructure. Potable water will be provided by the city of Brawley, as well as sewer and wastewater collection services. New utility infrastructure will also be required to support electrical services for the building, as well as a back-up diesel operated generator.

The proposed project building would have an area of 36,900 gross sf and would be approximately 35 feet in height. The project is projected to be built over the course of 19 months, with construction estimated to begin in January 2024.Construction and equipment staging would require 1 acre of space within the campus, directly east of the existing building (Building 101) and parking lot. The project would involve site preparation, grading, and excavation associated with project construction. Excavation depths are anticipated to be 2 to 5 feet. Waste (i.e., excavated gravel/soil) generated during project construction would be balanced within the site.

3 Analysis Methodology

The analysis presented here considers the potential environmental impacts of the proposed project relative to existing conditions. Establishment of the project site's existing geology and soils conditions has been prepared using information contained in the previously certified 2003 SDSU Imperial Valley Campus Master Plan Project EIR (SDSU 2003), combined with updated information, as applicable from the California Geological Survey (CGS), Southern California Earthquake Data Center, U.S. Geological Survey (USGS), Imperial County General Plan (Seismic and Public Safety Element), and Imperial County General Plan EIR. In addition, the results of a March 2023, project-specific geotechnical report, by Group Delta (Attachment B, Geotechnical Report), have been incorporated into the existing conditions section and impact analysis.

4 Geology and Soils

4.1 Existing Conditions

Regional Geology

The Brawley Campus lies within the Salton Trough, the dominant landform within Imperial County. The Salton Trough encompasses the Coachella, Imperial, and Mexicali valleys and extends north from the Gulf of California. The lowest part of the basin is the bed of the prehistoric Lake Cahuilla, with its ancient beach line at about 35 feet above mean sea level. The deepest portion is covered by the Salton Sea with a water surface level measured at 226 feet below mean sea level at its highest level in April 1986. The geologic structure of the trough is a result of an evolving "rift" in the earth's crustal plates. As the crust thins due to the "spreading" of the trough, magma rises closer to the surface, heating deep groundwater. Nonmarine and alluvium sediments cover large portions of the area. An unexposed succession of Tertiary- and Quaternary-age sedimentary rocks lies below the alluvial and lake bottom sediments, ranging in depth from 11,000 feet or greater at the margins to over 20,000 feet in the central portions of the Salton Trough. The valley is drained by an 8,360 square mile watershed, which eventually empties into the Salton Sea (SDSU 2003).

Soils

Soils in the Brawley Campus area consist of over 100 feet of late Pleistocene to Holocene lacustrine (i.e., lake) deposits associated with ancient Lake Cahuilla, overlain by shallow fill. Borings drilled on-site indicated the site is underlain by 1 to 2 feet of fill material, consisting of fat clay. Laboratory testing of these surficial clays indicate these soils have a high to very high expansion potential and range in consistency from soft to stiff. The underlying lacustrine sediments are typically unconsolidated to poorly consolidated and porous, consisting generally of clay, silt, and silty sand. Borings drilled on-site, to a maximum depth of 88.5 feet, encountered several approximate 2- to 3-foot thick beds of silty sand between depths of 18 to 28 feet below ground surface (bgs). An additional approximate 10-foot thick layer of medium dense to dense, sandy materials was also encountered at depths of 50 to 60 feet bgs (Appendix A).

The artificial fill material is derived from native surficial soils. Between one half and two thirds of the Brawley Campus is covered by soils generally identified as Imperial, described as nearly level, moderately well drained, silty clay in lacustrine basins. Imperial-Glenbar occurs over the remainder of the site. This soil type refers to nearly level, moderately slow draining silty clay loams in the lacustrine basin (SDSU 2003).

Faulting and Seismicity

Surface fault rupture is the displacement of ground surface that occurs along a fault line during an earthquake event. Based on criteria established by the CGS, faults are classified as either Holocene-active, pre-Holocene, or age-undetermined. Faults are considered active when they have shown evidence of movement within the past 11,700 years (i.e., Holocene epoch). Pre-Holocene faults, also known as potentially active faults, are those that have shown evidence of movement more than 11,700 years ago and generally before 1.6 million years (Quaternary age). Faults whose age of most recent movement is not known or is unconstrained by dating methods or by limitations in stratigraphic resolution are considered age-undetermined and inactive (CGS 2018).

The Alquist-Priolo Earthquake Fault Zoning Act (formerly known as the Alquist-Priolo Special Studies Zones Act) established state policy to identify active faults and determine a boundary zone on either side of a known fault trace, called the Alquist-Priolo Earthquake Fault Zone. The delineated width of an Alquist-Priolo Earthquake Fault is based on the location, precision, complexity, or regional significance of the fault and can be between 200 and 500 feet in width on either side of the fault trace. If a site lies within a designated Alquist-Priolo Earthquake Fault Zone, a geologic fault rupture investigation must be performed to demonstrate that a proposed building site is not threatened by surface displacement from the fault, before development permits may be issued (CGS 2018).

The Imperial Valley area is subjected to frequent seismic events, with related concerns of ground shaking and liquefaction. The most noteworthy of the numerous faults traversing the Salton Trough is the Holocene-active Coachella section of the San Andreas Fault. Two other major northwest-trending Holocene-active fault zones bounding the Salton Trough include the San Jacinto Fault on the northwest and the Elsinore Fault on the southwest (Figure 3, Regional Faulting). The potential for future large earthquakes on the San Andreas and San Jacinto fault zones is based on potential rupture scenarios associated with both fault zones, as movement on the San Jacinto Fault is dependent on movement of the southern San Andreas Fault Zone. Based on historic and pre-historic fault ruptures, the maximum worst-case earthquake on these two interrelated fault zones would be moment magnitude (Mw) 8.0. However, the probable maximum magnitude of is Mw 6.5 to Mw 7.5 for the San Jacinto Fault and Mw 6.8 to Mw 8.0 for the San Andreas Fault (Sanders 1993, USGS 2002, Scharer and Yule 2020, SCEDC 2023).

The Holocene-active Imperial and Brawley faults are the closest faults to the Brawley Campus. Recent studies indicate that these two faults are interrelated. As illustrated in Figure 3, the northern terminus of the Brawley Fault is approximately 2 miles south of the Brawley Campus and the northern terminus of the Imperial Fault is approximately 3.5 miles southwest of the campus (CGS 2023a). The Brawley Campus is not located in an Alquist-Priolo Earthquake Fault Zone associated with the Brawley or Imperial faults (CDMG 1990). The Imperial Fault Zone is the principal element of the San Andreas Fault System within the Salton Trough. Ground surface rupture has occurred twice during historic times, including 1940 and 1979 (and possibly in 1915), as evidence by offset of historic alluvium, lacustrine deposits, and cultural features. The 1940 earthquake produced surface rupture offsets up to 23 feet near the U.S.-Mexico border. Data from these earthquake events suggest a slip rate of 15 to 20 millimeters/year for the Holocene epoch (past 11,700 years). As discussed below, slip is transferred north through the Brawley Seismic Zone, and some slip may be transferred to the San Jacinto Fault Zone. The recurrence interval is 30 to 40 years for a 1979-style earthquake event and 270 to 700 years for a 1940-style earthquake. Others have postulated recurrence intervals of 40 years, 137 years, and 37 years, respectively, for the northern, central, and southern segments of the fault. In addition, the maximum probable earthquake magnitude for the Imperial Fault is Mw 6.5 to Mw 7.0 (Treiman 1999, SCEDC 2022, USGS 2022).

As illustrated in Figure 3, the Brawley Seismic Zone extends southeast 30 kilometers across the Salton Trough, from the southern-most tip of the San Andreas Fault to the Imperial Fault in the south. This seismic zone accommodates continental plate motion and rifting along the Pacific-North American plate boundary, at rates up to 17 millimeters per year, transferring slip from the San Andreas Fault to the Imperial Fault. The southern segment of the Brawley Seismic Zone is located approximately 3 miles west of the Brawley Campus. Seismicity along this seismic zone consists mostly of short-duration earthquake sequences of up to 10 days duration, and consist of foreshocks, mainshocks, and aftershocks. Approximately 4 to 6 kilometers of right lateral offset along the seismic zone and the presence of volcanic buttes reflect rift tectonics of crustal thinning, as well as recent volcanics at the south shore of the Salton Sea (Hauksson et al. 2021, USGS 2002).

The largest recorded earthquake in Imperial County occurred on the Imperial Fault in May 1940. This Richter magnitude 7.1 earthquake was centered on the international border, east of Calexico, and could be traced for approximately 50 miles, from the Volcano Lake in Mexico, north through the Imperial Valley, just north of Brawley. The newly completed All-American Canal was offset approximately 14 feet by movement on the fault and nine people died from the earthquake. In addition, a magnitude 6.6 earthquake occurred along the Imperial Fault in October 1979. The epicenter was 7 miles east of Calexico. No lives were lost but numerous structures and canals were damaged, including settlement of the All-American Canal up to 4 feet. Earthquake damage was estimated at $30 million. In addition, a magnitude 7.2 earthquake occurred near Calexico in April 2010.

Other substantial earthquakes in Imperial County include those occurring in 1892 (M7.1), 1915 (M6.3 and 7.1), 1930 (M5.7), 1950 (M5.4), 1957 (M5.2), 1968 (M6.5), 1980 (M6.1), 1981 (M5.8), 1987 (M6.2 and 6.8), and 2010 (M7.2). In addition to the faults described above, other active faults in the region include the Superstition Hills, Superstition Mountain, Laguna Salada, and Cerro Prieto faults. Currently, portions of the County are effected by a minor earthquake with a magnitude of 4.5 or less every few months. The County may experience an earthquake with a magnitude of 5.5 or greater every five years and dozens of micro-seismic events, with magnitudes of 2.0 or less, on a daily basis (CGS 2019, Imperial County Planning and Development Services 1993a, USGS 2011b, Attachment B). Based on the project-specific geotechnical report (Attachment B), the estimated peak ground acceleration at the site, associated with a Mw 6.7 earthquake, is 0.6g (percent of gravity).

Fluid injection and geothermal energy extraction in the North Brawley Geothermal Field, located within the Brawley Seismic Zone, have been linked to seismic hazards. After a few years of geothermal operations at the North Brawley Geothermal Field, located within the Brawley Seismic Zone, several magnitude 4 to 5 earthquakes occurred in 2012, followed by a long period of few earthquakes. Ground deformation was analyzed in the area, combining radar images, GPS, and leveling to reveal how the ground moved before, during, and after the 2012 events, with centimeter-scale accuracy (Materna et al. 2022). Another potential source of concern in geothermal fields is faults that slip without generating seismic waves. Silent slip, or fault creep, may play a role in controlling the location and duration of earthquake swarms. The processes behind silent or aseismic slip at geothermal fields are not well understood, largely because they are difficult to measure (Materna et al. 2022).

Liquefaction and Lateral Spreading

Liquefaction involves a sudden loss in strength of saturated, cohesionless soils that are subject to ground shaking during an earthquake and results in temporary transformation of the soil to behave more like a fluid mass. For liquefaction to occur, three conditions are required: (1) ground shaking of sufficient magnitude and duration; (2) a groundwater level at or above the level of susceptible soils during the ground shaking (i.e., generally at depths less than 40 feet); and (3) soils that are susceptible to liquefaction. Similarly, lateral spreading can result in ground cracking and may occur when a site is sloped or near a free-face and there is a sufficiently continuous liquefiable layer on which the overlying soils can move laterally. Ground settlement may occur during seismic shaking as a result of liquefaction.

The Brawley Campus has not been included in regional liquefaction analyses by the CGS (2023b). However, the unconsolidated sediments of the Salton Trough, especially in saturated areas such as irrigated lands, are subject to failure during earthquakes as a result of liquefaction (Imperial County Planning and Development Services 1993a). Liquefaction caused by the M7.2 El Mayor-Cucapah earthquake was widespread throughout the southern Imperial Valley. Ground motions of 0.3g to 0.6g (percent of gravity) were recorded in the majority of liquefaction areas (USGS 2011).

Groundwater was encountered in on-site borings at depths of 8 to 12 feet bgs. As previously discussed, borings drilled on-site encountered several approximate 2- to 3-foot thick beds of silty sand between depths of 18 to 28 feet bgs, as well as an additional approximate 10-foot thick layer of medium dense to dense, sandy materials at depths of 50 to 60 feet bgs. Geotechnical analyses indicated that these sandy layers are potentially liquefiable under high seismic loads. Liquefaction induced differential settlement and seismic compaction, which is the densification of loose to medium dense granular soils that are above groundwater, are likely to occur in the event of a large earthquake at the site. The estimated liquefaction-induced differential settlement is approximately 0.5 inch or less over a horizontal distance of 30 feet. Since the project site is relatively flat, the potential for substantial liquefaction-induced lateral displacement is low (Attachment B).

Subsidence

Subsidence is the permanent collapse of the pore space within a soil or rock and downward settling of the earth's surface relative to its surrounding area. Subsidence can result from the extraction of water, oil, or geothermal resources, and the addition of water to the land surface—a condition called "hydrocompaction," or peat loss. The compaction of subsurface sediment caused by the withdrawal or addition of fluids can cause subsidence. Land subsidence can disrupt surface drainage; reduce aquifer storage; cause earth fissures; damage buildings and structures; and damage wells, roads, and utility infrastructure.

According to the USGS Survey Areas of Land Subsidence in California map, there have been no recorded instances of subsidence in the Brawley Campus area associated with groundwater pumping, peat loss, or oil extraction (USGS 2023). However, natural subsidence has been occurring within the Salton Trough, averaging nearly two inches per year at the center of the Salton Sea, and decreasing to zero near the Mexican border. The subsidence is generally uniform, but local depressions have formed, such as the Mesquite Sink, located along Highway 86, between Imperial and Brawley.

In addition, subsidence in geothermal fields can occur when large fluid volume production leads to the decrease of pore pressure inside reservoirs. This decline disturbs the pressure stability and overburden pressure compresses the pores, resulting in a drop in the ground surface. The decrease in ground surface elevation can not only result in damage to buildings, pipelines, and canals, but may interrupt the balance in the nearby ecosystem (Sektiawan et al. 2016). Significant ground movement, in the form of ground subsidence and horizontal movement, may accompany geothermal development in the Imperial Valley. Regional and local survey nets are being monitored to detect and measure possible ground movement caused by future geothermal developments. Precise measurement of surface and subsurface changes are required to differentiate man-induced changes from natural processes (USGS 2013). Two geothermal facilities are located approximately 3 miles and 4 miles northwest of the Brawley Campus (Imperial County Planning and Development 2013).

Satellite radar interferometry (InSAR) was applied to detect surface deformation associated with geothermal development and concluded that distinct areas of subsidence are present in three geothermal fields in the Imperial Valley, including the Salton Sea, Heber, and East Mesa geothermal fields. In addition, ground uplift was observed at the Heber geothermal field (Eneva et al. 2012). These geothermal fields are located approximately 15 miles northwest, 19 miles south, and 18 miles southeast of the Brawley Campus, respectively (Imperial County Planning and Development 2013).

Land subsidence can be avoided by re-injecting all production water back into the aquifer it was withdrawn from so that pressure changes are minimized. Subsidence can be reduced through monitoring combined with aquifer management. Aquifers must be managed to balance groundwater recharge and groundwater discharge at both local and basin-wide scales. Management tools include 1) ensuring all water used for geothermal heat extraction is pumped back into the aquifer, 2) replacing water lost from the aquifer by increasing groundwater recharge to the basin-fill aquifer through conjunctive management of groundwater and surface water resources, and importation of water from other basins, 3) dispersing high-discharge wells to reduce localized land subsidence, and 4) reducing overall groundwater withdrawals in the basin (USGS 2012). In addition, well field programs covering production and injection plans in Imperial County are required by the Bureau of Land Management and CalGEM for each major geothermal project and are subject to review by CalGEM and the County (Imperial County Planning and Development Services 1993b).

Slope Stability

The topography of the Brawley Campus is relatively flat to gently sloping; therefore, there is no potential for slope instability such as landslides to occur.

5 Impact Analysis and Conclusions

5.1 Thresholds of Significance

The thresholds of significance used to evaluate the impacts of the proposed project related to geology and soils are based on Appendix G of the CEQA Guidelines (Cal. Code Regs., Title 14, Chptr. 3, sections 15000-15387.). A significant impact under CEQA would occur if the proposed project would:

a) Directly or indirectly cause potential substantial adverse effects, including the risk of loss, injury, or death involving:
   i. Rupture of a known earthquake fault, as delineated on the most recent Alquist-Priolo Earthquake Fault Zoning Map issued by the State Geologist for the area or based on other substantial evidence of a known fault?
   ii. Strong seismic ground shaking?
   iii. Seismic-related ground failure, including liquefaction?
   iv. Landslides?
b) Result in substantial soil erosion or the loss of topsoil?
c) Be located on a geologic unit or soil that is unstable, or that would become unstable as a result of the project, and potentially result in on- or off-site landslide, lateral spreading, subsidence, liquefaction, or collapse?
d) Be located on expansive soil, as defined in the 2022 California Building Code, creating substantial direct or indirect risks to life or property?
e) Have soils incapable of adequately supporting the use of septic tanks or alternative waste water disposal systems where sewers are not available for the disposal of waste water?

5.2 Impact Analysis

a) Would the project directly or indirectly cause potential substantial adverse effects, including the risk of loss, injury, or death involving:

i. Rupture of a known earthquake fault, as delineated on the most recent Alquist-Priolo Earthquake Fault Zoning Map issued by the State Geologist for the area or based on other substantial evidence of a known fault?

Impacts related to rupture of a known earthquake fault were evaluated in Section 3.2, Geology/Soils, of the 2003 EIR, which concluded that the Brawley Campus is not within the limits of the Alquist-Priolo Special Studies Zones of the Imperial and Brawley faults. Accordingly, the 2003 EIR did not provide an impact conclusion regarding potential rupture of a known earthquake fault.

The proposed project involves construction and operation of a new campus building within the footprint of Building 107, as identified in the approved Campus Master Plan and analyzed in the previously certified 2003 EIR. As discussed above, the Holocene-active Imperial and Brawley faults are the closest faults to the Brawley Campus. As illustrated in Figure 3, the northern terminus of the Brawley Fault is approximately 2 miles south of the Brawley Campus and the northern terminus of the Imperial Fault is approximately 3.5 miles southwest of the campus. The Brawley Campus is not located in an Alquist-Priolo Earthquake Fault Zone associated with either of these faults. No new information or substantial changes in circumstances have occurred requiring new or additional analysis with regard to rupture of a known earthquake fault at the project site. As a result, surface fault rupture is not anticipated at the project site and the project would not directly or indirectly cause potential substantial adverse effects involving the rupture of a known earthquake fault. **No impact** would occur.

ii. Strong seismic ground shaking, or

iii. Seismic-related ground failure, including liquefaction?

Impacts related to seismic ground shaking, seismic related ground failure, and liquefaction were evaluated in Section 3.2, Geology/Soils, of the 2003 EIR, which concluded that although no geotechnical conditions have been identified to preclude development of the IVC Brawley projects as planned, geology/soils impacts would be significant because of the hazards from seismic activity if proper construction techniques are not observed at the detailed design and construction stages. Mitigation measures were provided that require SDSU to 1) avoid adverse discontinuities in strength between major structural elements, 2) prior to detailed site planning, conduct a subsurface geotechnical and soils study to ensure structural integrity, and 3) adhere to recommendations of the geotechnical and soils study in developing grading and construction plans (Mitigation Monitoring and Reporting Program [MMRP] page 11-1)[1]. With implementation of the mitigation measures, impacts were determined to be less than significant.

[1] 3.2 Geology and Soils Mitigation Measures included on page 11-1 of the 2003 EIR: (1) Adverse discontinuities in strength between major structural elements shall be avoided. (2) Prior to detailed site planning, a subsurface geotechnical and soils study shall be

Updated information since completion of the 2003 EIR related to seismicity, including liquefaction and fluid injection, are summarized below, as well as in Section 4.1, Existing Conditions. The Imperial Valley area is subjected to frequent seismic events, with related concerns of ground shaking and liquefaction. The most noteworthy of the numerous faults traversing the Salton Trough is the Holocene-active Coachella section of the San Andreas Fault. As described above in Section 4.1, Existing Conditions, two other major northwest-trending Holocene-active fault zones bounding the Salton Trough include the San Jacinto Fault on the northwest and the Elsinore Fault on the southwest (Figure 3). In addition, the Holocene-active Imperial and Brawley faults are located south of the Brawley Campus and the Brawley Seismic Zone is located approximately 3 miles west of the Brawley Campus. Fluid injection and geothermal energy extraction in the North Brawley Geothermal Field, located within the Brawley Seismic Zone, have been linked to seismic hazards.

The unconsolidated sediments of the Salton Trough, especially in saturated areas such as irrigated lands, are subject to failure during earthquakes as a result of liquefaction. As a result, the proposed project would potentially be subject to liquefaction in the event of a large earthquake. Seismic induced ground shaking can also result in differential settlement and seismic densification because of variations in soil composition, thickness, and initial density.

Since certification of the 2003 EIR, the CEQA significance criteria have been revised (per Appendix G of the 2022 CEQA Statute and Guidelines). Seismic impacts on any given project are no longer considered potentially significant. Rather, impacts would only be considered significant in the event the project directly or indirectly caused seismic impacts to occur. Because construction and operation of the proposed building would not induce seismicity, no impacts would occur.

Regardless, the following is an updated discussion of protocol that would be followed with respect to seismic engineering of the proposed building. As required by the 2022 California Building Code (CBC), the proposed Brawley Campus building and associated infrastructure improvements would be constructed in accordance with the recommendations of the project-specific geotechnical report (Attachment B), which includes recommendations for remedial grading and foundation design to address strong seismic ground shaking, liquefaction, differential settlement, and seismic densification. Accordingly, while referred to as “recommendations” in the referenced report, each recommendation is, in fact, required by law to be implemented. More specifically, the geotechnical report recommendations require the use of thickened and heavily reinforced conventional building foundations or post-tensioned slabs to reduce the potential for distress to the proposed building associated with post-liquefaction settlement. The geotechnical recommendations are consistent with *CGS Note 48, Checklist for the Review of Engineering Geology and Seismology Reports for California Public Schools, Hospitals, and Essential Services Buildings* (CGS 2022). Design and construction to these standards would provide an acceptable level of earthquake safety for students, employees, and the public who occupy the building, to the extent feasible.

In addition, the project would be designed in accordance with the CSU Seismic Requirements (CSU 2020), which include specific requirements for the construction of new buildings, to ensure that all

conducted to determine the shrink-swell potential and to develop design specific measures to ensure structural integrity. Grading and construction plans shall conform to recommendations of the study.

CSU buildings provide an acceptable level of earthquake safety for students, employees, and the public, per the CBC. The CSU Seismic Policy applies to all structures within the bounds of a CSU campus master plan. These seismic requirements set forth procedures to follow in order to manage current construction programs and limit future seismic risk to acceptable levels. CSU has established campus-specific seismic ground motions parameters that supersede CBC values and implement a conservative evaluation on CBC Structural Risk Category assignments.

The CSU Seismic Requirements require that all major capital building projects, such as the proposed project, be peer reviewed by the Division of State Architect (DSA), prior to and during construction. The DSA provides design and construction oversight for K–12 schools, community colleges, and various other state-owned and leased facilities. The DSA also develops accessibility, structural safety, fire and life safety, and historical building codes and standards utilized in various public and private buildings throughout California. This review process starts at project inception and continues until construction completion. Peer review concurrence letters are typically issued at completion of the Schematic and Construction Documents Phases and during the course of construction on deferred submittals that have a seismic component. Resolution of outstanding Seismic Review Board peer review comments is required before start of construction, and resolution of Seismic Review Board construction phase submittals is required prior to occupancy. In addition, the project would be submitted to the CSU Architecture and Engineering, Building Code Plan Check Review process. All approved plans for construction would include a stamp that verifies the design would be completed in compliance with appropriate CSU Seismic Requirements. The stamp would also indicate that the project has been reviewed consistent with Chapter 16 of the CBC and the State Earthquake Protection Law.

Furthermore, the CGS serves as an advisor under contract with the DSA to review engineering geology and seismology reports for compliance with state geologic hazard regulations. For all facility construction, SDSU will be required to send all engineering, geotechnical, and soils reports normally required to comply with the CBC to the CGS to ensure such reports also comply with applicable geologic hazard regulations (i.e., the Field Act and the Seismic Hazards Mapping Act). The CGS has outlined the required scope of geology, seismology, and geologic hazards evaluations under California Code of Regulations, Title 24. Among other things, the reports must be prepared by appropriately licensed professionals and must include adequate site characterization, estimates of earthquake ground motions, assessment of liquefaction/ settlement potential, slope stability analysis, identification of adverse soil conditions (e.g., expansive or corrosive soils), and mitigation recommendations for all identified issues. Final DSA approval of the proposed building will not occur unless DSA receives the final acceptance letter from CGS.

The proposed building and infrastructure improvements would be constructed under the supervision of a California Geotechnical Engineer and/or California Certified Engineering Geologist. In addition, construction and operation of proposed project facilities would not increase the potential for earthquakes or seismically induced ground failure to occur. As a result, the project would not directly or indirectly cause potential substantial adverse effects involving strong seismic ground shaking or seismic-related ground failure, including liquefaction. **No impacts** would occur.

iv. Landslides?

The Initial Study (IS) prepared for the 2003 EIR determined that no impact would occur with regard to landslides. The topography of the Brawley Campus and surrounding area is relatively flat to gently sloping. With implementation of the required recommendations provided in the project-specific geotechnical report, slope instability would not adversely impact the proposed development (Attachment B). In addition, because the topography of the site is relatively flat, grading and construction would not cause slope instability to occur. As a result, the project would not directly or indirectly cause potential substantial adverse effects involving landslides. **No impacts** would occur.

b) Would the project result in substantial soil erosion or the loss of topsoil?

The 2003 EIR and IS prepared for the 2003 EIR did not specifically address soil erosion and loss of topsoil. Therefore, a discussion regarding the proposed project's potential to result in substantial soil erosion or the loss of topsoil is provided below.

The proposed project site is approximately 1.5-acres in size and the construction staging areas would occupy approximately 52,000 sf in the area of campus located southeast of the site and north of SR 78. The project would involve site preparation, grading, and excavation associated with project construction. Excavation depths are anticipated to be 2 to 5 feet, followed by soil backfill and compaction. Project grading and construction would temporarily expose onsite soils to wind and water erosion, which in turn could result in sedimentation of downstream drainages. However, because project construction would involve ground disturbance in excess of 1 acre, grading and construction would be completed in accordance with the requirements outlined in the National Pollutant Discharge Elimination System (NPDES) Construction Stormwater General Permit (2009-0009-DWQ), effective July 1, 2010 (NPDES Construction General Permit), which includes the development of a Stormwater Pollution Prevention Plan (SWPPP). The SWPPP would identify potential water quality pollutants (including erosion-induced sedimentation), identify minimum best management practices (BMPs) to prevent offsite sedimentation, and develop a construction site monitoring plan for the project. After construction, the project site would be developed with impermeable surfaces and 21,760 sf of on-site landscaping, thus eliminating the potential for soil erosion. As a result, the Project would not result in substantial soil erosion or the loss of topsoil and impacts would be **less than significant.**

c) Would the project be located on a geologic unit or soil that is unstable, or that would become unstable as a result of the project, and potentially result in on- or off-site landslide, lateral spreading, subsidence, liquefaction, or collapse?

The IS completed for the 2003 EIR concluded that no impacts would occur with respect to potentially unstable geologic units, including landslides, lateral spreading, subsidence, liquefaction, and collapse. Since certification of the 2003 EIR, the CEQA significance criteria have been revised (per Appendix G of the 2022 CEQA Statute and Guidelines). Geologic hazard impacts on any given project are no longer considered potentially significant. Rather, impacts would only be considered significant in the event the project directly or indirectly caused geologic hazard impacts to occur. Therefore, the following is an updated discussion of potential impacts related to geologic hazards, as well as an updated discussion of protocol that would be followed with respect to geotechnical engineering of the proposed building. In addition, updated information since completion of the 2003 EIR related to liquefaction and subsidence are summarized below. New information pertaining to liquefaction and subsidence is also presented in Section 4.1, Existing Conditions.

As described for Thresholds a-ii and a-iii, although the project would be susceptible to strong seismically induced ground shaking and liquefaction, project design and construction would be completed in compliance with the 2022 CBC and CGS Note 48, pertaining to seismic design for California public schools. In compliance with the CBC, project design and construction would be completed in accordance with the recommendations of the project-specific geotechnical report (Attachment B). The proposed building would also be subject to review and plan approval by the DSA and the CSU Architecture and Engineering, Building Code Plan Check Review process, prior to and during construction. Compliance with the CBC, DSA review and approval, and CSU Architecture and Engineering review would help to offset potential risks to structures and people associated with liquefaction and collapsible soils. In addition, constructing the proposed building within a liquefaction-prone area would not, in and of itself, increase liquefaction risks to surrounding uses. Although the project site is potentially susceptible to liquefaction, no slopes are present on the site, thus eliminating the potential for lateral spreading to occur (Attachment B). As described for Threshold a-iv, the project would not be susceptible to landslides.

Natural subsidence has been occurring within the Salton Trough, averaging nearly two inches per year at the center of the Salton Sea, and decreasing to zero near the Mexican border. This natural subsidence is relatively uniform over large areas. In addition, subsidence in geothermal fields can result in damage to buildings and related infrastructure. Two geothermal facilities are located approximately 3 miles and 4 miles northwest of the Brawley Campus, respectively. As described under Section 4.1, Existing Conditions, satellite radar interferometry (InSAR) was applied to detect surface deformation associated with geothermal development and concluded that distinct areas of subsidence are present in three geothermal fields in the Imperial Valley, including the Salton Sea, Heber, and East Mesa geothermal fields. In addition, ground uplift was observed at the Heber geothermal field. These geothermal fields are located approximately 15 miles northwest, 19 miles south, and 18 miles southeast of the Brawley Campus, respectively. Therefore, subsidence as a result of geothermal activity does not appear to be occurring at the project site. Well field programs covering production and injection plans in Imperial County are required by the Bureau of Land Management and CalGEM for each major geothermal project and are subject to review by CalGEM and the County, thus minimizing the potential for subsidence to occur. In addition, construction and operation of the proposed Brawley Campus building would not result in substantial adverse impacts such that collapse would occur. As a result, the project would not be located on a geologic unit or soil that is unstable, or that would become unstable as a result of the project, and potentially result in on- or off-site landslide, lateral spreading, subsidence, liquefaction, or collapse. Impacts would be **less than significant.**

d) Would the project be located on expansive soil, as defined in the 2022 California Building Code, creating substantial direct or indirect risks to life or property?

Impacts related to expansive soils were evaluated in Section 3.2, Geology/Soils, of the 2003 EIR, which concluded that although no geotechnical conditions have been identified to preclude development of the IVC Brawley projects as planned, geology/soils impacts are significant because of the hazards from expansive soils if proper construction techniques are not observed at the detailed design and construction stages. Mitigation measures were provided that would require SDSU to 1) prior to detailed site planning, conduct a subsurface geotechnical and soils study to determine the shrink-swell potential, and 2) adhere to recommendations of the geotechnical and soils study in developing grading and construction plans (MMRP page 11-1)[2]. With implementation of the mitigation measures, impacts were determined to be less than significant.

Borings drilled on-site indicated the site is underlain by 1 to 2 feet of fill material, consisting of fat clay. Laboratory testing of these surficial clays indicate these soils have a high to very high expansion potential. Swelling and shrinking soils can result in differential movement of structures including floor slabs and foundations, and project site work including hardscape, utilities, and sidewalks. Project design and construction would occur in compliance with recommendations of the project-specific geotechnical report (Attachment B) and the provisions of the 2022 CBC, which requires that grading, structural design, and construction be completed such that potentially expansive soils would not adversely affect foundations, piping, and related infrastructure. More specifically, based on the geotechnical report required recommendations, thickened foundations and slabs, underlain by at least 5 feet of imported granular non-expansive, compacted fill will be utilized to reduce the potential for future distress to the building associated with soil expansion. Alternatively, a post-tensioned slab-on-grade would be used to support the proposed building. Project design would also be completed in accordance with the DSA and CSU Architecture and Engineering review process. As a result, construction of the project on potentially expansive soils would not create substantial direct or indirect risks to life or property. Impacts would be **less than significant**, and no additional mitigation is required.

e) Would the project have soils incapable of adequately supporting the use of septic tanks or alternative waste water disposal systems where sewers are not available for the disposal of waste water?

The IS completed for the 2003 EIR concluded that no impacts would occur with respect to the use of septic tanks or alternative waste water disposal systems. No new information is available regarding this environmental criteria. The proposed building would be connected to existing sewer infrastructure operated by the city of Brawley. As a result, septic tanks or alternative wastewater disposal systems would not be used in association with the project. **No impacts** would occur.

[2] **3.2 Geology and Soils Mitigation Measures** included on page 11-1 of the 2003 EIR: (1) Adverse discontinuities in strength between major structural elements shall be avoided. (2) Prior to detailed site planning, a subsurface geotechnical and soils study shall be conducted to determine the shrink-swell potential and to develop design specific measures to ensure structural integrity. Grading and construction plans shall conform to recommendations of the study.

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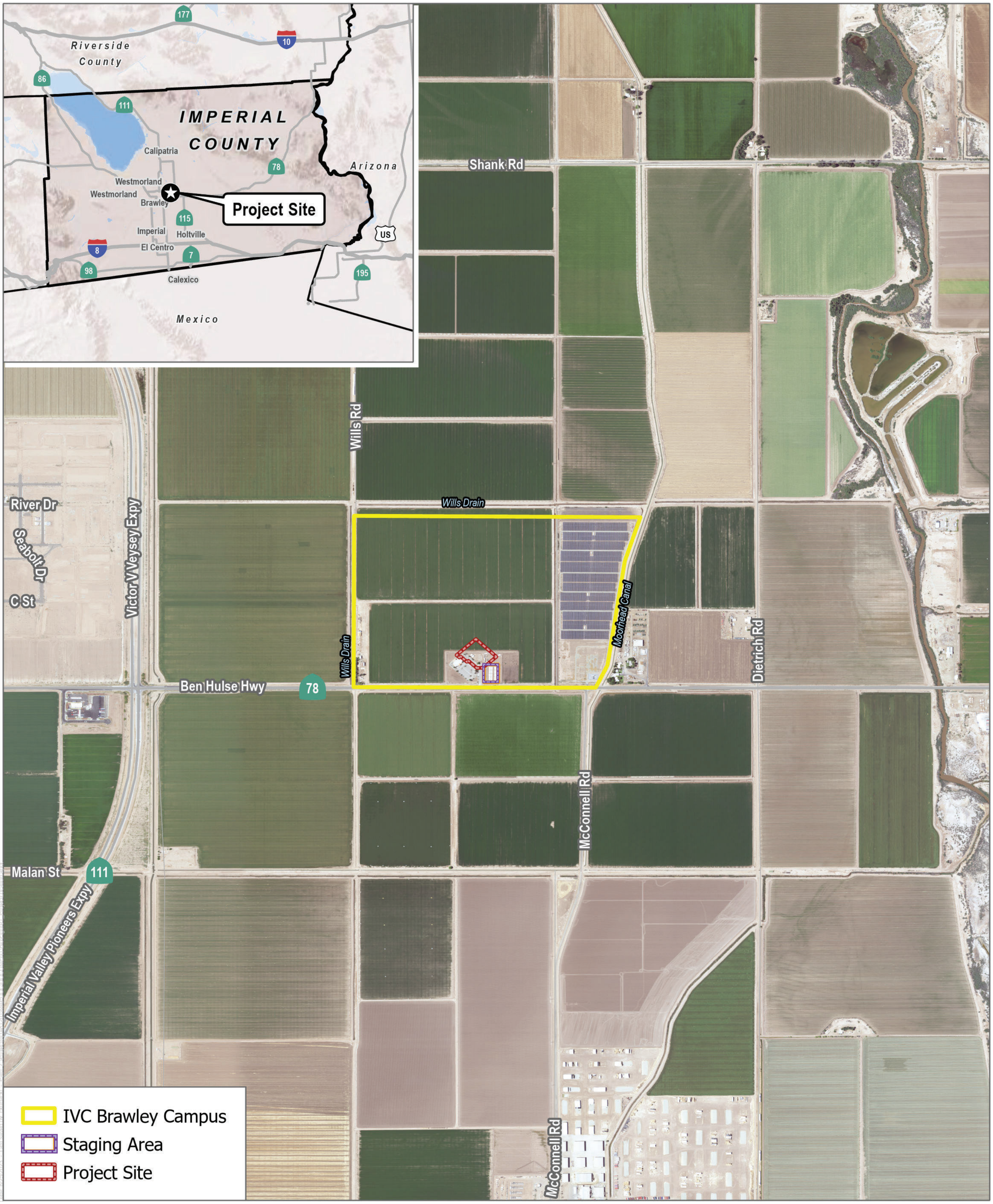
Attachment A
Figures



SOURCE: NAIP 2020, Open Streets Map 2019

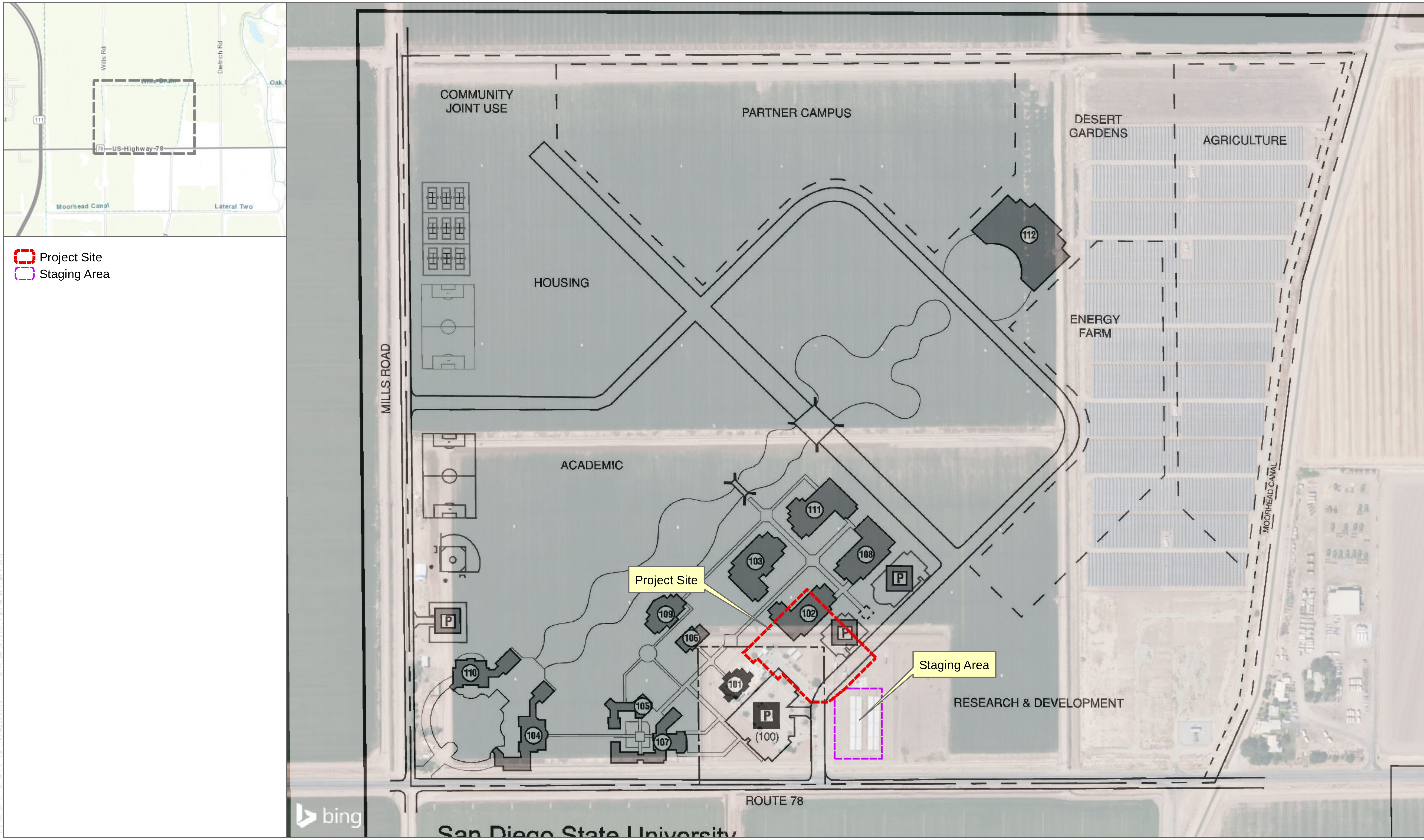
DUDEK

0 1,000 2,000 Feet

FIGURE 1

Regional/Campus Location

SDSU Brawley Sciences Building Project



SOURCE: AERIAL-BING MAPPING SERVICE 2022; CAMPUS MASTER PLAN 2003

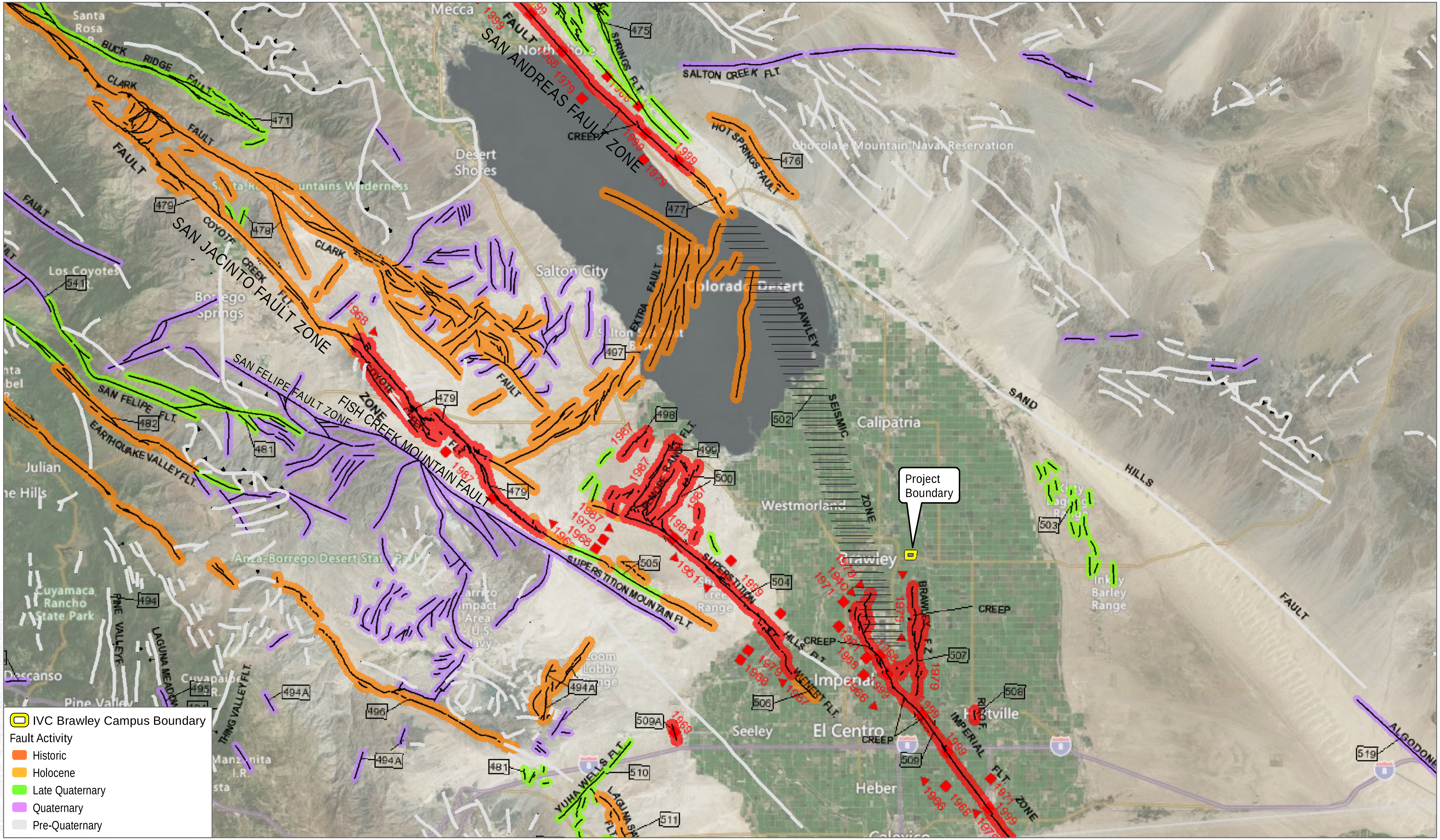
DUDEK

0 175 350 Feet

FIGURE 2

SDSU Brawley Project Site and Staging Area

SDSU Brawley Sciences Building Project



SOURCE: USGS 2022; CGS 2022; County of Imperial; Bing Maps

DUDEK

0 5 10 Miles

FIGURE 3

Regional Faulting

SDSU Brawley Sciences Building Project

Attachment B
Geotechnical Report

REPORT OF GEOTECHNICAL INVESTIGATION
SDSU BRAWLEY STEM FACILITY
SAN DIEGO STATE UNIVERSITY
BRAWLEY, CALIFORNIA

DRAFT

Prepared for

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Project No. SD725A
March 27, 2023

San Diego State University
Facilities Planning, Design & Construction
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Project No. SD725A
March 27, 2023

Attention: Ms. Amanda Scheidlinger

SUBJECT: REPORT OF GEOTECHNICAL INVESTIGATION
SDSU Brawley STEM Facility
San Diego State University
Brawley, California

Ms. Scheidlinger:

Group Delta Consultants, Inc. (Group Delta) are pleased to submit this report of geotechnical investigation for the planned Science, Technology, Engineering, and Mathematics (STEM) Facility at the San Diego State University campus in Brawley, California. This report summarizes our conclusions regarding the geologic site constraints, and provides geotechnical recommendations for remedial grading, foundation, slab, and pavement section design.

We appreciate this opportunity to be of professional service. Please feel free to contact the office with any questions or comments, or if you need anything else.

GROUP DELTA CONSULTANTS

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1.0 INTRODUCTION

The following report provides geotechnical recommendations for the proposed Science, Technology, Engineering, and Mathematics (STEM) Facility to the San Diego State University campus in Brawley, California. The general location of the site is shown in Figure 1A, Site Location. The campus location is shown in more detail in Figure 1B, Site Vicinity. The approximate locations of the subsurface explorations that we completed at the site are shown in Figure 2, Exploration Locations.

1.1 Scope of Services

Our geotechnical services were provided in general accordance with the provisions of the referenced proposal (Group Delta, 2023). The purpose of this work was to characterize the geotechnical constraints to site development, and to provide recommendations for grading and design of the new foundations, slabs, utilities, retaining walls, drainage improvements and pavements. The recommendations provided herein are based on subsurface investigation, the findings from laboratory tests, our engineering analyses, and our previous experience at the site and with similar geologic conditions in the site vicinity. In summary, we provided the following services for this project.

- A visual reconnaissance of the surface characteristics of the site and surrounding areas, and a review of the relevant reports listed in the *References* section of this report.
- A subsurface exploration of the site including three geotechnical borings and five Cone Penetration Test (CPT) soundings along with shear wave velocity measurements. The exploration locations are shown on Figure 2. The Boring Records and CPT data are provided in the figures of Appendix A.
- Laboratory tests were conducted on soil samples collected from the geotechnical borings. Laboratory tests included moisture content, dry density, sieve analysis, Atterberg Limits, Expansion Index, soil corrosivity, unconfined compressive strength, and consolidation. The laboratory test results are summarized in Appendix B.
- Engineering analysis of the field and laboratory data to develop geotechnical recommendations for site preparation, remedial earthwork, foundation, pavement and retaining wall design, soil reactivity, site drainage, and moisture protection.
- Preparation of this report summarizing our findings, conclusions and providing geotechnical recommendations for the proposed STEM facility.

1.2 Site Description

The Brawley Campus of San Diego State University (SDSU) is located at 560 State Route 78 (SR-78) in Brawley, California. The campus in situated within the Imperial Valley about 15 miles south of the Salton Sea, as shown on Figure 1A, Site Location. The campus is located immediately north of SR-78, east of Willis Road and west of McConnell Road, as shown on Figure 1B, Site Vicinity. The campus contains an existing single-story building surrounded by asphalt concrete paved parking areas, landscape areas, and shade structures. The location of the proposed STEM facility is predominantly dirt surfaced and extends into a portion of the site that is currently used for agriculture purposes. The approximate site limits are shown on Figure 2, Exploration Locations.

The SDSU Brawley campus is relatively flat-lying and located more than 130-feet below mean sea level. The campus is surrounded by active agricultural fields. These fields are irrigated by a complex system of canals and drains that are maintained by the Imperial Irrigation District (IID), such as the Moorhead Canal to the east of the site shown in Figure 1B. The crops are drained through a series of shallow subdrains which carry excess irrigation water laterally into open drainage channels such as the Wills Drain One to the east and Lateral One to the southwest (see Figure 1B). One of these open drainage channels runs east-west through the center of the site.

1.3 Proposed Development

We understand that the proposed STEM facility will consist of a two-story structure constructed within the boundaries of the site limits shown on Figure 2, Exploration Locations. The building will likely consist of a tilt-up concrete or steel-framed structure supported on conventional shallow reinforced concrete foundations or a post-tensioned slab. Other new site improvements may include new sidewalks and pavement areas, as well as various new landscape areas, subsurface utilities, and retaining walls.

2.0 FIELD AND LABORATORY INVESTIGATION

The following sections describe the current and prior field and laboratory investigations performed near the proposed development.

2.1 Current Investigation

Our current field investigation included performing three geotechnical borings (B-1 through B-3) and five Cone Penetration Test (CPT) soundings (CPT-6 through CPT-10) on February 17, 2023. The maximum depth explored was about 85 feet below grade. The CPTs were advanced using a 30-ton truck mounted CPT rig, and the borings were completed using truck-mounted drill rig using hollow-stem auger and rotary wash methods. Bulk, Shelby tube, disturbed Standard Penetration Tests (SPT), and less disturbed modified California samples were collected from the borings and were subsequently transported to our laboratory for further visual evaluation and laboratory testing. The exploration locations are shown on Figure 3. The Boring Records and CPT data are provided in Appendix A.

Shear wave velocity measurements were collected at the location of sounding CPT-10 at 5-foot depth intervals to the maximum depth explored. The interval shear wave velocity data is presented in Appendix A and indicates an average shear wave velocity (Vs_{30}) of 190 m/s (or 625 ft/s) in the upper 100 feet.

The laboratory testing program included gradation and hydrometer analyses and Atterberg Limits to aid in material classification according to the Unified Soil Classification System (USCS). Tests were also conducted to help evaluate the soil expansion and corrosivity potential. Unconfined compressive strength and consolidation tests were also performed to evaluate the undrained shear strength and compressibility parameters of the underlying clayey materials. The laboratory test results are shown in Appendix B.

2.1 Prior Investigation

Group Delta previously performed a geotechnical investigation for an addition located on the east side of the existing structure at the site (Group Delta, 2022). The subsurface exploration program included five CPT soundings (CPT-1 through CPT-5) on March 22nd, 2022. The maximum depth explored was about 88½ feet below grade. Shear wave velocity measurements were collected at the location of sounding CPT-5 at 5-foot depth intervals. The interval shear wave velocity data is presented in Appendix A and indicates an average shear wave velocity (Vs30) of 185 m/s (or 610 ft/s) in the upper 100 feet. Bulk soil samples were collected at each CPT sounding location for laboratory testing and geotechnical analysis.

The laboratory testing program included gradation and hydrometer analyses and Atterberg Limits to aid in material classification according to the Unified Soil Classification System (USCS). Tests were also conducted to help evaluate the soil expansion and corrosivity potential. The maximum density and optimum moisture content of a bulk soil sample were determined and used to help remold a fill sample for shear testing.

The CPT locations are shown on Figure 2, Exploration Locations. The CPT data and laboratory testing data are provided in Appendix C, Data from Prior Geotechnical Study. Salient findings from this prior investigation are incorporated in the following sections of this report.

3.0 GEOLOGY AND SUBSURFACE CONDITIONS

The site is located within the north-central portion of the Salton Trough, a topographic and structural depression bound to the north by the Coachella Valley and to the south by the Gulf of California. The Salton Trough is a region of transition from the extensional tectonics of the East Pacific Rise to the transform tectonic environment of the San Andreas system. Late Cenozoic extension of the Gulf of California formed this deep topographic and structural depression.

The Salton Trough is an actively growing rift valley in which sedimentation has almost kept pace with tectonism (Elders, 1979). As rifting continued, the Colorado River delta filled the trough, and conditions gradually changed from marine, to deltaic, to subaerial river and lake deposits. Today, the Mesozoic-age crystalline basement rocks of the trough are covered by about 15,000 feet of Cenozoic marine and nonmarine sedimentary deposits.

The site is located in an area that has been covered by lakes during the Quaternary time. The most recent of the lakes that formed in the Salton Trough was known as Lake Cahuilla, which was formed by flooding of the Colorado River and existed until approximately 300 years ago (Elders, 1979). The old shoreline of Lake Cahuilla can be traced along the Santa Rosa Mountains north of the site, and averages about 40 feet above mean sea level. The site is underlain at depth by hundreds of feet of lacustrine (lake) deposits, overlain by shallow fill.

The general geology in the site vicinity is shown on Figure 3, Geology. A geotechnical cross section of the site is provided in Figure 4. Logs interpreting the subsurface conditions we encountered in the geotechnical borings and CPT soundings during the current investigation are provided in Appendix A, and logs from prior investigation are provided in Appendix C. The geologic materials encountered at the site are described below.

3.1 Lacustrine Deposits

The entire site is underlain by deep lacustrine deposits associated with the ancestral Lake Cahuilla. The lacustrine sediments are estimated to be well over 100 feet thick (Kovach et al., 1962). The lake sediments are typically fine grained, and generally consist of interbedded clays (Unified Soil Classification Symbol CL and CH), with thin lenses of silt (ML) and occasional beds of silty sand (SM). The granular soils within the lake deposits are typically medium dense in consistency. The clays range from low to high plasticity, and range in consistency from soft to stiff.

Laboratory tests indicate that the surficial clays have a high to very high expansion potential and severe soluble sulfate and chloride contents. The estimated undrained shear strength (Su) for the predominately clayey lacustrine deposits typically ranges from about 0.75 to 2 kips per square foot (ksf). The fine-grained lacustrine deposits would therefore be considered medium stiff to stiff in consistency. Shear wave velocity measurements at the location of sounding CPT-10 indicated an average shear wave velocity of about 625 ft/s (or 190 m/s).

Several roughly 2- to 3-foot thick beds of silty sand (SM) were encountered in the explorations at depths ranging from between 18 to 28 feet below existing grade. An approximately 10-foot thick layer of sandy materials was also interpreted in CPT-10 from depths between approximately 50 to 60 feet. These layers were also encountered in previous explorations performed to the west (Group Delta, 2022). The CPT tip resistance in these sandy layers generally exceeded 120 tons per square foot (tsf), and SPT-corrected blow counts generally ranged between 20 and 35, which is indicative of a medium dense to dense material. Our analyses indicate that these zones of material are potentially liquefiable under high seismic demand, as described in the *Earthquake Induced Ground*

Failure section of this report. The location and extent of these continuous, potentially liquefiable, granular lacustrine deposits are also shown in the Geotechnical Cross Section, Figure 4.

3.2 Fill

Approximately one to two feet of fill and/or disturbed agricultural soil were encountered in each of our explorations. Similarly, a few feet of fill were encountered in our prior explorations performed to the west (Group Delta, 2022). The surficial materials generally consist of fat clay (CH) with little or no sand. The fill soils have a high to very high potential for expansion and are considered severely corrosive. At the location of CPT-1 within the parking lot area, the existing pavement section consisted of 3 inches of asphalt concrete over 12 inches of aggregate base. Note that the existing pavements are cracked due to the highly expansive nature of the subgrade.

3.3 Groundwater

Groundwater was measured at a depth of approximately 10 feet below existing site grades. Pore pressure dissipation tests were also conducted within the CPT soundings. The equilibrium pore water pressure measured by these tests was used to estimate the groundwater elevations. These dissipation analyses indicate that the groundwater levels at the site vary from a depth of about 8 to 12 feet below existing site grades. Note that groundwater levels do fluctuate over time due to changes in groundwater extraction, irrigation, or antecedent rainfall. It should also be noted that changes in rainfall, irrigation practices (particularly related to agricultural areas around and within the site that are flood irrigated), or site drainage may produce seepage or locally perched groundwater conditions at any depth within the fill or lacustrine deposits underlying the site.

4.0 GEOLOGIC HAZARDS

The site is located within the Salton Trough of the Colorado Desert geomorphic province, which is one of the most seismically active areas in California, as shown on Figure 5A, Fault Locations. The Salton Trough is the zone of transition between the ocean floor spreading regime in the Gulf of California and the right-lateral, strike-slip regime of the San Andreas system. Geologic hazards at the site are related to the potential for strong ground shaking due to an earthquake on one of several nearby active faults, as well as the potential for associated soil liquefaction and dynamic settlement. Each of the potential geologic hazards is described in more detail below.

4.1 Strong Ground Motion

The site is in a seismically active area. There are several active faults in the site vicinity that have produced moderate to large earthquakes within the past 100 years. The Imperial Fault Zone ruptured with a magnitude 6.9 earthquake in 1940, and again with a magnitude 6.4 earthquake in 1979 (USGS, 1982). The trace of the ground rupture from the 1940 earthquake was located about 5 miles east of the site (see Figure 3 and Figure 5B for the approximate 1940 ground rupture location). Additionally, there are several other known active faults close to the site, including the Superstition Hills and Superstition Mountain fault zones to the northwest, and the Laguna Salada and Cerro Prieto fault zones to the south (see Figures 3 and 5A). The Superstition Hills fault experienced a magnitude 6.7 earthquake in 1987 (Magistrale et al., 1989). In 2010, a magnitude 7.2 earthquake occurred on the Laguna Salada fault zone south of the international border (Gonzalez-Ortega et al., 2014). These earthquakes caused damage to structures throughout Imperial Valley, including soil liquefaction, settlement, and surficial slumps along the Imperial Irrigation District canal and drains (USGS, 1982; Gonzalez-Ortega et al., 2014; Holzer et al., 1989).

The new building will likely be subjected to numerous small to moderate magnitude earthquakes, as well as occasional larger magnitude earthquakes from nearby active faults over its expected life span. The resulting strong ground motions associated with this hazard may be managed by structural design per the governing edition of the California Building Code and California State University (CSU) Seismic Requirements (CSU, 2020). Seismic design parameters are provided in the *Recommendations* section of this report.

4.2 Ground Rupture

Ground rupture results from movement on an active fault reaching the ground surface. The site is not located within an Alquist-Priolo Active Fault Zone and no known active faults are present in the immediate site vicinity, as shown on Figure 5B, Alquist-Priolo Special Studies Zones. Potential for ground rupture from active faulting should therefore be considered low.

4.3 Earthquake-Induced Ground Failure

Potentially liquefiable soils underlie the site. Figure 3, Geology, illustrates that the site is mapped in an area underlain by Quaternary Lake Deposits (i.e., Lacustrine Deposits) that are known to be potentially susceptible to liquefaction and its secondary effects (e.g., earthquake-induced ground failure).

4.3.1 Background

Liquefaction is the sudden loss of soil shear strength within saturated, loose to medium dense, sands and non-plastic silts. Liquefaction is caused by the build-up of pore water pressure during strong ground shaking from an earthquake. Secondary effects of liquefaction are sand boils, settlement and instabilities within sloping ground that occur as lateral spreading, seismic deformation and flow sliding. Lateral spreading is the horizontal deformation of gently sloping ground (slope less than 6 percent), and seismic deformation is the horizontal movement of more steeply sloping ground, both of which can occur during strong ground shaking. Flow sliding is an overall instability of more steeply sloping ground that can occur following or near the end of strong ground shaking, depending on its duration. Associated with liquefaction is seismic compaction, which is the densification of loose to medium dense granular soils that are above groundwater. Of these, liquefaction-induced settlement and seismic compaction are considered more likely to occur given the site surface and subsurface conditions, as discussed below.

4.3.2 Vertical Settlement Analyses

4.3.2.1 Volumetric Settlements

The computer program CLiq (GeoLogismiki, 2019) was used to perform liquefaction triggering calculations using several CPT-based methods, including those recommended by the NCEER Workshops (Youd and Idriss, 2001) and Boulanger and Idriss (2014). CLiq also calculates the estimated free-field volumetric settlement (below groundwater) and seismic compaction (above groundwater). The analyses adopted the following input parameters:

Peak Ground Acceleration (PGA_M): 0.6g
Earthquake Magnitude (Mw): 6.7
Groundwater Level:......................... 10 feet Below Ground Surface

The PGA_M was evaluated using the maximum of the: 1) most recent version of the CSU Seismic Requirements (CSU, 2020), and; 2) maximum considered earthquake geometric mean (MCE_G) peak ground acceleration adjusted for Site Class effects (PGA_M) obtained from the ASCE 7 Hazard Tool (ASCE, 2023) in accordance with ASCE 7-16 (ASCE, 2017) and the 2022 California Building Code (CBSC, 2022). The controlling magnitude used in the liquefaction evaluation was selected by reviewing deaggregation results obtained from the USGS Unified Hazard Tool (USGS, 2023). A design groundwater level of 10 feet below ground surface was adopted based on our groundwater measurements and our interpretation of the soil saturation of in-situ soil samples and CPT pore pressure dissipation test data.

The analyses were performed using data collected from the recent CPTs performed at the site (CPT-6 through CPT-10). The correlated CPT parameters were compared to the results of our field and laboratory testing collected from borings B-1 through B-3. The CPT Soil Behavior Type (SBT) correlated from the CPT data was adjusted to best fit the observations, classifications, and material properties of the soils within the borings.

In accordance with Special Publication 117A (CGS, 2008) and general geotechnical engineering practices, a factor of safety against liquefaction of 1.3 was adopted in the analyses, and the liquefaction analyses was limited to a depth of 60 feet to incorporate the potentially liquefiable layer that extends down to 60 feet.

The liquefaction settlement analyses include depth weighting proposed by Cetin et al. (2009), which consists of a simple linear weighting factor that weights the volumetric strain with depth. This reduces the impact of volumetric strains at large depths. The weighting starts at one at the ground surface and reduces to zero at the weighting limit depth, selected to be the depth of analysis for this project (i.e., 60 feet).

4.3.3 Vertical Settlement Summary

Based on the results of the triggering analyses there are several potentially liquefiable zones within the subsurface profile. In general, the potentially liquefiable soils consist of occasional thin beds that are generally less than 2-foot-thick each, but some up to 4-feet thick locally. The estimated liquefaction-induced volumetric settlement is approximately 1-inch or less at each exploration location. The estimated liquefaction-induced differential settlement is approximately 0.5-inch or less over a horizontal distance of 30 feet.

4.3.4 Instability of Sloping Ground

Since the site is essentially level and the buildings are not located immediately adjacent to sloping ground, the potential for significant liquefaction-induced lateral displacement should be low.

4.4 Landslides

Evidence of ancient landslides or slope instabilities was not observed during our literature review or site reconnaissance and the site is essentially level. Provided that our geotechnical recommendations are properly implemented during construction, it is our opinion that slope instability does not adversely impact the proposed development.

4.5 Tsunamis, Seiches, and Flooding

The distance between the subject site and the gulf precludes damage due to seismically induced waves (tsunamis) or seiches within the Gulf of California. The Salton Sea is located about 15 miles north of the site at more than 230 feet below mean sea level, which is more than 100-feet below the existing site elevations. The Alamo River is located about one mile east of the site, and the New River is located about 3 miles northwest of the site (see Figure 5B). However, the normal water surface elevations in these rivers are roughly 20 to 40 feet below site grades. Further, the site is mapped in Federal Emergency Management Agency (FEMA) zone designated, "Areas determined to be outside the 0.2% annual chance floodplain" (FEMA, 2008). Consequently, the potential for earthquake induced or other flooding at the site is considered to be low. However, the flooding hazard at the site should be evaluated by the project civil engineer.

5.0 GEOTECHNICAL CONDITIONS

Fill and lacustrine deposits underly the site, as discussed in the *Geology and Subsurface Conditions* section of this report. Geotechnical conditions associated with these units are discussed below.

5.1 Expansive Soils

Laboratory tests indicate the surficial soils at the site should have a "High" to "Very High" Potential Expansion. The results of three Expansion Index tests conducted on bulk soil samples obtained from the ground surface to a depth of about 5 feet below existing grades ranged from 92 to 132, averaging 113 with a median of 116 (i.e., High Potential Expansion). Appendix B provides the test results. Similar Expansion Index test results were obtained from samples collected from our prior investigation to the west of the site, as shown in Appendix C (Group Delta, 2022).

5.2 Compressible Soils

Compressible soils underlie the site. Most of these soils are clay that should experience some time dependent consolidation settlement (i.e., long-term settlement). There are also beds of non-plastic silty sand and silt that should settle elastically with the initial fill and structure loading (i.e., short-term settlement). In general, the clay has a medium to high plasticity and we interpret it to be relatively stiff and slightly overconsolidated from consolidation testing, pocket penetrometer tests, unconfined compressive strength testing, CPT interpretations, and Plasticity Index data. The in-situ moisture contents are generally near the Plastic Limit and the Liquidity Indices are less than 0.7, which indicate relatively stiff and low compressibility soils.

Provided minimal fill placement is needed at the site to achieve the proposed finish grades and foundation loading is limited to the bearing pressures provided in the *Recommendations* section of this report, most of the long-term settlement should occur in a relatively short time following initial loading. However, there are zones of thick clay that could experience some time dependent consolidation settlement if significant loading from fill or foundation loads are proposed for the project. *The estimated settlement magnitude and duration associated with proposed fill placements and foundation loads should be evaluated during the design development phase of the project to evaluate the potential impact to the project.*

5.3 Reuse of Onsite Soils

Soils generated from onsite excavations are anticipated to consist of lean and fat clay (CL and CH) and are not considered suitable for re-use as compacted fill without specific recommendations [see the *Post-Tensioned Slabs (Case B – Existing Clay)* section of this report]. Imported fill is anticipated to be needed to replace the highly expansive materials underlying the proposed structures, flatwork, and pavements. Recommendations for imported fill are provided in the *Recommendations* section of this report.

6.0 CONCLUSIONS

The proposed STEM Facility appears to be feasible from a geotechnical perspective, provided that appropriate measures are implemented during design and construction. Several geotechnical conditions exist on site that need to be addressed.

- Laboratory tests indicate that the surficial soils at the site have a high to very high potential for expansion (Expansion Index greater than 90). The use of thickened foundations and slabs underlain by at least five feet of imported granular non-expansive compacted fill could reduce the potential for future distress to the building associated with soil expansion. Alternatively, a post-tensioned slab-on-grade could be used to support the new building. Alternative post-tension slab design parameters are provided for slabs bearing on either imported select sand or compacted on-site clay.
- The site is underlain predominantly by clay soils that are considered compressible. Placement of new fill and foundation loads will induce time dependent settlement. Given that little information is currently available about the proposed structure and site grading, the settlement magnitude and duration associated with proposed fill placements and foundation loads should be evaluated during the design development phase of the project to evaluate potential impacts.
- Soils derived from onsite excavations are not considered suitable for reuse as engineered fill without specific recommendations. Laboratory tests indicate the fill soils primarily consist of lean and fat clay (CL and CH) with a high to very high expansion potential. To reduce the potential for heave related distress, we recommend placing and compacting imported non-expansive granular material beneath structures, pavements, flatwork, and other heave-sensitive improvements.
- Groundwater was encountered at the site at depths ranging from about 8 to 12 feet below existing surface grades. The site is also located in an area of high seismic activity, and the potential does exist for relatively minor earthquake induced liquefaction settlement of the granular lacustrine deposits beneath the site. The use of thickened and heavily reinforced conventional building foundations or post-tensioned slabs could help to reduce the potential for distress to the building associated with post-liquefaction settlement (as well as soil expansion).
- Laboratory tests indicate that the clayey surficial soils at the site present a *severe* risk of sulfate attack and are also *very corrosive* to buried metals. The recommended placement of two to five feet of imported sand beneath the sidewalks and building slabs-on-grade could help to reduce the potential for sulfate attack and corrosion. However, sulfate resistant Type V cement is recommended for use at the site. Various corrosion control measures may also be needed for buried metal structures. A corrosion consultant may be contacted.
- The site is situated within a zone of high seismic activity. The strong ground shaking hazard may be mitigated by structural design in accordance with the applicable provisions of the governing California Building Code and minimum CSU Seismic Requirements. The potential for flooding at the site should be addressed by the project civil engineer.

7.0 RECOMMENDATIONS

The remainder of this report presents recommendations for earthwork construction and the design of the proposed improvements. These recommendations are based on empirical and analytical methods typical of the standards of practice in southern California. If these recommendations do not cover a specific feature of the project, please contact our office for revisions or amendments.

7.1 Plan Review

We recommend that grading and foundation plans be reviewed by Group Delta prior to finalization. We anticipate that substantial changes in the development may occur from the preliminary design concepts used for this investigation. Such changes may require additional geotechnical evaluation, which may result in substantial modifications to the remedial grading and foundation recommendations provided in this report.

7.2 Excavation and Grading Observation

Foundation and grading excavations should be observed by the project geotechnical consultant. During grading, the geotechnical engineer's representative should provide observation and testing services continuously. Such observations are considered essential to identify field conditions that differ from those anticipated by this investigation, to adjust designs to the actual field conditions, and to determine that the remedial grading is accomplished in general accordance with the recommendations presented in this report. The recommendations provided in this report are contingent upon Group Delta Consultants providing these services. Our personnel should perform sufficient testing of fill and backfill during grading and improvement operations to support our professional opinion as to compliance with the compaction recommendations.

7.3 Earthwork

Grading and earthwork should be conducted in general accordance with the requirements of the current California Building Code, CSU Grading Ordinances, and the earthwork recommendations provided within this report. The following recommendations are provided regarding specific aspects of the proposed earthwork. These recommendations should be considered subject to revision based on the conditions observed by the geotechnical consultant during the grading operations.

7.3.1 Site Preparation

General site preparation should begin with the removal of deleterious materials, including any existing structures, vegetation, turf, contaminated soil, trash, and demolition debris. Existing subsurface utilities or groundwater wells that underly the proposed improvements should be properly abandoned and relocated outside of the proposed building footprint. Excavations associated with abandonment operations should be backfilled and compacted as described in *Fill Compaction* Section of this report. Wells, if present, should be abandoned per local and State guidelines. Alternatively, abandoned utilities may be grouted with a two-sack sand-cement slurry under the observation of the project geotechnical consultant.

7.3.2 Improvement Areas

At least two feet of import granular compacted fill with an Expansion Index less than 20 is recommended beneath new concrete sidewalks and exterior flatwork areas. To accomplish this objective, the upper two feet of soil below slab subgrade (i.e., bottom of the slab) should be excavated and removed from the site. The over-excavation should include the soil within 2-feet of the sidewalk perimeter (measured horizontally). The resulting excavation surface should be scarified to a depth of 12 inches, brought to 3-percentage points or more above optimum moisture content and compacted to at least 90 percent of the maximum dry density per ASTM D1557. The excavation bottom should then be backfilled to the planned slab subgrade elevations using an imported non-expansive granular material and be compacted in accordance with the recommendations in the *Fill Compaction* section below. Subgrade compaction should be conducted immediately prior to placing concrete or base.

7.3.3 Building Areas

The clayey lacustrine deposits beneath the proposed building consist of lean clay (CL) and fat clay (CH) that have a “high” to “very high” expansion potential. We recommend that clayey soil beneath the proposed building be removed to 5 feet below the finish pad elevations (i.e., below the bottom of the slab) or 3 feet below the bottom of foundations, whichever is deeper. The remedial excavations should extend at least 5 feet horizontally beyond the perimeter of the proposed building, including any isolated pad footings that are outside of the building footprint. However, the excavations should not pass below a 1:1 plane extending down and out from the bottom outside edge of any existing foundations to avoid undermining and potential distress to existing structures. The resulting excavation surface should be scarified to a depth of approximately 12 inches, brought to 3-percentage points or more above optimum moisture content, and compacted to at least 90 percent of the maximum dry density at per ASTM D1557. The excavation should then be backfilled to the planned slab subgrade elevations using an imported non-expansive (Expansion Index less than 20) granular material and be compacted in accordance with the recommendations in the *Fill Compaction* section below.

7.3.4 Fill Compaction

Fill and backfill should be placed and compacted at or slightly above optimum moisture content per ASTM D1557 using equipment capable of producing a uniformly compacted product. The maximum loose lift thickness should be 8 inches, unless performance observed and testing during earthwork indicates a thinner loose lift is needed, or a thicker loose lift is possible, up to a loose lift thickness of 12 inches.

The minimum recommended relative compaction is 90 percent of the maximum dry density per ASTM D1557. Sufficient observation and testing should be performed by the project geotechnical consultant during grading so that an opinion can be rendered as to the compaction achieved. Rocks or concrete fragments greater than 6 inches in maximum dimension should not be used in compacted fill.

A two-sack sand and cement slurry may be used as an alternative to compacted fill soil. It has been our experience that slurry is often useful in confined areas which may be difficult to access with typical compaction equipment. A minimum 28-day compressive strength of 100 psi is recommended for the two-sack sand and cement slurry. Samples of the slurry should be fabricated and tested for compressive strength during construction.

7.3.5 Import Soil

Imported fill sources should be observed and tested by the project geotechnical consultant prior to hauling onto the site to evaluate the suitability for use. In general, imported fill materials should consist of granular soil with 100 percent passing the 3-inch sieve, more than 70 percent passing the ¾-inch sieve, and less than 35 percent passing the No. 200 sieve based on ASTM C136, and have an Expansion Index less than 20 based on ASTM D4829. Import soils should also have a negligible potential for sulfate attack (i.e., sulfate content less than 0.1 percent). Samples of the proposed import should be tested by the geotechnical consultant to evaluate the suitability of these materials for their proposed use.

Additional testing per the guidelines provided by the Department of Toxic Substances Control (DTSC, 2001) is required by the Owner prior to accepting soil for import. The test results should meet the most stringent State and Federal residential screening levels including the most up-to-date DTSC Modified Screening Levels (DTSC-SLs) and United States Environmental Protection Agency Regional Screening Level (RSL).

7.3.6 Subgrade Stabilization

All excavation bottoms should be firm and unyielding prior to placing fill. In areas of saturated or "pumping" subgrade, a geogrid such as Tensar TX7 (or approved similar) may be placed directly on the excavation bottom, and then covered with at least 12 inches of minus ¾-inch aggregate base. Once the excavation is firm enough to attain the recommended compaction within the base, the remainder of the excavation may be backfilled using either compacted soil or aggregate base. If wet soil conditions are encountered where further excavations are needed, an additional 12-inches of free draining open graded material (such as minus ¾-inch crushed rock) should be placed between the stabilizing geogrid and the compacted well graded aggregate base. The open graded material should be completely enveloped in filter fabric (such as Mirafi 140N or approved similar).

7.3.7 Temporary Excavations

Temporary excavations may be needed to construct the planned improvements. Excavations should conform to Cal/OSHA guidelines (2021). In general, we recommended that temporary excavations be inclined no steeper than 1:1 for heights up to 5 feet. Vertical excavations should be shored. Any excavations that encounter groundwater seepage should be evaluated on a case-by-case basis.

The design, construction, maintenance, and monitoring of all temporary slopes is the responsibility of the contractor. The contractor should have a competent person evaluate the geologic conditions encountered during excavation to determine permissible temporary slope inclinations and other measures as required by Cal/OSHA. The below assessment of Cal/OSHA Soil Types for temporary slopes is based on preliminary engineering classifications of material encountered in widely spaced explorations.

Based on the findings of our subsurface investigation, the following Cal/OSHA Soil Types may be assumed for planning purposes.

PRELIMINARY CAL/OSHA SOIL TYPES

Geologic Unit	Cal/OSHA Soil Type
Fill	Type B[1]
Lacustrine Deposits	Type B[1]

1. This assumes that no groundwater seepage or caving is encountered in the excavations.

7.4 Surface Drainage

Foundation and slab performance depends greatly on how well surface runoff drains from the site. The ground surface should be graded so that water flows rapidly away from structures and top of slopes without ponding. The surface gradient needed to achieve this may depend on the prevailing landscaping. Planters should be designed and built so that water will not seep into the foundation, slab, pavement, or other heave/settlement structure areas. If roof drains are used, the drainage should be channeled by pipe to the storm drain system, or discharge at least 10 feet from buildings. Irrigation should be limited to the minimum needed to sustain landscaping, and consideration should be given to utilizing drought tolerant landscape to further minimize water used for irrigation. Existing drainage channels through the proposed site should be re-routed and graded do drain away from improvement areas. Excessive irrigation, surface water, water line leaks, or rainfall may cause perched groundwater to develop within the underlying soil.

7.5 Storm Water Management

We anticipate that various bioretention basins, swales or pervious paver block pavements may be proposed to promote on-site infiltration for storm water Best Management Practice (BMP). In order to help evaluate the feasibility of on-site infiltration, the infiltration rate of the on-site soil may be estimated using borehole percolation or double ring infiltrometer tests conducted within the planned BMP areas. However, our experience indicates that infiltration testing in clay soils should result in a “No Infiltration” condition per the applicable BMP Design Manual. An infiltration rate of less than 0.01 inches per hour is estimated based on previous infiltration tests we have conducted in similar clay soils. The clays typically have a permeability of 10^{-7} to 10^{-9} cm/s (essentially impermeable).

7.6 Seismic Design

Structures should be designed in general accordance with the governing seismic provisions of the 2022 California Building Code, as well as the minimum seismic design requirements of the California State University (CSU, 2020). Field testing consisting of shear wave measurements in CPT-10 resulted in average shear wave velocity in the upper 30 meters ($V_{S,30}$), or 100 feet, of approximately or 190 m/s (625 ft/s). Based on these measurements, the Site Classification using Chapter 20 of ASCE 7-16 would be Site Class D. The following preliminary seismic design parameters are recommended by the California State University Seismic Requirements (CSU, 2020) for the site.

CSU – SDSU IMPERIAL CAMPUS SEISMIC DESIGN PARAMETERS

Hazard Level	Parameter	Site Class D
BSE-1N	PGA_D	0.40
	S_{D0}	0.40
	S_{DS}	1.00
	S_{D1}	0.68
BSE-2N	PGA_M	0.59
	S_{M0}	0.60
	S_{MS}	1.50
	S_{M1}	1.02

7.7 Foundation Recommendations

The foundations for the new buildings should be designed by the project structural engineer using the following geotechnical parameters. These are only minimum criteria, and should not be considered a structural design, or to preclude more restrictive criteria of governing agencies or the structural engineer. The following recommendations should be considered preliminary, and subject to revision based on decisions made during design development and the conditions observed by the geotechnical consultant during grading.

7.7.1 Conventional Foundations

The following recommendations assume that remedial grading will be conducted for the building pad area as recommended in the *Earthwork* Section, and that the building pad grade will be underlain by at least 5-feet of imported granular non-expansive compacted fill (Expansion Index of 20 or less). Conventional shallow foundations would be considered appropriate for this condition, as shown in Figure 6.

Allowable Bearing:	*2,000 psf (allow ⅓ increase for short-term wind or seismic loads)*
Minimum Footing Width:	*12 inches*
Minimum Footing Depth:	*24 inches below lowest adjacent soil grade*
Minimum Reinforcement:	*Two No. 5 bars at both top and bottom in continuous footings*

7.7.2 Post-Tensioned Slabs

Two different post-tensioned slab foundation design conditions are summarized below. Case A provides recommendations assuming the building will be underlain by at least 5-feet of imported granular non-expansive compacted fill, and Case B assumes that a post-tension slab foundation may be designed to bear directly on recompacted expansive on-site clay. The following recommendations are provided using the Post-Tensioning Institute (PTI) Document *PTI DC10.5-19* (2019).

7.7.2.1 Case A – Select Fill

For Case A, we have assumed that remedial grading will be conducted per our recommendations, and that the proposed building will be underlain by at least 5-feet of imported granular non-expansive compacted fill in accordance with the *Earthwork* Section of this report, overlying the existing expansive clay. The following post-tension slab foundation design parameters are considered applicable to buildings that will be underlain by such conditions. Note that these recommendations should be considered preliminary, and subject to revision based on the as-graded conditions observed by the geotechnical consultant during fine grading of the site.

Post-Tension Slab Design Parameters (Case A):

Moisture Variation Distance, e_m:	*Center Lift:*	*5.5 feet*
	Edge Lift:	*2.5 feet*
Differential Soil Movement, y_m:	*Center Lift:*	*0.7 inches*
	Edge Lift:	*1.2 inches*
Allowable Bearing:	*2,000 psf at slab subgrade*	

7.7.2.2 Post-Tensioned Slabs (Case B – Existing Clay)

As an alternative to remedial grading to replace the highly expansive clays with imported sand as described in Case A above, a post-tension slab foundation may be designed to bear directly on the highly expansive on-site clay. For Case B, the undocumented fill soils underlying the proposed structure should be excavated and replaced as a uniformly compacted fill beneath the building (as a minimum). The undocumented fill depth is anticipated to extend approximately two to three feet below existing grades at the site. The clayey fill soil should be compacted to at least 90 percent relative compaction at 3-percentage points or more above optimum moisture content per ASTM D1557. The following post-tension slab foundation design parameters are considered appropriate for a building underlain by recompacted clayey fill soils.

Post-Tension Slab Design Parameters (Case B):

Moisture Variation Distance, e_m:	*Center Lift:*	*5.5 feet*
	Edge Lift:	*3.0 feet*
Differential Soil Movement, y_m:	*Center Lift:*	*2.5 inches*
	Edge Lift:	*4.0 inches*
Allowable Bearing:	*2,000 psf at slab subgrade*	

7.7.3 Settlement

Total and differential settlements of the proposed structure due to the allowable bearing loads provided above are not expected to exceed 1.5 and 0.75 inches in 30 feet, respectively. In addition to static settlement, the site may experience post-liquefaction total and differential settlements on the order of approximately 1-inch and 0.5 inches in 30 feet, respectively, as discussed in *Earthquake Induced Ground Failure* Section.

7.7.4 Lateral Resistance

Lateral loads against the structure may be resisted by friction between the bottoms of footings and slabs and the underlying soil, as well as passive pressure from the portion of vertical foundation members embedded into compacted fill. A coefficient of friction of 0.25 and a passive pressure of 250 psf per foot of depth may be used for level ground conditions.

7.8 On-Grade Slabs

Conventional concrete building slabs should be at least 6 inches thick and should be reinforced with at least No. 3 bars on 12-inch centers, each way. Slab thickness, control joints, and reinforcement should be designed by the project structural engineer and should conform to the requirements of the current California Building Code and based on the proposed slab loading.

7.8.1 Moisture Protection for Slabs

Moisture protection should comply with requirements of the current CBC, American Concrete Institute, and the desired functionality of the interior ground level spaces. The project Architect typically specifies an appropriate level of moisture protection considering allowable moisture transmission rates for the flooring or other functionality considerations.

Moisture protection may be a “Vapor Retarder” or “Vapor Barrier” that use membranes with a thickness of 10 and 15 mil or more, respectively. The membrane may be placed between the concrete slab and the clean sand or finished subgrade immediately below the slab, provided it is protected from puncture and repaired per the manufacturer’s recommendations if damaged. Note that the CBC specifies that a capillary break such as 4 inches of clean sand be used beneath building slabs (as defined and installed per the California Green Building Standards), along with a Vapor Retarder.

7.9 Exterior Slabs

Exterior slabs and sidewalks subjected to pedestrian traffic and light vehicle loading (e.g., golf carts) should be at least 4 inches thick and underlain by 2-feet of imported granular non-expansive compacted fill in accordance with the *Improvement Areas* section of this report. Control joints should be placed on a maximum spacing of 10-foot centers, each way, for slabs, and on 5-foot centers for sidewalks. The potential for differential movements across the control joints may be reduced by using steel reinforcement. Typical reinforcement would consist of 6x6 W2.9/W2.9 welded wire fabric placed securely at mid-height of the slab.

7.10 Earth-Retaining Structures

Backfilling retaining walls with expansive soil can increase lateral pressures well beyond normal active or at-rest pressures. Retaining walls should be backfilled with import granular material with an Expansion Index of less than 20. The on-site soils do not meet this criterion. Retaining wall backfill should be compacted to at least 90 percent relative compaction based on ASTM D1557. Backfill should not be placed until the retaining walls have achieved adequate strength. Heavy compaction equipment should not be used. Retaining wall foundations should be designed using the recommendations included in the *Shallow Foundations* section of this report.

7.10.1 Cantilever Walls

Cantilever retaining walls with level granular backfill may be designed using an active earth pressure approximated by an equivalent fluid pressure of 35 pounds per cubic foot (pcf). The active pressure should be used for walls free to yield at the top at least ½ percent of the wall height. Retaining walls that are located adjacent to vehicular traffic areas may be designed to resist a uniform lateral surcharge pressure of 100 pounds per square foot (psf), resulting from a typical 300 psf traffic surcharge acting behind the wall. Retaining walls should contain adequate drainage to relieve the buildup of hydrostatic pressures. Our recommended wall drainage details are shown in Figure 7.

7.11 Preliminary Pavement Design

For all pavement areas, the upper 12 inches of clayey subgrade soil (below the pavement aggregate base section) should be removed. This removal should extend 2 feet or more beyond the outside edge of the pavement perimeter measured horizontally. The resulting excavation surface should be scarified immediately prior to constructing the pavements, brought to optimum moisture, and compacted to at least 90 percent of the maximum dry density at 3-percentage points or more above optimum moisture content per ASTM D1557. The excavation bottom should then be backfilled to the planned pavement subgrade (i.e., bottom of the aggregate base section) using an imported non-expansive (expansion index less than 20) granular soil (i.e., subbase). Aggregate base and subbase should be compacted to 95 percent relative compaction at or slightly above optimum moisture content per ASTM D1557. Aggregate base should conform to the Standard Specifications for Public Works Construction (*SSPWC),* Sections 200-2.2, -2.4, or -2.5 (PWSI, 2021). Asphalt concrete should conform to Section 203-6 of the *SSPWC* and should be compacted to 91 and 97 percent of the Rice density per ASTM D2041 (PWSI, 2021).

7.11.1 Asphalt Concrete

Based on our previous experience, we anticipate that the clayey on-site soils have an R-Value of 5 or less. Preliminary asphalt concrete pavement design was conducted using the Caltrans Design Method (2018). We anticipate that a Traffic Index ranging from 5.0 to 6.0 may apply to new pavement areas. The project civil engineer should review the assumed Traffic Indices to determine if and where they may be applicable. Based on the minimum R-Value of 5 and the assumed range of Traffic Indices, the following pavement sections would apply.

SUMMARY OF PRELIMINARY ASPHALT CONCRETE PAVEMENT SECTIONS

PAVEMENT TYPE	TRAFFIC INDEX	ASPHALT SECTION	BASE SECTION	SUBBASE SECTION[1]
Passenger Car Parking	5.0	3 Inches	10 Inches	12 Inches
Light Truck Traffic Areas	6.0	4 Inches	12 Inches	12 Inches

*1) **NOTE**: One foot of imported granular non-expansive subbase should be placed beneath the pavement section to reduce the potential for cracking due to soil heave/shrink behavior.*

7.11.2 Portland Cement Concrete

Concrete pavement design was conducted in general accordance with the simplified design procedure of the Portland Cement Association (1984). This methodology is based on a 20-year design life. For design, it was assumed that aggregate interlock would be used for load transfer across control joints. The concrete was assumed to have a minimum flexural strength of 600 psi. The flexural strength of the pavement concrete should be confirmed during construction using ASTM C78. For concrete pavement design, the subgrade materials were assumed to provide "low" support, based on our experience with similar materials. Using these assumptions and the same traffic indices presented previously, we recommend that the PCC pavement sections at the site consist of at least 6 inches of concrete placed over 6 inches of compacted aggregate base over 12 inches of imported granular non-expansive subbase (Expansion Index less than 20).

Crack control joints should be constructed for PCC pavements on a maximum spacing of 10 feet, each way. Concentrated truck traffic areas, such as trash truck aprons and loading docks, should be reinforced with number 4 bars on 18-inch centers, each way.

7.12 Pipelines

The planned addition may include various pipelines such as water, storm drain and sewer systems. Geotechnical aspects of pipeline design include lateral earth pressures for thrust blocks, modulus of soil reaction, and pipe bedding. Each of these parameters is discussed below.

7.12.1 Thrust Blocks

Lateral resistance for thrust blocks may be evaluated using a passive pressure value of 250 pounds per square foot (psf) per foot of embedment, assuming a triangular distribution and level ground conditions. This value may be used for thrust blocks embedded into compacted fill soils as well as the underlying lacustrine deposits, provided that these soils are located above the groundwater table.

7.12.2 Modulus of Soil Reaction

The modulus of soil reaction (E') is used to characterize the stiffness of soil backfill placed along the sides of buried flexible pipelines. For the purpose of evaluating deflection due to the load associated with trench backfill over the pipe, a value of 700 pounds per square inch (psi) is recommended for the general conditions, assuming granular bedding material is placed around the pipe and the soils are located above the groundwater table.

7.12.3 Pipe Bedding

Typical pipe bedding as specified in the *Standard Specifications for Public Works Construction* may be used. As a minimum, we recommend that pipes be supported on at least 4 inches of granular bedding material such as minus ¾-inch crushed rock, disintegrated granite or granular materials with a Sand Equivalent of 20 or more. Where open graded material (e.g., ¾-inch minus crushed rock) is used as bedding and shading around and above the pipe, we recommend that open graded material should be completely enveloped in filter fabric (such as Mirafi 140N).

Where pipeline or trench excavations exceed a 15 percent gradient, we do not recommend that open graded rock be used for bedding or backfill because of the potential for piping and internal erosion. For sloping utilities, we recommend that coarse sand with a Sand Equivalent of 20 or more or sand-cement slurry be used for the bedding and pipe zone. The slurry should consist of a 2-sack mix having a slump no greater than 5 inches.

7.13 Reactive Soils

In order to assess the sulfate exposure of concrete in contact with the site soils, samples were tested for pH, resistivity, water-soluble sulfate and chloride content, as shown in Appendix B. The sulfate test results indicate that the on-site soils present a *severe* potential for sulfate attack based on commonly accepted criteria (Bentivegna et al., 2020). A *negligible* sulfate content is recommended for any imported soils and should be confirmed through laboratory testing prior to import.

The saturated resistivity and chloride content of the near surface soils are indicative of a *corrosive* to *very corrosive* soil with respect to buried metals based on commonly accepted criteria (Caltrans, 2021). Typical corrosion control measures should be incorporated into the project design, such as providing minimum clearances between reinforcing steel and soil, and sacrificial anodes for any buried metal structures. A corrosion consultant may be contacted for specific recommendations.

8.0 LIMITATIONS

This report was prepared using the degree of care and skill ordinarily exercised, under similar circumstances, by reputable geotechnical consultants practicing in similar localities. No warranty, express or implied, is made as to the conclusions and professional opinions included in this report.

The findings of this report are valid as of the present date. However, changes in the condition of a property can occur with the passage of time, whether due to natural processes or the work of humans on this or adjacent properties. In addition, changes in applicable or appropriate standards of practice may occur from legislation or the broadening of knowledge. Accordingly, the findings of this report may be invalidated wholly or partially by changes outside our control. Therefore, this report is subject to review and should not be relied upon after a period of three years.

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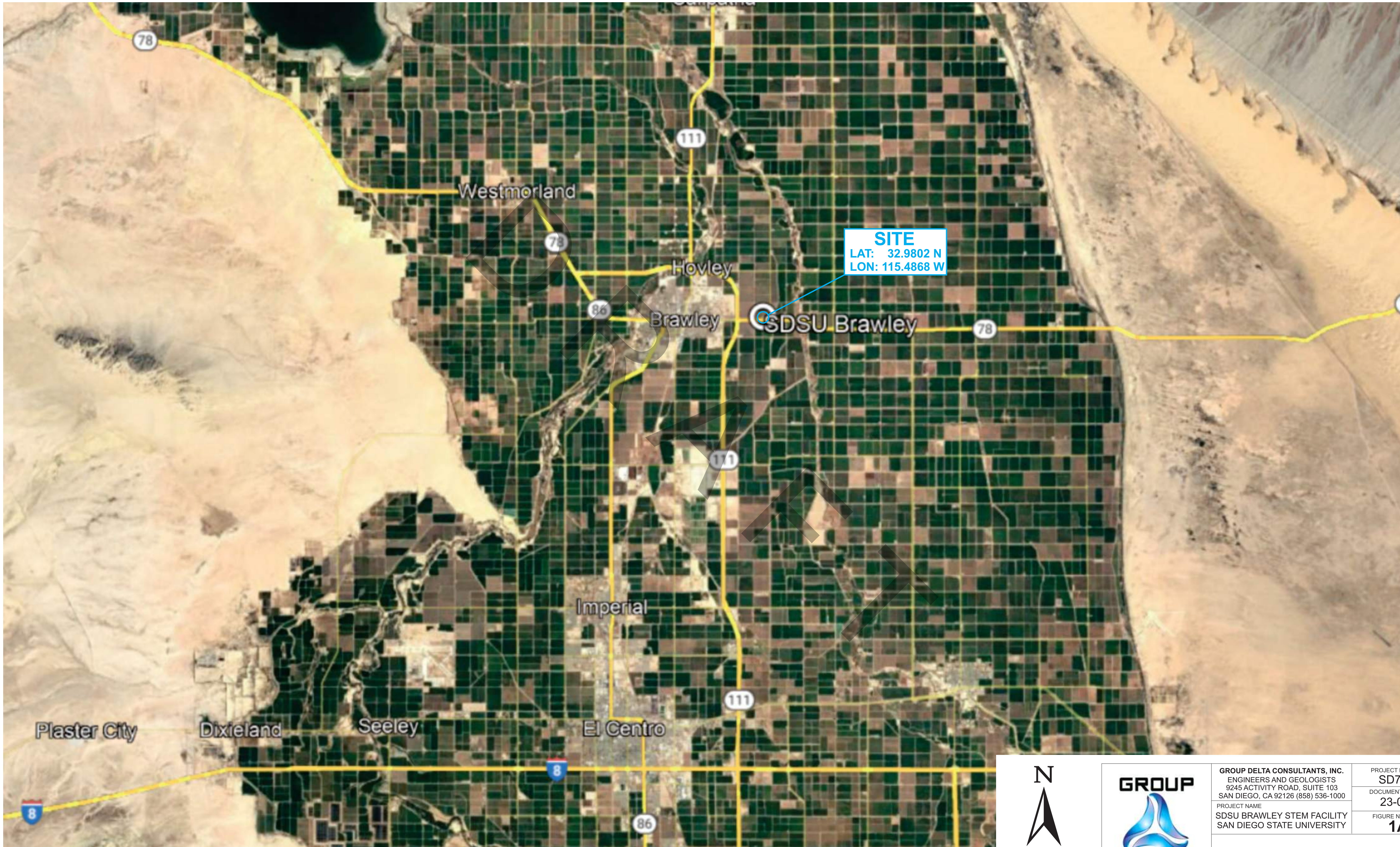
FIGURES



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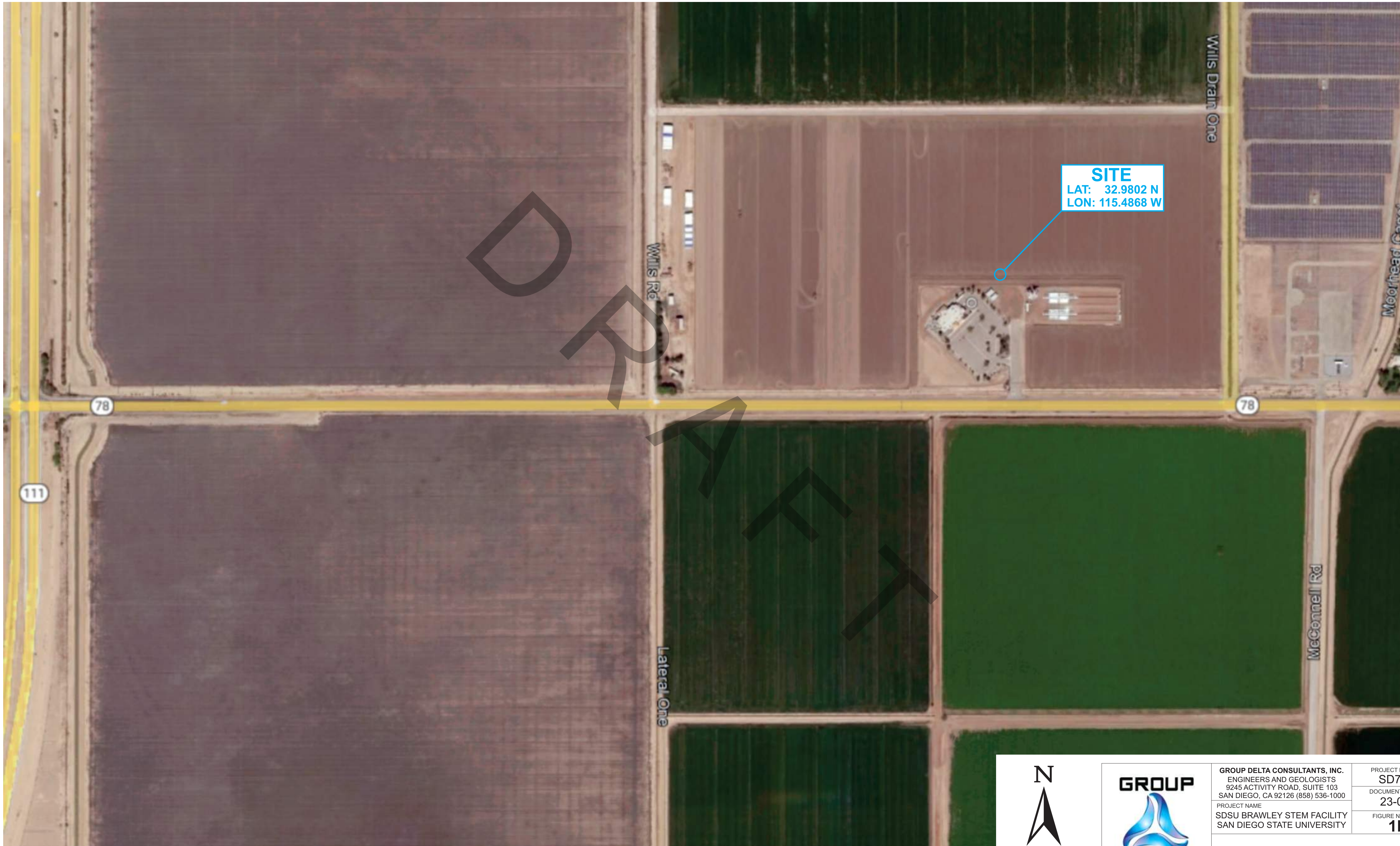
PROJECT NUMBER	SD725A
DOCUMENT NUMBER	23-0017
PROJECT NAME	SDSU BRAWLEY STEM FACILITY SAN DIEGO STATE UNIVERSITY
FIGURE NUMBER	1A

SITE LOCATION



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NO SCALE

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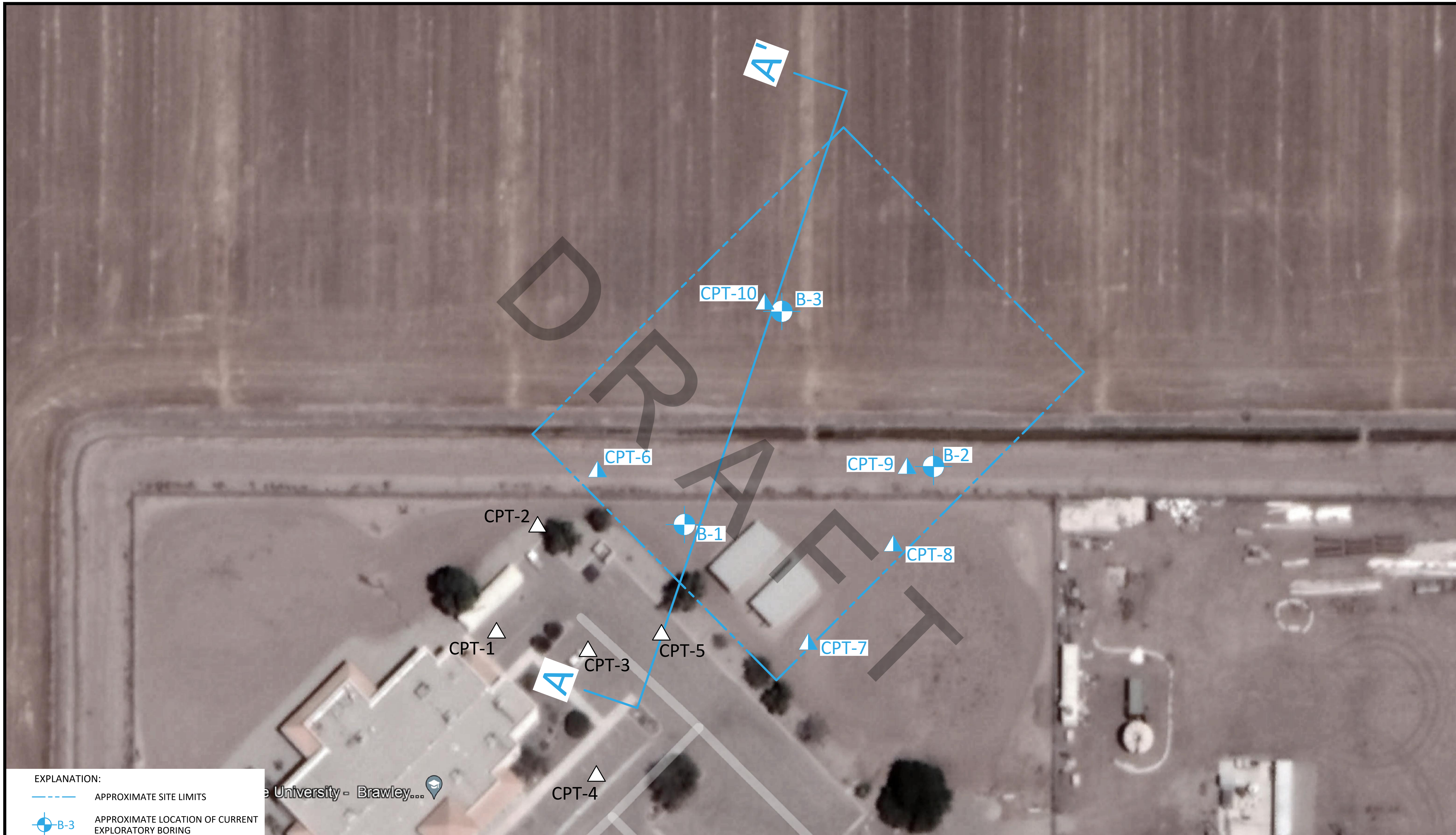
PROJECT NAME
SDSU BRAWLEY STEM FACILITY
SAN DIEGO STATE UNIVERSITY

PROJECT NUMBER
SD725A

DOCUMENT NUMBER
23-0017

FIGURE NUMBER
1B

SITE VICINITY



EXPLANATION:

- APPROXIMATE SITE LIMITS
- B-3 APPROXIMATE LOCATION OF CURRENT EXPLORATORY BORING
- CPT-10 APPROXIMATE LOCATION OF CURRENT CONE PENETRATION TEST
- B-1 APPROXIMATE LOCATION OF PREVIOUS CONE PENETRATION TEST (GROUP DELTA, 2022)
- A A' APPROXIMATE LOCATION OF GEOTECHNICAL CROSS SECTION

N

0 50' 100'

REFERENCE: GOOGLE, INC (2023) GOOGLE EARTH PRO, AERIAL IMAGERY DATED: AUGUST 23, 2020

SDSU BRAWLEY STEM FACILITY SAN DIEGO STATE UNIVERSITY	EXPLORATION LOCATIONS	GROUP DELTA	
		PROJECT NUMBER	FIGURE NUMBER
		SD725A	2

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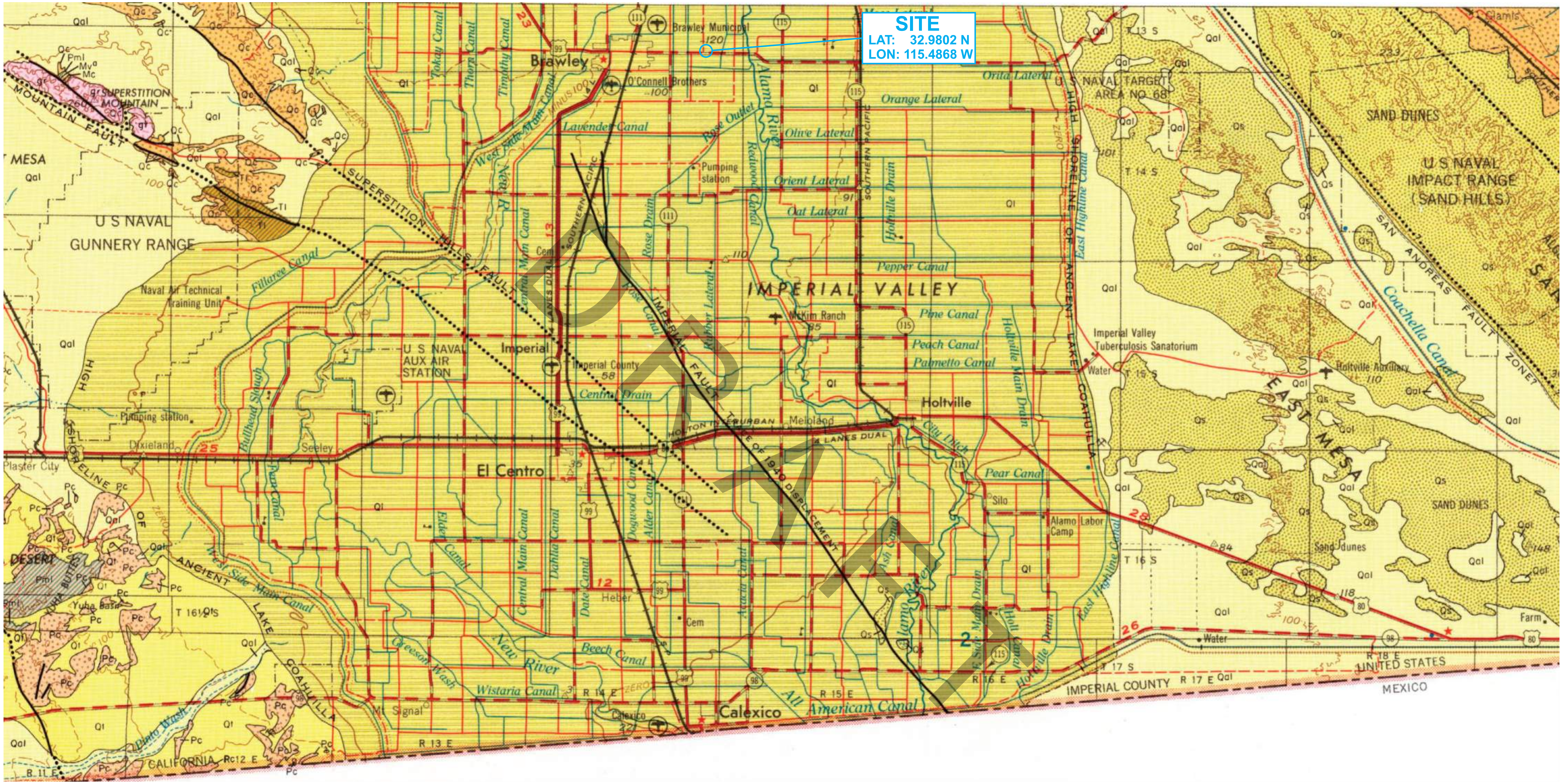

EXPLANATION:

- Ql — Quaternary lake deposits
- Qal — Alluvium
- Qs — Dune sand
- Qt — Quaternary nonmarine terrace deposits
- Qc — Pleistocene nonmarine

Reference: Rudolph Strand (1962). Geologic Map of California, San Diego-El Centro, Scale 1:250,000.

N

NO SCALE

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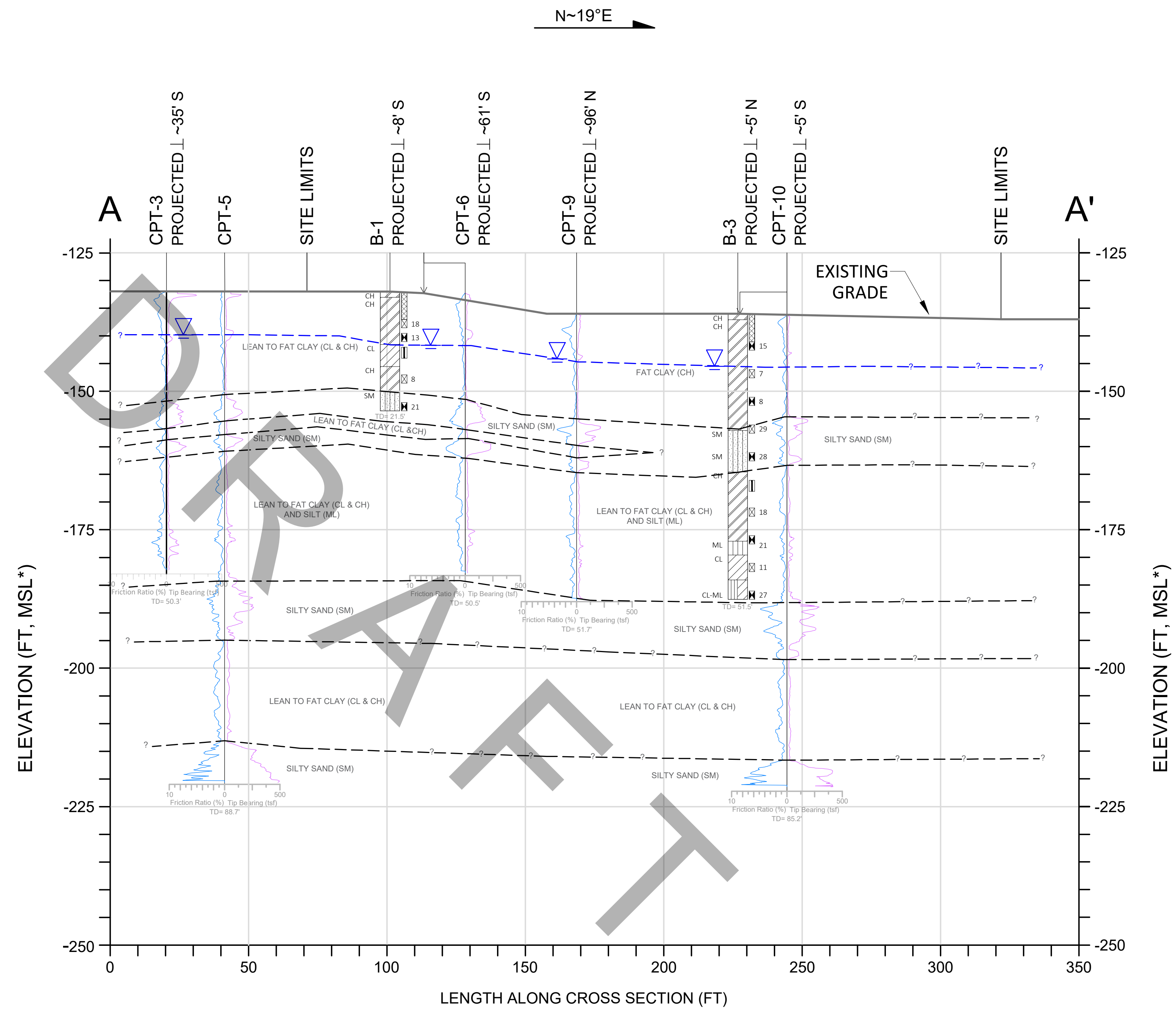
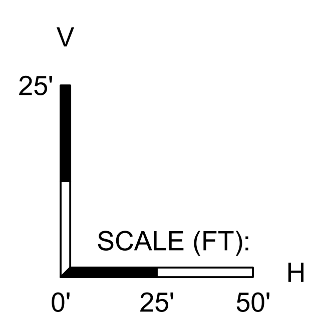
PROJECT NUMBER	SD725A
DOCUMENT NUMBER	23-0017
PROJECT NAME	SDSU BRAWLEY STEM FACILITY SAN DIEGO STATE UNIVERSITY
FIGURE NUMBER	3

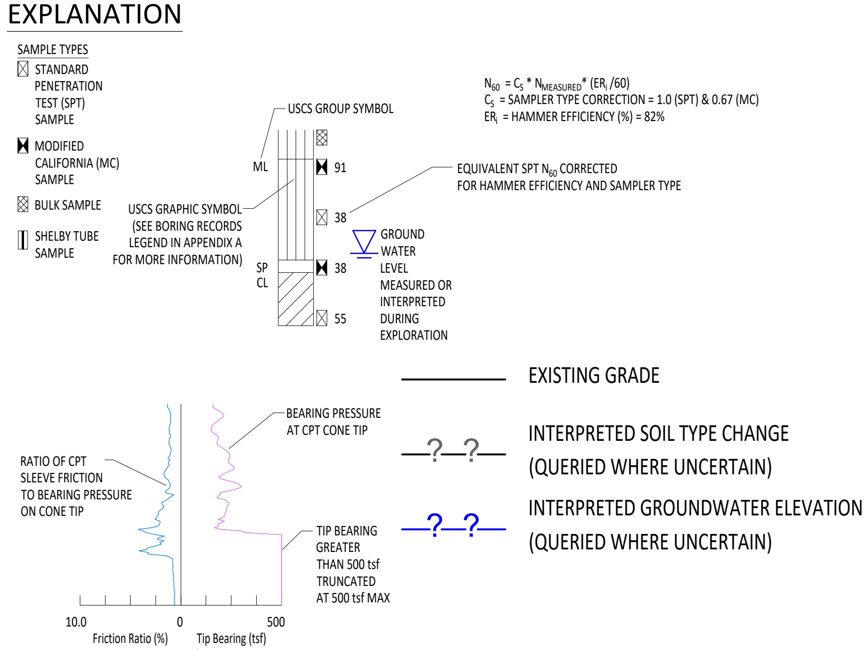
GEOLOGY





REFERENCE: GOOGLE, INC (2023) GOOGLE EARTH PRO, AERIAL IMAGERY DATED: AUGUST 23, 2020

EXPLANATION



$N_{60} = C_S * N_{MEASURED} * (ER_i/60)$
C_S = SAMPLER TYPE CORRECTION = 1.0 (SPT) & 0.67 (MC)
ER_i = HAMMER EFFICIENCY (%) = 82%

NOTE: DIRECTIONS, LOCATIONS, ELEVATIONS, AND SCALE ARE APPROXIMATE
*ELEVATION ESTIMATED USING GOOGLE EARTH PRO (GOOGLE INC., 2023)

SDSU BRAWLEY STEM FACILITY SAN DIEGO STATE UNIVERSITY	GEOTECHNICAL CROSS SECTION A-A'	GROUP DELTA	
		PROJECT NUMBER SD725A	FIGURE NUMBER 4

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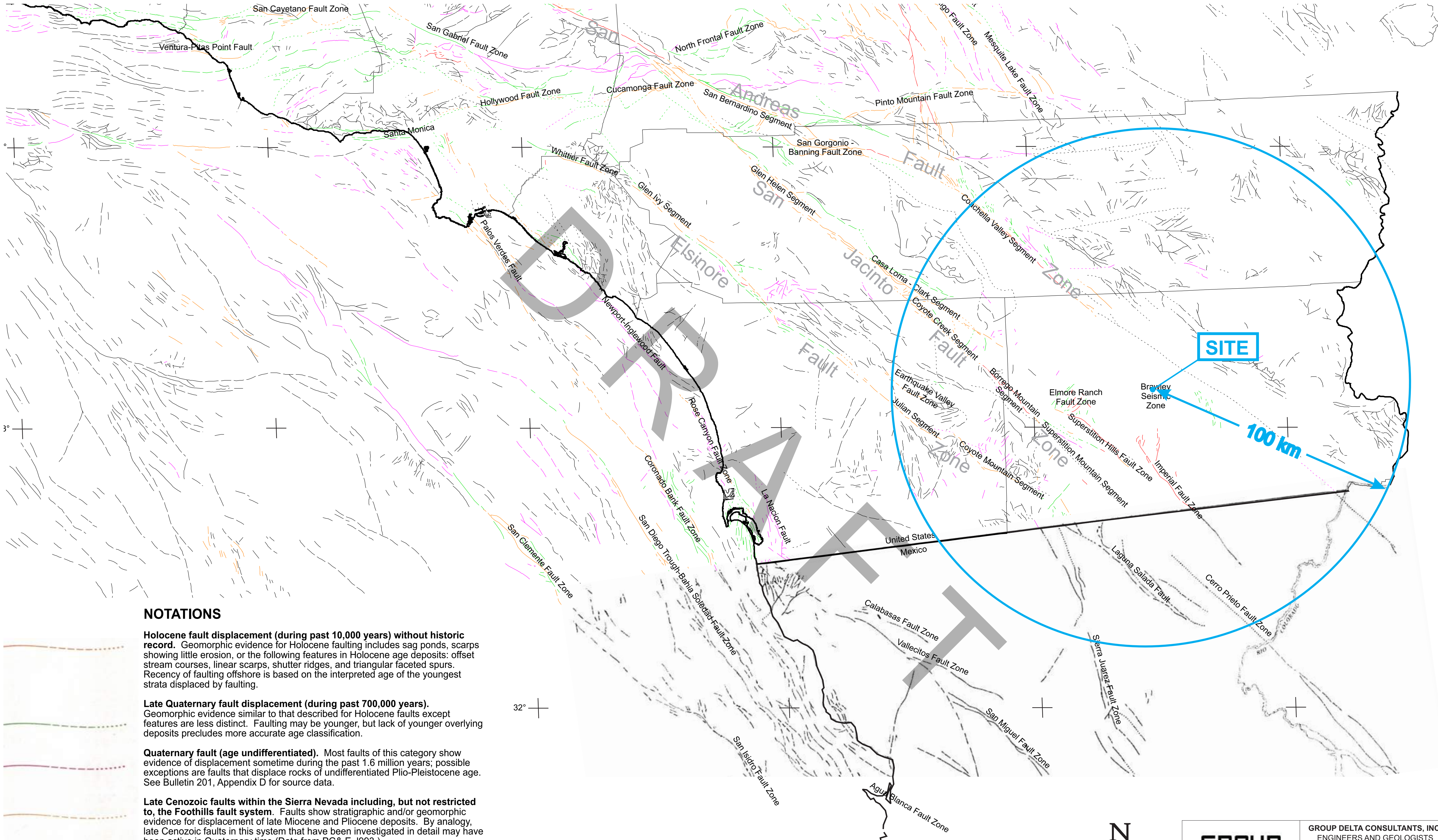

NOTATIONS

Holocene fault displacement (during past 10,000 years) without historic record. Geomorphic evidence for Holocene faulting includes sag ponds, scarps showing little erosion, or the following features in Holocene age deposits: offset stream courses, linear scarps, shutter ridges, and triangular faceted spurs. Recency of faulting offshore is based on the interpreted age of the youngest strata displaced by faulting.

Late Quaternary fault displacement (during past 700,000 years). Geomorphic evidence similar to that described for Holocene faults except features are less distinct. Faulting may be younger, but lack of younger overlying deposits precludes more accurate age classification.

Quaternary fault (age undifferentiated). Most faults of this category show evidence of displacement sometime during the past 1.6 million years; possible exceptions are faults that displace rocks of undifferentiated Plio-Pleistocene age. See Bulletin 201, Appendix D for source data.

Late Cenozoic faults within the Sierra Nevada including, but not restricted to, the Foothills fault system. Faults show stratigraphic and/or geomorphic evidence for displacement of late Miocene and Pliocene deposits. By analogy, late Cenozoic faults in this system that have been investigated in detail may have been active in Quaternary time (Data from PG&E, I993.)

Pre-Quaternary fault (older than 1.6 million years) or fault without recognized Quaternary displacement. Some faults are shown in this category because the source of mapping used was of reconnaissance nature, or was not done with the object of dating fault displacements. Faults in this category are not necessarily inactive.

Reference: Jennings, C.W. (1994). *Fault Activity Map of Callifornia and Adjacent Areas,* CDMG Geologic Data Series, Map No. 6.

N

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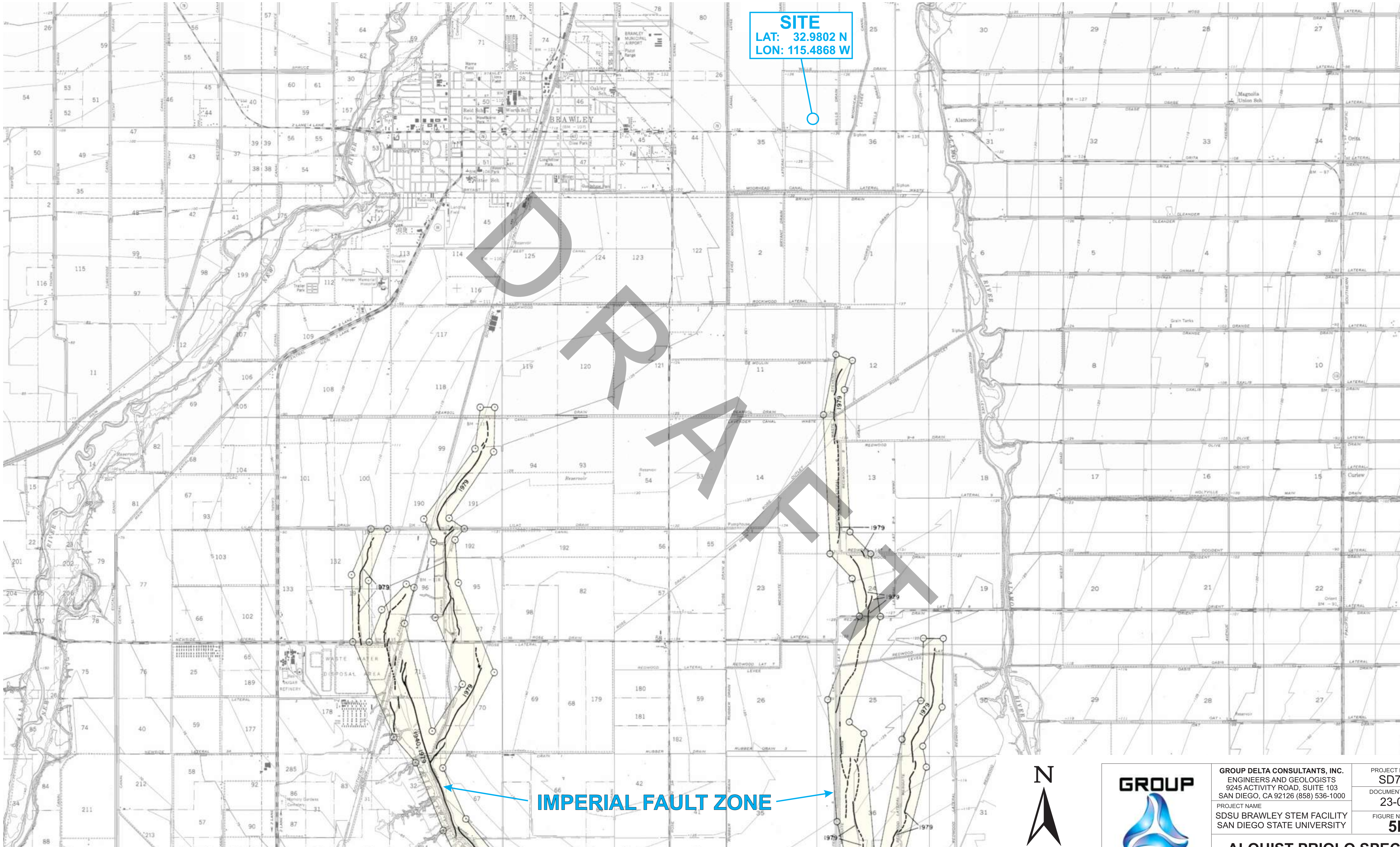
PROJECT NUMBER	SD725A
DOCUMENT NUMBER	23-0017
PROJECT NAME	SDSU BRAWLEY STEM FACILITY SAN DIEGO STATE UNIVERSITY
FIGURE NUMBER	5A

FAULT LOCATIONS



Reference: State of California (1990). *Alquist-Priolo Special Studies Zones, Brawley and Alamario Quadrangles,* Revised Official Map, January 1.

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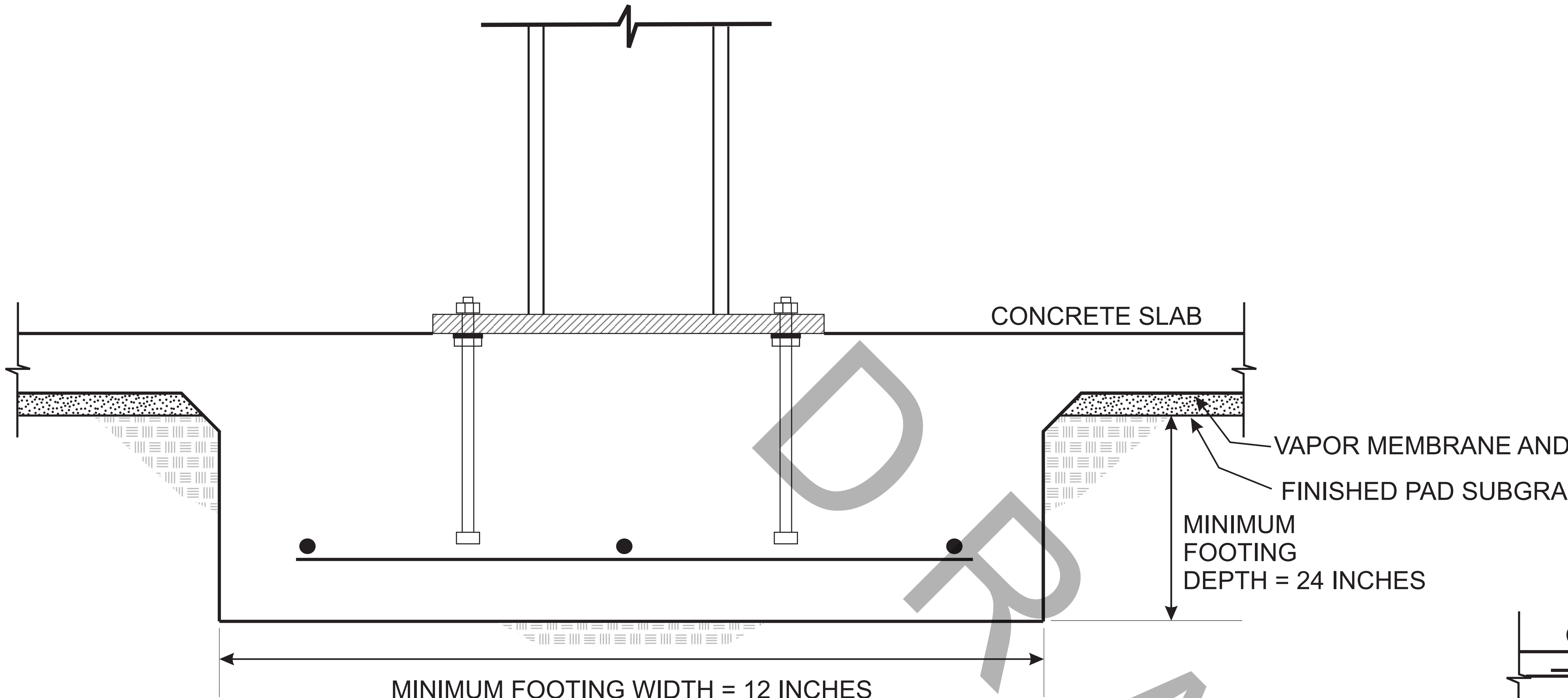
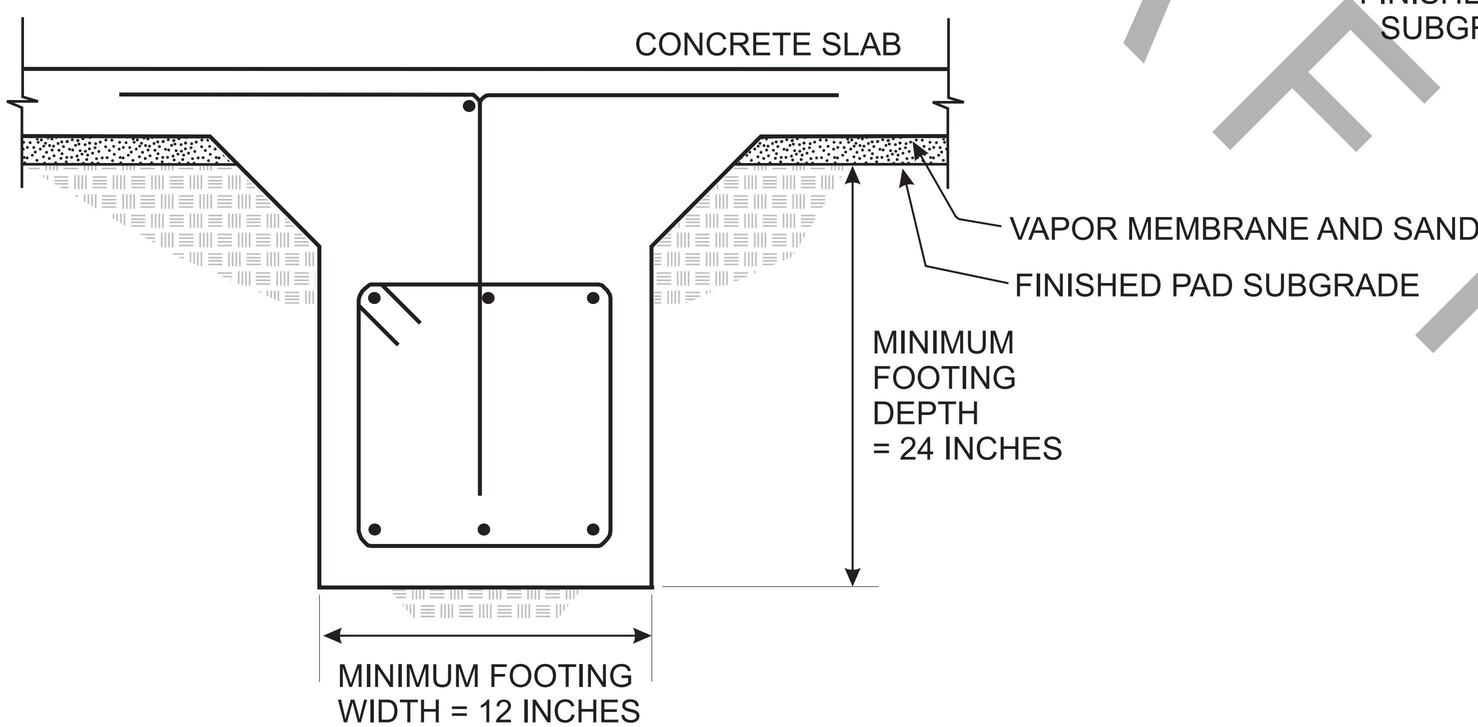
	DOCUMENT NUMBER 23-0017
PROJECT NAME SDSU BRAWLEY STEM FACILITY SAN DIEGO STATE UNIVERSITY	FIGURE NUMBER 5B

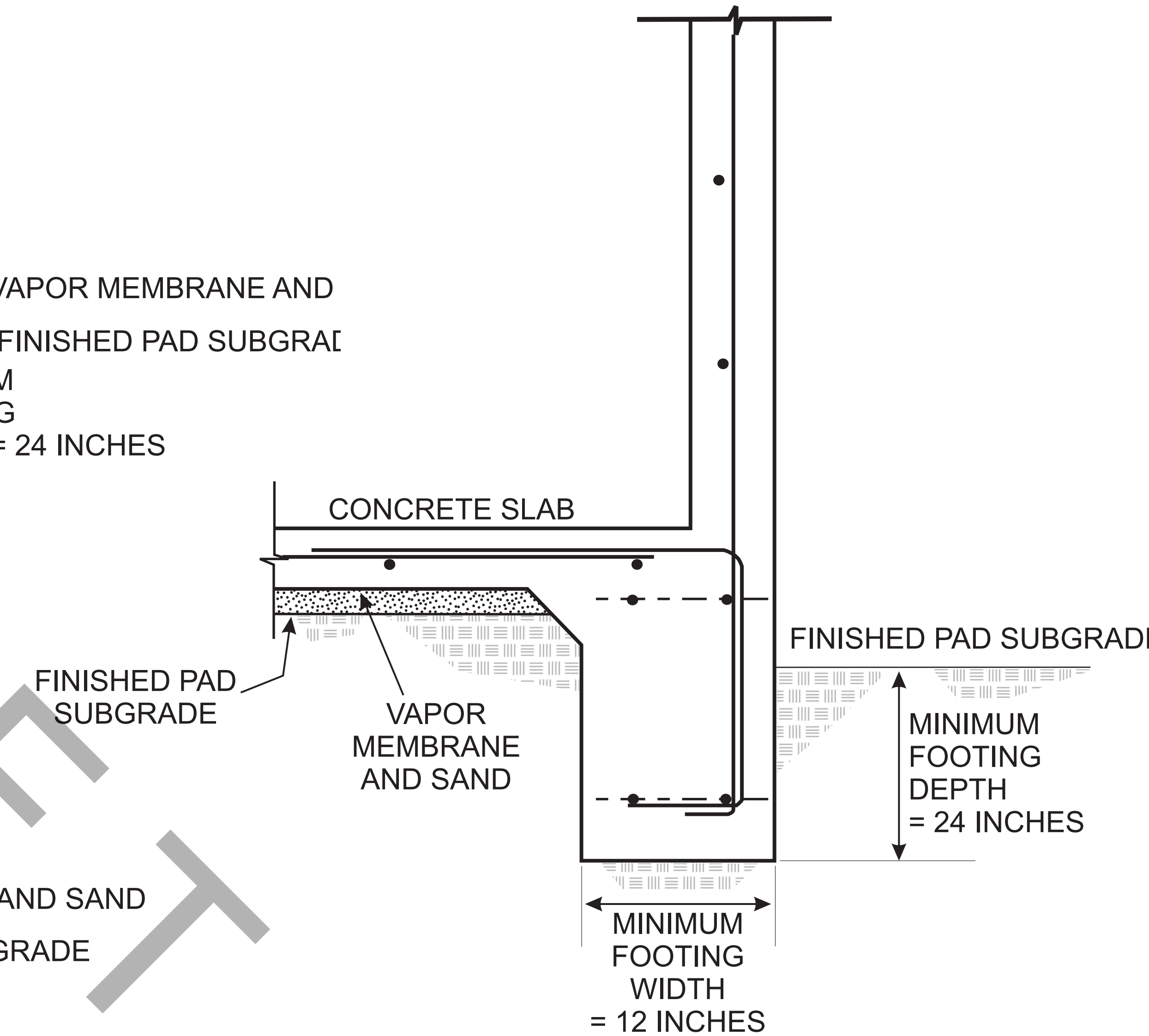
ALQUIST-PRIOLO SPECIAL STUDIES ZONES



SQUARE FOOTING



INTERIOR CONTINUOUS FOOTING

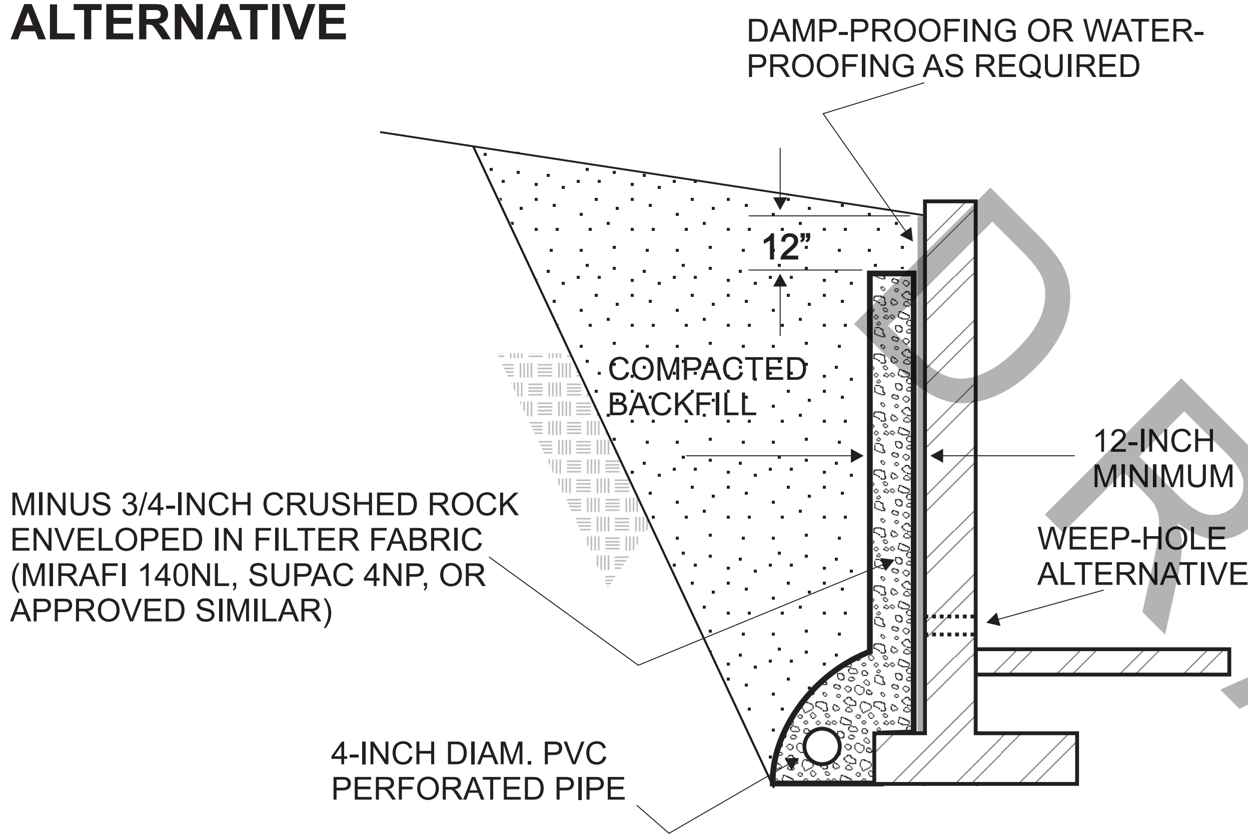


EXTERIOR CONTINUOUS FOOTING

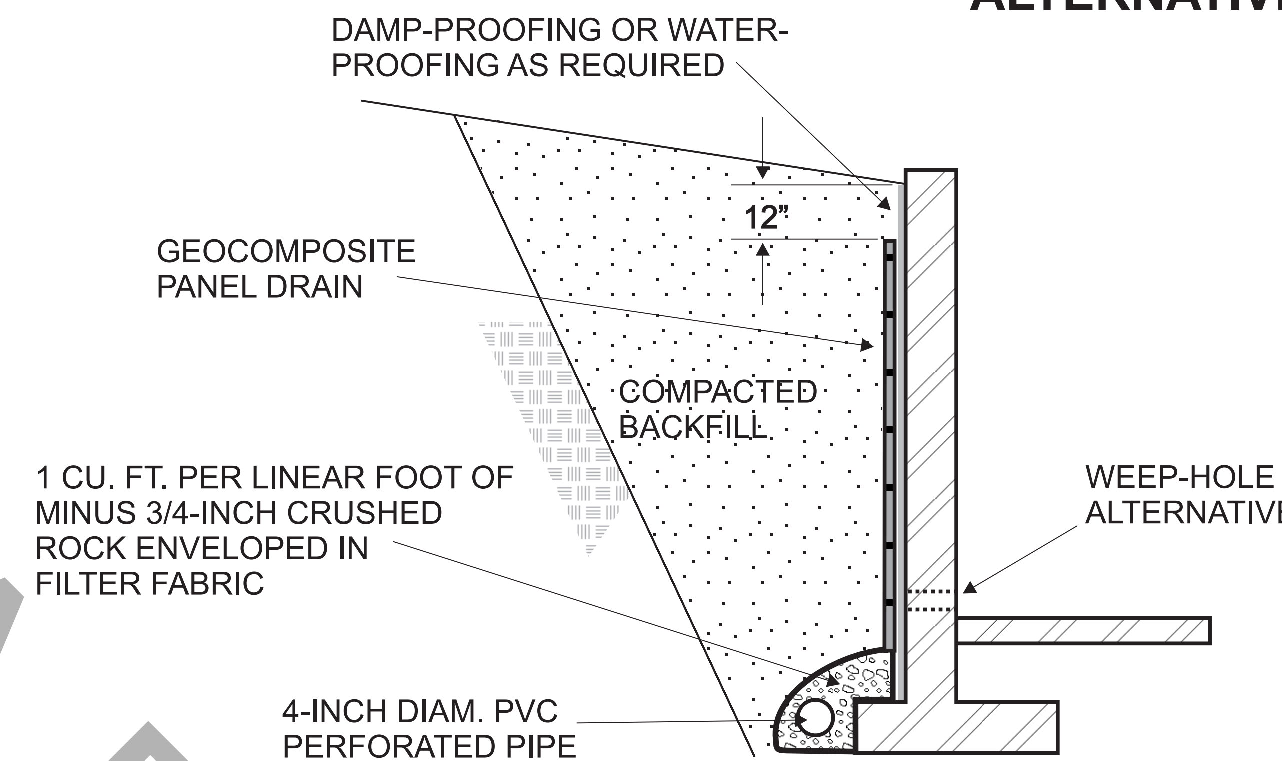
REINFORCEMENT SHOWN FOR ILLUSTRATION PURPOSES ONLY; NO SCALE.

GROUP DELTA	**GROUP DELTA CONSULTANTS, INC.** ENGINEERS AND GEOLOGISTS 9245 ACTIVITY ROAD, SUITE 103 SAN DIEGO, CA 92126 (858) 536-1000	PROJECT NUMBER SD725A
		DOCUMENT NUMBER 23-0017
	PROJECT NAME SDSU BRAWLEY STEM FACILITY SAN DIEGO STATE UNIVERSITY	FIGURE NUMBER 6
	SHALLOW FOUNDATIONS	

ROCK AND FABRIC ALTERNATIVE



PANEL DRAIN ALTERNATIVE



NOTES

1) Perforated pipe should outlet through a solid pipe to a free gravity outfall. Perforated pipe and outlet pipe should have a fall of at least 1%.

2) As an alternative to the perforated pipe and outlet, weep-holes may be constructed. Weep-holes should be at least 2 inches in diameter, spaced no greater than 8 feet, and be located just above grade at the bottom of wall.

3) Filter fabric should consist of Mirafi 140N, Supac 5NP, Amoco 4599, or similar approved fabric. Filter fabric should be overlapped at least 6-inches.

4) Geocomposite panel drain should consist of Miradrain 6000, J-DRain 400, Supac DS-15, or approved similar product.

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FIGURE NUMBER 7

WALL DRAINAGE DETAILS

APPENDIX A
EXPLORATION RECORDS

APPENDIX A

EXPLORATION RECORDS

Field exploration included a visual reconnaissance of the site, the drilling of three (3) hollow stem and mud rotary exploratory borings and the advancement of five (5) Cone Penetration Test (CPT) soundings on February 17, 2023. The maximum depth of exploration was approximately 85 feet below surrounding grades. A summary of the explorations is included in Table A-1. The approximate exploration locations are shown in Figure 2, Exploration Locations. Logs of the explorations are provided in Figures A-1 through A-10, immediately after the Boring Record Legends.

HOLLOW STEM AND MUD ROTARY BORINGS

The hollow stem and mud rotary exploratory borings were advanced by Tri-County Drilling using a CME 75 truck mounted drill rig. Disturbed samples were collected from the borings using a 2-inch outside diameter unlined Standard Penetration Test (SPT) sampler. Less disturbed samples were collected using a 3-inch outside diameter ring lined sampler (a modified California sampler). Bulk samples were also collected in the upper five feet of the boring. The samples were sealed in plastic bags, labeled, and returned to the laboratory for testing. A summary of the exploratory boring locations, elevations and depths is shown on the following page in Table A-1.

The drive samples were collected from the exploratory borings using an automatic hammer with average Energy Transfer Ratio (ETR) of approximately 82 percent. For each sample, the 6-inch incremental blowcounts were recorded on the logs. The field blow counts (N) were normalized to approximate the standard 60 percent ETR, as shown on the logs (N_{60}). The California ring samples were also corrected for the 3-inch sampler diameter using Burmister's correction factor.

The exploratory borings were logged using the Caltrans Soil and Rock Logging, Classification and Presentation Manual (2010) as a guideline.

CONE PENETRATION TESTS

The CPT soundings were advanced by Kehoe Testing and Engineering in general accordance with ASTM D5778. The CPT soundings were carried out using an integrated electronic cone system manufactured by Vertek. The soundings were advanced using a 30-ton truck-mounted CPT rig. The cone used during the program was a 15 centimeter squared (cm^2) cone and recorded the following parameters at approximately 2.5 centimeter depth intervals:

- Cone Resistance;
- Sleeve Friction;
- Dynamic Pore Pressure;

APPENDIX A

EXPLORATION RECORDS (Continued)

At location CPT-10, shear wave velocity measurements were obtained at five-foot intervals to a depth of approximately 85 feet, where CPT refusal was encountered due to flexure in the rods. The shear wave was generated using an air-actuated hammer placed under the CPT rig at a specified offset distance from the rods. The cone was equipped with a triaxial geophone, which recorded the shear wave signal generated by the air hammer. The above parameters were recorded and viewed in real time using a laptop computer. A summary of the collected shear wave measurements is presented in Figure A-9.

Note: The exploration locations were measured in the field using a Garmin GPSMAP 64st Global Positioning System (GPS) receiver and by visually estimating, pacing or taping distances from nearby landmarks, if available. The surface elevations were estimated using GoogleEarth Pro (Google, Inc., 2023). The locations and elevations provided should not be considered more accurate than is implied by the scale of the map and the accuracy of the equipment used to locate the explorations. The lines designating the interface between differing soil materials on the logs may be abrupt or gradational. Further, soil conditions at locations between the explorations may be substantially different from those at the specific locations we explored. The Boring Records are part of a geotechnical report which must be considered in its entirety.

Table A-1 – Explorations Summary (see Figure 2, Exploration Locations)

Exploration ID	Latitude [°]	Longitude [°]	Top Elevation MSL [1] [FT]	Exploration Depth [FT]	Bottom Elevation MSL [FT]	Figure No.
B-1	32.980090	115.487080	-132	21.5	-154	A-1
B-2	32.980220	115.486660	-134	21.5	-156	A-2
B-3	32.980170	115.486650	-136	51.5	-188	A-3
CPT-6	32.980180	115.487230	-135	50.5	-186	A-4
CPT-7	32.979930	115.486870	-133	50.4	-184	A-5
CPT-8	32.980070	115.486720	-133	50.7	-184	A-6
CPT-9	32.980180	115.486690	-134	51.7	-186	A-7
CPT-10	32.980420	115.486940	-136	85.2	-221	A-8

[1] GoogleEarth Pro (Google, Inc.) was used to estimate the top elevation of each exploration.

SOIL IDENTIFICATION AND DESCRIPTION SEQUENCE

Sequence	Identification Components	Refer to Section: Field	Refer to Section: Lab	Required	Optional
1	Group Name	2.5.2	3.2.2	●	
2	Group Symbol	2.5.2	3.2.2	●	
	Description Components				
3	Consistency of Cohesive Soil	2.5.3	3.2.3	●	
4	Apparent Density of Cohesionless Soil	2.5.4		●	
5	Color	2.5.5		●	
6	Moisture	2.5.6		●	
7	Percent or Proportion of Soil	2.5.7	3.2.4	●	⬬
	Particle Size	2.5.8	2.5.8	●	⬬
	Particle Angularity	2.5.9			○
	Particle Shape	2.5.10			○
8	Plasticity (for fine-grained soil)	2.5.11	3.2.5		○
9	Dry Strength (for fine-grained soil)	2.5.12			○
10	Dilatency (for fine-grained soil)	2.5.13			○
11	Toughness (for fine-grained soil)	2.5.14			○
12	Structure	2.5.15			○
13	Cementation	2.5.16		●	
14	Percent of Cobbles and Boulders	2.5.17		●	
	Description of Cobbles and Boulders	2.5.18		●	
15	Consistency Field Test Result	2.5.3		●	
16	Additional Comments	2.5.19			○

Describe the soil using descriptive terms in the order shown

Minimum Required Sequence:

USCS Group Name (Group Symbol); Consistency or Density; Color; Moisture; Percent or Proportion of Soil; Particle Size; Plasticity (optional).

⬬ = optional for non-Caltrans projects

Where applicable:

Cementation; % cobbles & boulders; Description of cobbles & boulders; Consistency field test result

REFERENCE: Caltrans Soil and Rock Logging, Classification, and Presentation Manual (2010).

HOLE IDENTIFICATION

Holes are identified using the following convention:

H – YY – NNN

Where:

H: Hole Type Code

YY: 2-digit year

NNN: 3-digit number (001-999)

Hole Type Code and Description

Hole Type Code	Description
A	Auger boring (hollow or solid stem, bucket)
R	Rotary drilled boring (conventional)
RC	Rotary core (self-cased wire-line, continuously-sampled)
RW	Rotary core (self-cased wire-line, not continuously sampled)
P	Rotary percussion boring (Air)
HD	Hand driven (1-inch soil tube)
HA	Hand auger
D	Driven (dynamic cone penetrometer)
CPT	Cone Penetration Test
O	Other (note on LOTB)

Description Sequence Examples:

SANDY lean CLAY (CL); very stiff; yellowish brown; moist; mostly fines; some SAND, from fine to medium; few gravels; medium plasticity; PP=2.75.

Well-graded SAND with SILT and GRAVEL and COBBLES (SW-SM); dense; brown; moist; mostly SAND, from fine to coarse; some fine GRAVEL; few fines; weak cementation; 10% GRANITE COBBLES; 3 to 6 inches; hard; subrounded.

Clayey SAND (SC); medium dense, light brown; wet; mostly fine sand,; little fines; low plasticity.

GROUP DELTA

PROJECT NO. SD725A

STEM FACILITY
SAN DIEGO STATE UNIVERSITY
BRAWLEY CAMPUS
BRAWLEY, CALIFORNIA

BORING RECORD LEGEND #1

GROUP SYMBOLS AND NAMES

Graphic / Symbol	Group Names
GW	Well-graded GRAVEL Well-graded GRAVEL with SAND
GP	Poorly graded GRAVEL Poorly graded GRAVEL with SAND
GW-GM	Well-graded GRAVEL with SILT Well-graded GRAVEL with SILT and SAND
GW-GC	Well-graded GRAVEL with CLAY (or SILTY CLAY) Well-graded GRAVEL with CLAY and SAND (or SILTY CLAY and SAND)
GP-GM	Poorly graded GRAVEL with SILT Poorly graded GRAVEL with SILT and SAND
GP-GC	Poorly graded GRAVEL with CLAY (or SILTY CLAY) Poorly graded GRAVEL with CLAY and SAND (or SILTY CLAY and SAND)
GM	SILTY GRAVEL SILTY GRAVEL with SAND
GC	CLAYEY GRAVEL CLAYEY GRAVEL with SAND
GC-GM	SILTY, CLAYEY GRAVEL SILTY, CLAYEY GRAVEL with SAND
SW	Well-graded SAND Well-graded SAND with GRAVEL
SP	Poorly graded SAND Poorly graded SAND with GRAVEL
SW-SM	Well-graded SAND with SILT Well-graded SAND with SILT and GRAVEL
SW-SC	Well-graded SAND with CLAY (or SILTY CLAY) Well-graded SAND with CLAY and GRAVEL (or SILTY CLAY and GRAVEL)
SP-SM	Poorly graded SAND with SILT Poorly graded SAND with SILT and GRAVEL
SP-SC	Poorly graded SAND with CLAY (or SILTY CLAY) Poorly graded SAND with CLAY and GRAVEL (or SILTY CLAY and GRAVEL)
SM	SILTY SAND SILTY SAND with GRAVEL
SC	CLAYEY SAND CLAYEY SAND with GRAVEL
SC-SM	SILTY, CLAYEY SAND SILTY, CLAYEY SAND with GRAVEL
PT	PEAT
	COBBLES COBBLES and BOULDERS BOULDERS

Graphic / Symbol	Group Names
CL	Lean CLAY Lean CLAY with SAND Lean CLAY with GRAVEL SANDY lean CLAY SANDY lean CLAY with GRAVEL GRAVELLY lean CLAY GRAVELLY lean CLAY with SAND
CL-ML	SILTY CLAY SILTY CLAY with SAND SILTY CLAY with GRAVEL SANDY SILTY CLAY SANDY SILTY CLAY with GRAVEL GRAVELLY SILTY CLAY GRAVELLY SILTY CLAY with SAND
ML	SILT SILT with SAND SILT with GRAVEL SANDY SILT SANDY SILT with GRAVEL GRAVELLY SILT GRAVELLY SILT with SAND
OL	ORGANIC lean CLAY ORGANIC lean CLAY with SAND ORGANIC lean CLAY with GRAVEL SANDY ORGANIC lean CLAY SANDY ORGANIC lean CLAY with GRAVEL GRAVELLY ORGANIC lean CLAY GRAVELLY ORGANIC lean CLAY with SAND
OL	ORGANIC SILT ORGANIC SILT with SAND ORGANIC SILT with GRAVEL SANDY ORGANIC SILT SANDY ORGANIC SILT with GRAVEL GRAVELLY ORGANIC SILT GRAVELLY ORGANIC SILT with SAND
CH	Fat CLAY Fat CLAY with SAND Fat CLAY with GRAVEL SANDY fat CLAY SANDY fat CLAY with GRAVEL GRAVELLY fat CLAY GRAVELLY fat CLAY with SAND
MH	Elastic SILT Elastic SILT with SAND Elastic SILT with GRAVEL SANDY elastic SILT SANDY elastic SILT with GRAVEL GRAVELLY elastic SILT GRAVELLY elastic SILT with SAND
OH	ORGANIC fat CLAY ORGANIC fat CLAY with SAND ORGANIC fat CLAY with GRAVEL SANDY ORGANIC fat CLAY SANDY ORGANIC fat CLAY with GRAVEL GRAVELLY ORGANIC fat CLAY GRAVELLY ORGANIC fat CLAY with SAND
OH	ORGANIC elastic SILT ORGANIC elastic SILT with SAND ORGANIC elastic SILT with GRAVEL SANDY elastic ELASTIC SILT SANDY ORGANIC elastic SILT with GRAVEL GRAVELLY ORGANIC elastic SILT GRAVELLY ORGANIC elastic SILT with SAND
OL/OH	ORGANIC SOIL ORGANIC SOIL with SAND ORGANIC SOIL with GRAVEL SANDY ORGANIC SOIL SANDY ORGANIC SOIL with GRAVEL GRAVELLY ORGANIC SOIL GRAVELLY ORGANIC SOIL with SAND

FIELD AND LABORATORY TESTING

C	Consolidation (ASTM D 2435)
CL	Collapse Potential (ASTM D 5333)
CP	Compaction Curve (CTM 216)
CR	Corrosion, Sulfates, Chlorides (CTM 643; CTM 417; CTM 422)
CU	Consolidated Undrained Triaxial (ASTM D 4767)
DS	Direct Shear (ASTM D 3080)
EI	Expansion Index (ASTM D 4829)
M	Moisture Content (ASTM D 2216)
OC	Organic Content (ASTM D 2974)
P	Permeability (CTM 220)
PA	Particle Size Analysis (ASTM D 422)
PI	Liquid Limit, Plastic Limit, Plasticity Index (AASHTO T 89, AASHTO T 90)
PL	Point Load Index (ASTM D 5731)
PM	Pressure Meter
R	R-Value (CTM 301)
SE	Sand Equivalent (CTM 217)
SG	Specific Gravity (AASHTO T 100)
SL	Shrinkage Limit (ASTM D 427)
SW	Swell Potential (ASTM D 4546)
UC	Unconfined Compression - Soil (ASTM D 2166) Unconfined Compression - Rock (ASTM D 2938)
UU	Unconsolidated Undrained Triaxial (ASTM D 2850)
UW	Unit Weight (ASTM D 2937)
WA	Percent passing the No. 200 Sieve (ASTM D 1140)

SAMPLER GRAPHIC SYMBOLS

Standard Penetration Test (SPT)

Standard California Sampler

Modified California Sampler (2.4" ID, 3" OD)

Shelby Tube

Piston Sampler

NX Rock Core

HQ Rock Core

Bulk Sample

Other (see remarks)

DRILLING METHOD SYMBOLS

Auger Drilling

Rotary Drilling

Dynamic Cone or Hand Driven

Diamond Core

WATER LEVEL SYMBOLS

First Water Level Reading (during drilling)

Static Water Level Reading (after drilling, date)

Definitions for Change in Material

Term	Definition	Symbol
Material Change	Change in material is observed in the sample or core and the location of change can be accurately located.	
Estimated Material Change	Change in material cannot be accurately located either because the change is gradational or because of limitations of the drilling and sampling methods.	
Soil / Rock Boundary	Material changes from soil characteristics to rock characteristics.	

REFERENCE: Caltrans Soil and Rock Logging, Classification, and Presentation Manual (2010).

GROUP DELTA

PROJECT NO. SD25A

STEM FACILITY
SAN DIEGO STATE UNIVERSITY
BRAWLEY CAMPUS
BRAWLEY, CALIFORNIA

BORING RECORD LEGEND #2

CONSISTENCY OF COHESIVE SOILS				
Description	Shear Strength (tsf)	Pocket Penetrometer, PP, Measurement (tsf)	Torvane, TV, Measurement (tsf)	Vane Shear, VS, Measurement (tsf)
Very Soft	Less than 0.12	Less than 0.25	Less than 0.12	Less than 0.12
Soft	0.12 - 0.25	0.25 - 0.5	0.12 - 0.25	0.12 - 0.25
Medium Stiff	0.25 - 0.5	0.5 - 1	0.25 - 0.5	0.25 - 0.5
Stiff	0.5 - 1	1 - 2	0.5 - 1	0.5 - 1
Very Stiff	1 - 2	2 - 4	1 - 2	1 - 2
Hard	Greater than 2	Greater than 4	Greater than 2	Greater than 2

APPARENT DENSITY OF COHESIONLESS SOILS	
Description	SPT N_{60} (blows / 12 inches)
Very Loose	0 - 5
Loose	5 - 10
Medium Dense	10 - 30
Dense	30 - 50
Very Dense	Greater than 50

MOISTURE	
Description	Criteria
Dry	No discernable moisture
Moist	Moisture present, but no free water
Wet	Visible free water

PERCENT OR PROPORTION OF SOILS	
Description	Criteria
Trace	Particles are present but estimated to be less than 5%
Few	5 - 10%
Little	15 - 25%
Some	30 - 45%
Mostly	50 - 100%

PARTICLE SIZE		
Description		Size (in)
Boulder		Greater than 12
Cobble		3 - 12
Gravel	Coarse	3/4 - 3
	Fine	1/5 - 3/4
Sand	Coarse	1/16 - 1/5
	Medium	1/64 - 1/16
	Fine	1/300 - 1/64
Silt and Clay		Less than 1/300

CEMENTATION	
Description	Criteria
Weak	Crumbles or breaks with handling or little finger pressure.
Moderate	Crumbles or breaks with considerable finger pressure.
Strong	Will not crumble or break with finger pressure.

REFERENCE: Caltrans Soil and Rock Logging, Classification, and Presentation Manual (2010), with the exception of consistency of cohesive soils vs. N_{60}.

Plasticity

Description	Criteria
Nonplastic	A 1/8-in. thread cannot be rolled at any water content.
Low	The thread can barely be rolled and the lump cannot be formed when drier than the plastic limit.
Medium	The thread is easy to roll and not much time is required to reach the plastic limit. The thread cannot be rerolled after reaching the plastic limit. The lump crumbles when drier than the plastic limit.
High	It takes considerable time rolling and kneading to reach the plastic limit. The thread can be rerolled several times after reaching the plastic limit. The lump can be formed without crumbling when drier than the plastic limit.

CONSISTENCY OF COHESIVE SOILS	
Description	SPT N_{60} (blows/12 inches)
Very Soft	0 - 2
Soft	2 - 4
Medium Stiff	4 - 8
Stiff	8 - 15
Very Stiff	15 - 30
Hard	Greater than 30

Ref: Peck, Hansen, and Thornburn, 1974, "Foundation Engineering," Second Edition.

Note: Only to be used (with caution) when pocket penetrometer or other data on undrained shear strength are unavailable. Not allowed by Caltrans Soil and Rock Logging and Classification Manual, 2010.

GROUP DELTA

PROJECT NO. SD725A

STEM FACILITY
SAN DIEGO STATE UNIVERSITY
BRAWLEY CAMPUS
BRAWLEY, CALIFORNIA

BORING RECORD LEGEND #3

BORING RECORD

PROJECT NAME	PROJECT NUMBER	BORING
SDSU Brawley STEM Facility	SD725A	**B-1**

SITE LOCATION	START	FINISH	SHEET NO.
560 CA-78, Brawley, California	2/17/2023	2/17/2023	1 of 1

DRILLING COMPANY	DRILLING METHOD	LOGGED BY	CHECKED BY
Tri-County Drilling	Hollow Stem Auger	D. Guzman	C. Vonk

DRILLING EQUIPMENT	BORING DIA. (in)	TOTAL DEPTH (ft)	GROUND ELEV (ft)	DEPTH/*ELEV.* GROUNDWATER (ft)
CME 75	8	21.5	-132	▼ NM / *na*

SAMPLING METHOD	NOTES
Hammer: 140 lbs., Drop: 30 in. (Automatic)	ETR ~ 82%, N_{60} = 1.36*N_{SPT} = 0.91*N_{MC}

DEPTH (feet)	ELEVATION (feet)	SAMPLE NO.	PENETRATION RESISTANCE (BLOWS / 6 IN)	BLOW/FT "N"	N_{60}	PID READINGS (ppm)	MOISTURE (%)	DRY DENSITY (pcf)	OTHER TESTS	DESCRIPTION AND CLASSIFICATION
0	-132									**FILL:** Fat CLAY (CH); moderate yellowish brown (10YR 5/4); moist; mostly fines; trace fine sand; high plasticity.
										LACUSTRINE DEPOSITS: Fat CLAY (CH); moderate yellowish brown (10YR 5/4); moist; mostly fines; trace fine sand; high plasticity.
	-135	B1					29.9		CR EI	
5		S2	4 5 8	13	18					Very stiff.
	-140	R3	4 5 9	14	13					Stiff clay; thinly interbedded with fine sand. PP = 1.25 tsf.
10										Lean CLAY (CL); stiff; moderate yellowish brown (10YR 5/4); wet; mostly fines; medium plasticity. (100% fines)
		SH4							WA PI UC C	
	-145									Fat CLAY (CH); medium stiff; medium yellowish brown (10YR 5/4); wet; mostly fines; trace fine sand; high plasticity. PP = 1.0 tsf.
15		S5	2 3 3	6	8					
	-150									SILTY SAND (SM); medium dense; dark yellowish orange (10YR 6/6); wet; mostly fine sand; some fines; nonplastic.
20		R6	8 12 11	23	21					
	-155									Total Depth = 21.5 feet (Target depth reached). Groundwater not measured - borehole caved shortly after drilling. Boring backfilled on 2/17/2023 shortly after drilling with bentonite chips and soil cuttings. This Boring Record is part of a geotechnical report which must be considered in its entirety. The exploration elevation was estimated using GoogleEarth Pro.

GROUP DELTA CONSULTANTS, INC.
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San Diego, California 92126

THIS SUMMARY APPLIES ONLY AT THE LOCATION OF THIS BORING AND AT THE TIME OF DRILLING. SUBSURFACE CONDITIONS MAY DIFFER AT OTHER LOCATIONS AND MAY CHANGE AT THIS LOCATION WITH THE PASSAGE OF TIME. THE DATA PRESENTED IS A SIMPLIFICATION OF THE ACTUAL CONDITIONS ENCOUNTERED.

FIGURE A-1

BORING RECORD

PROJECT NAME	PROJECT NUMBER	BORING
SDSU Brawley STEM Facility	SD725A	B-2

SITE LOCATION	START	FINISH	SHEET NO.
560 CA-78, Brawley, California	2/17/2023	2/17/2023	1 of 1

DRILLING COMPANY	DRILLING METHOD	LOGGED BY	CHECKED BY
Tri-County Drilling	Hollow Stem Auger	D. Guzman	C. Vonk

DRILLING EQUIPMENT	BORING DIA. (in)	TOTAL DEPTH (ft)	GROUND ELEV (ft)	DEPTH/*ELEV.* GROUNDWATER (ft)
CME 75	8	21.5	-134	▼ 10.2 / *-144.2*

SAMPLING METHOD	NOTES
Hammer: 140 lbs., Drop: 30 in. (Automatic)	ETR ~ 82%, N_{60} = 1.36*N_{SPT} = 0.91*N_{MC}

DEPTH (feet)	ELEVATION (feet)	SAMPLE TYPE	SAMPLE NO.	PENETRATION RESISTANCE (BLOWS / 6 IN)	BLOW/FT "N"	N_{60}	PID READINGS (ppm)	MOISTURE (%)	DRY DENSITY (pcf)	OTHER TESTS	DRILLING METHOD	GRAPHIC LOG	DESCRIPTION AND CLASSIFICATION
	-135												**FILL:** Fat CLAY (CH); moderate yellowish brown (10YR 5/4); moist; mostly fines; trace fine sand; high plasticity. (98% Fines; 2% Sand)
			B1					22.6		PA PI EI			**LACUSTRINE DEPOSITS:** Fat CLAY (CH); moderate yellowish brown (10YR 5/4); moist; mostly fines; trace sand; high plasticity.
5	-140		S2	3 5 6	11	15		27.9		PA PI			Very stiff; scattered caliche nodules. (100% Fines) PP = 3.25 tsf.
			R3	5 4 8	12	11		25.9	94	PA PI			Dark yellowish orange (10YR 6/6); moist to wet. (100% Fines) PP = 2.5 tsf.
10	-145		S4	2 3 5	8	11							Moderate yellowish brown (10YR 5/4); wet. PP = 3.75 tsf.
15	-150		SH5							WA PI UC C			Lean CLAY (CL); stiff; dark yellowish orange (10YR 6/6); wet; mostly fines; medium plasticity. (100% Fines)
20	-155		R6	4 15 22	37	34		23.4	103	PA			SILTY SAND (SM); dense; moderate yellowish brown (10YR 5/4); wet; some fines; mostly fine sand; nonplastic. (55% Sand; 45% Fines)

Total Depth = 21.5 feet. Groundwater measured at a depth of 10.2 feet approx. 3 hours after completion of drilling. Boring backfilled on 2/17/2023 shortly after drilling with bentonite chips and soil cuttings. This Boring Record is part of a geotechnical report which must be considered in its entirety. The exploration elevation was estimated using GoogleEarth Pro.

BORING RECORD

PROJECT NAME	PROJECT NUMBER	BORING
SDSU Brawley STEM Facility	SD725A	**B-3**

SITE LOCATION	START	FINISH	SHEET NO.
560 CA-78, Brawley, California	2/17/2023	2/17/2023	1 of 3

DRILLING COMPANY	DRILLING METHOD	LOGGED BY	CHECKED BY
Tri-County Drilling	Hollow Stem Auger / Rotary Wash	D. Guzman	C. Vonk

DRILLING EQUIPMENT	BORING DIA. (in)	TOTAL DEPTH (ft)	GROUND ELEV (ft)	DEPTH/*ELEV.* GROUNDWATER (ft)
CME 75	8 / 4	51.5	-136	▼ NM / *na*

SAMPLING METHOD	NOTES
Hammer: 140 lbs., Drop: 30 in. (Automatic)	ETR ~ 82%, N_{60} = 1.36*N_{SPT} = 0.91*N_{MC}

DEPTH (feet)	ELEVATION (feet)	SAMPLE TYPE	SAMPLE NO.	PENETRATION RESISTANCE (BLOWS / 6 IN)	BLOW/FT "N"	N_{60}	PID READINGS (ppm)	MOISTURE (%)	DRY DENSITY (pcf)	OTHER TESTS	DRILLING METHOD	GRAPHIC LOG	DESCRIPTION AND CLASSIFICATION
													FILL: Fat CLAY (CH); moderate yellowish brown (10YR 5/4); moist; mostly fines; trace fine sand; high plasticity.
													LACUSTRINE DEPOSITS: Fat CLAY (CH): moderate yellowish brown (10YR 5/4); moist; mostly fines; trace fine sand; high plasticity.
			B1					27.8		CR EI			
	-140												
5			R2	4 6 10	16	15		30.4	92				Very stiff. PP = 3.0 tsf.
	-145												
10			S3	1 2 3	5	7							Stiff; wet. PP = 1.75 tsf.
	-150												
15			R4	2 4 5	9	8							Medium stiff; medium to high plasticity.
	-155												
20			S5	5 8 13	21	29							
													SILTY SAND (SM); medium dense; moderate yellowish brown (10YR 5/4); wet; mostly fine sand; some fines; nonplastic.
	-160												

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FIGURE
A-3 a

BORING RECORD

PROJECT NAME	PROJECT NUMBER	BORING
SDSU Brawley STEM Facility	SD725A	B-3

SITE LOCATION	START	FINISH	SHEET NO.
560 CA-78, Brawley, California	2/17/2023	2/17/2023	2 of 3

DRILLING COMPANY	DRILLING METHOD	LOGGED BY	CHECKED BY
Tri-County Drilling	Hollow Stem Auger / Rotary Wash	D. Guzman	C. Vonk

DRILLING EQUIPMENT	BORING DIA. (in)	TOTAL DEPTH (ft)	GROUND ELEV (ft)	DEPTH/*ELEV.* GROUNDWATER (ft)
CME 75	8 / 4	51.5	-136	▼ NM / *na*

SAMPLING METHOD	NOTES
Hammer: 140 lbs., Drop: 30 in. (Automatic)	ETR ~ 82%, $N_{60} = 1.36 \cdot N_{SPT} = 0.91 \cdot N_{MC}$

DEPTH (feet)	ELEVATION (feet)	SAMPLE TYPE	SAMPLE NO.	PENETRATION RESISTANCE (BLOWS / 6 IN)	BLOW/FT "N"	N_{60}	PID READINGS (ppm)	MOISTURE (%)	DRY DENSITY (pcf)	OTHER TESTS	DRILLING METHOD	GRAPHIC LOG	DESCRIPTION AND CLASSIFICATION
			R6	6 15 16	31	28		23.7	102	PA			**LACUSTRINE DEPOSITS: (continued)** SILTY SAND (SM); medium dense; moderate yellowish brown (10YR 5/4); wet; mostly fine sand; some fines; nonplastic. (64% Sand; 36% Fines)
	-165												Fat CLAY (CH); stiff; moderate yellowish brown (10YR 5/4); wet; mostly fines; trace fine sand; high plasticity. (99% Fines)
30			SH7							WA PI C			
	-170												
35			S8	5 5 8	13	18							PP = 1.25 tsf.
	-175												Medium to high plasticity. PP = 1.75 tsf.
40			R9-1 R9-2	8 11 12	23	21		26.5	98	WA			SILT (ML); stiff; moderate yellowish brown (10YR 5/4); wet; mostly fines; some fine sand; low plasticity. (99% Fines)
	-180												Lean CLAY (CL); stiff; moderate yellowish brown (10YR 5/4); wet; mostly fines; trace fine sand; medium plasticity. (100% Fines)
45			S10	2 3 5	8	11				WA			
	-185												(See description on following page)

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San Diego, California 92126

THIS SUMMARY APPLIES ONLY AT THE LOCATION OF THIS BORING AND AT THE TIME OF DRILLING. SUBSURFACE CONDITIONS MAY DIFFER AT OTHER LOCATIONS AND MAY CHANGE AT THIS LOCATION WITH THE PASSAGE OF TIME. THE DATA PRESENTED IS A SIMPLIFICATION OF THE ACTUAL CONDITIONS ENCOUNTERED.

BORING RECORD

PROJECT NAME	PROJECT NUMBER	BORING
SDSU Brawley STEM Facility	SD725A	**B-3**

SITE LOCATION	START	FINISH	SHEET NO.
560 CA-78, Brawley, California	2/17/2023	2/17/2023	3 of 3

DRILLING COMPANY	DRILLING METHOD	LOGGED BY	CHECKED BY
Tri-County Drilling	Hollow Stem Auger / Rotary Wash	D. Guzman	C. Vonk

DRILLING EQUIPMENT	BORING DIA. (in)	TOTAL DEPTH (ft)	GROUND ELEV (ft)	DEPTH/*ELEV.* GROUNDWATER (ft)
CME 75	8 / 4	51.5	-136	▼ NM / *na*

SAMPLING METHOD	NOTES
Hammer: 140 lbs., Drop: 30 in. (Automatic)	ETR ~ 82%, N_{60} = 1.36*N_{SPT} = 0.91*N_{MC}

DEPTH (feet)	ELEVATION (feet)	SAMPLE TYPE	SAMPLE NO.	PENETRATION RESISTANCE (BLOWS / 6 IN)	BLOW/FT "N"	N_{60}	PID READINGS (ppm)	MOISTURE (%)	DRY DENSITY (pcf)	OTHER TESTS	DRILLING METHOD	GRAPHIC LOG	DESCRIPTION AND CLASSIFICATION
			R11	6 9 21	30	27		26.7	98				**<u>LACUSTRINE DEPOSITS: (continued)</u>** SILTY CLAY (CL-ML); stiff; moderate yellowish brown (10YR 5/4); mostly fines; little fine sand; low to medium plasticity.
													Total Depth = 51.5 feet (Target depth reached).
													Groundwater not measured due to use of mud rotary drilling method.
	-190												Boring backfilled on 2/17/2023 shortly after drilling with bentonite chips and cement grout.
55													This Boring Record is part of a geotechnical report which must be considered in its entirety.
													The exploration elevation was estimated using GoogleEarth Pro.
	-195												
60													
	-200												
65													
	-205												
70													
	-210												

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San Diego, California 92126

Group Delta Consultants, Inc.
9245 Activity Road, Suite 103
San Diego, California 92126
www.GroupDelta.com

Project: Project No. SD760, SDSU Brawley STEM Facility

Location: 560 CA-78, Brawley, California

CPT-6

Total depth: 50.54 ft

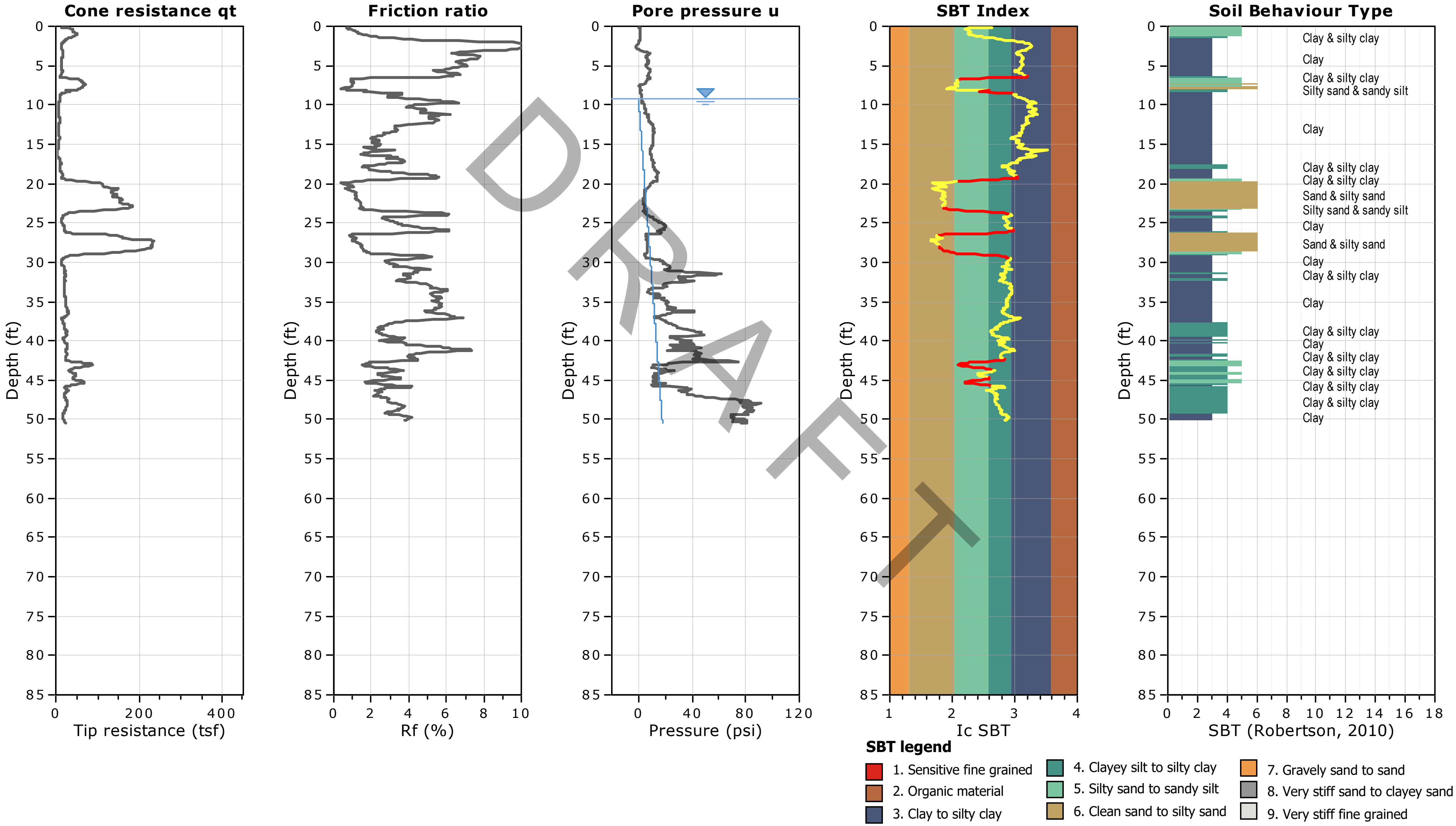

FIGURE A-4

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San Diego, California 92126
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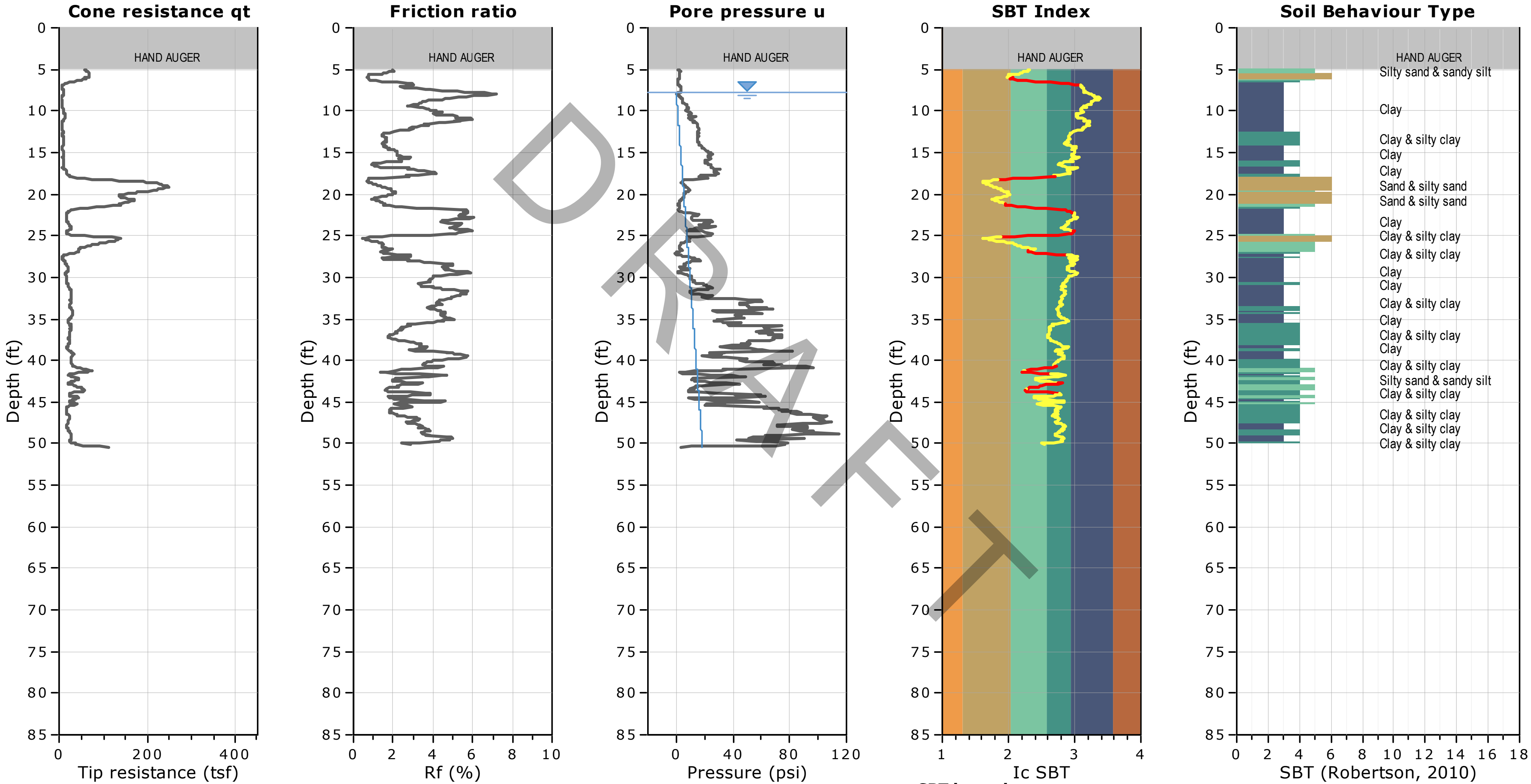
Project: **Project No. SD760, SDSU Brawley STEM Facility**

Location: **560 CA-78, Brawley, California**

CPT-7

Total depth: 50.41 ft



SBT legend

1. Sensitive fine grained
2. Organic material
3. Clay to silty clay
4. Clayey silt to silty clay
5. Silty sand to sandy silt
6. Clean sand to silty sand
7. Gravely sand to sand
8. Very stiff sand to clayey sand
9. Very stiff fine grained

FIGURE A-5

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San Diego, California 92126
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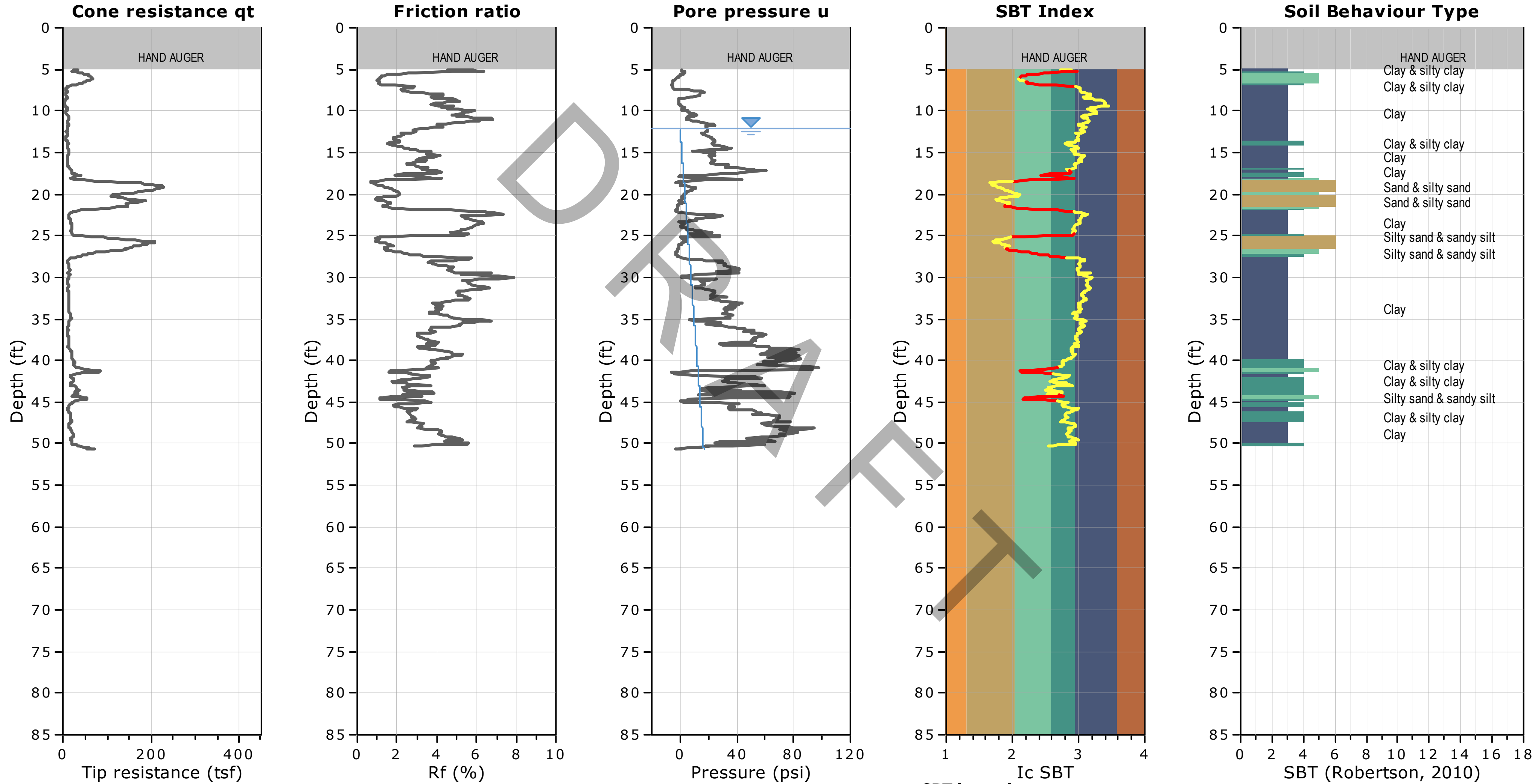
Project: **Project No. SD760, SDSU Brawley STEM Facility**
Location: **560 CA-78, Brawley, California**

CPT-8
Total depth: 50.72 ft



SBT legend

1. Sensitive fine grained
2. Organic material
3. Clay to silty clay
4. Clayey silt to silty clay
5. Silty sand to sandy silt
6. Clean sand to silty sand
7. Gravely sand to sand
8. Very stiff sand to clayey sand
9. Very stiff fine grained

FIGURE A-6

Group Delta Consultants, Inc.
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San Diego, California 92126
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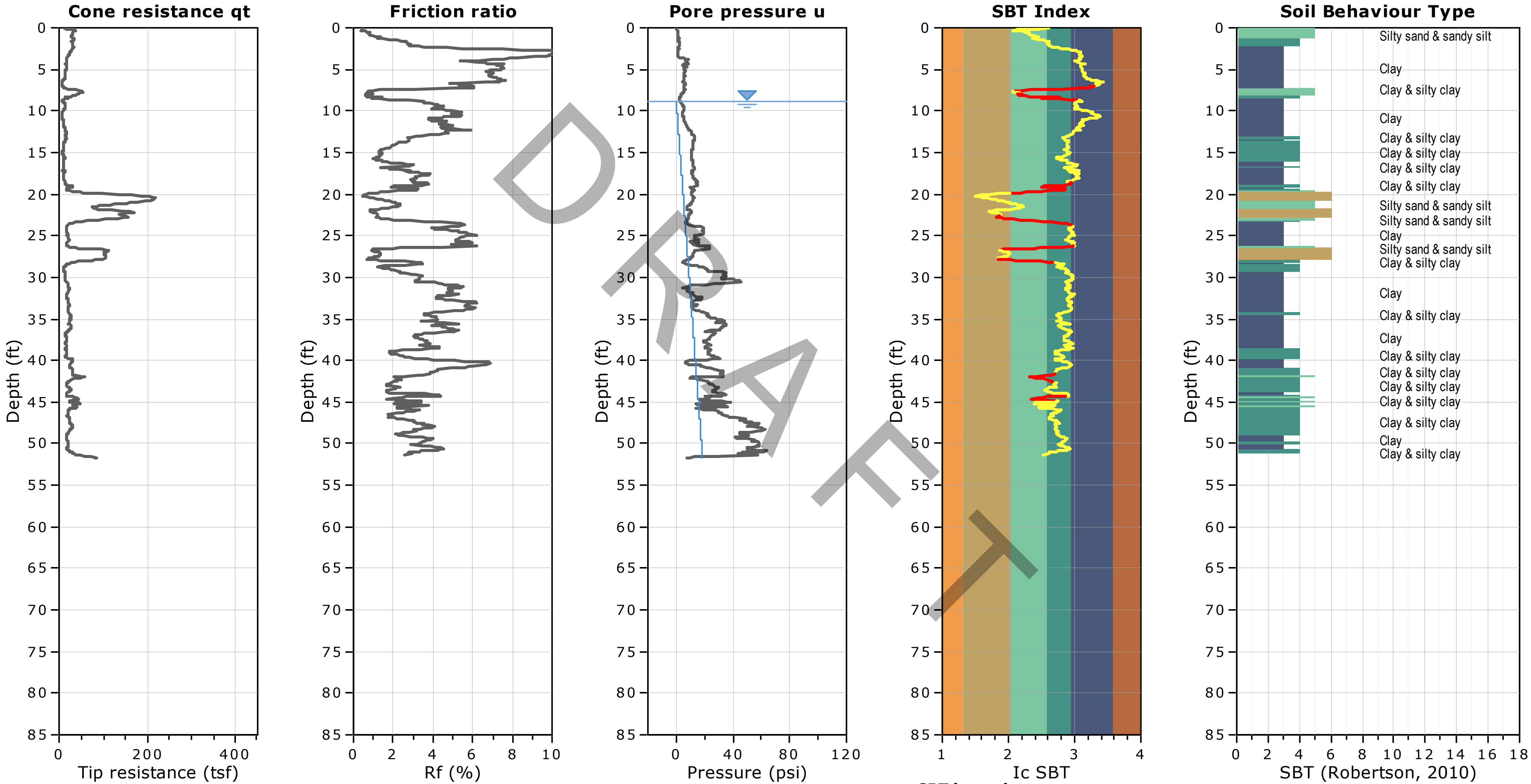
Project: **Project No. SD760, SDSU Brawley STEM Facility**
Location: **560 CA-78, Brawley, California**

CPT-9
Total depth: 51.72 ft



SBT legend

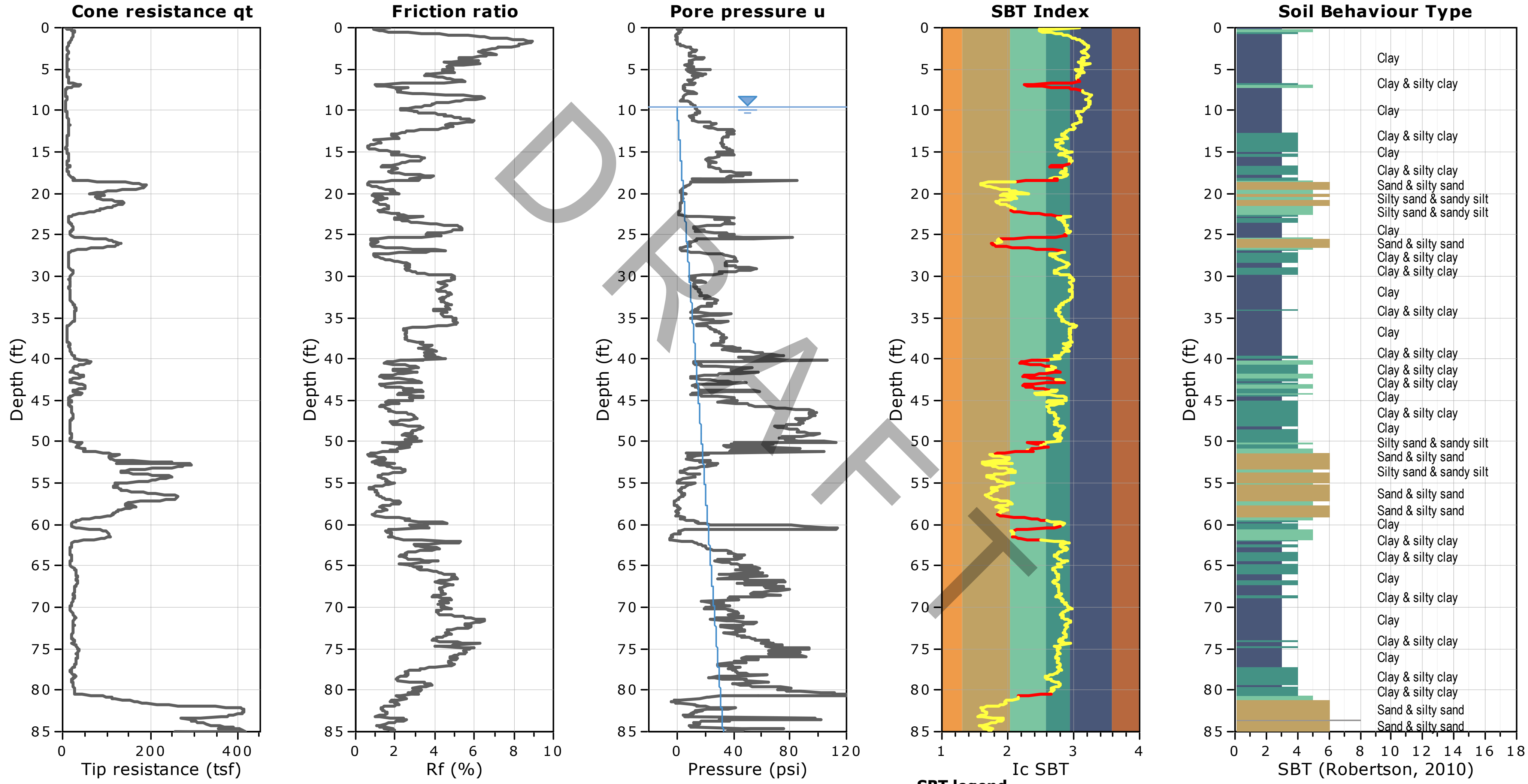
1. Sensitive fine grained
2. Organic material
3. Clay to silty clay
4. Clayey silt to silty clay
5. Silty sand to sandy silt
6. Clean sand to silty sand
7. Gravely sand to sand
8. Very stiff sand to clayey sand
9. Very stiff fine grained

FIGURE A-7

Group Delta Consultants, Inc.
9245 Activity Road, Suite 103
San Diego, California 92126
www.GroupDelta.com

Project: Project No. SD760, SDSU Brawley STEM Facility
Location: 560 CA-78, Brawley, California

CPT-10
Total depth: 85.24 ft



SBT legend

1. Sensitive fine grained
2. Organic material
3. Clay to silty clay
4. Clayey silt to silty clay
5. Silty sand to sandy silt
6. Clean sand to silty sand
7. Gravely sand to sand
8. Very stiff sand to clayey sand
9. Very stiff fine grained

FIGURE A-8

Project No. SD760, SDSU Brawley STEM Facility
560 CA-78, Brawley, California

CPT Shear Wave Velocity Measurements

Location	Tip Depth (ft)	Geophone Depth (ft)	Travel Distance (ft)	S-Wave Arrival (msec)	S-Wave Velocity from Surface (ft/sec)	Interval S-Wave Velocity (ft/sec)
CPT-10	5.05	4.05	4.52	10.70	422	
	10.07	9.07	9.29	20.64	450	480
	15.03	14.03	14.17	34.92	406	342
	20.01	19.01	19.11	44.30	431	527
	25.03	24.03	24.11	51.60	467	685
	29.99	28.99	29.06	61.32	474	509
	35.04	34.04	34.10	72.88	468	436
	40.06	39.06	39.11	81.24	481	600
	45.01	44.01	44.06	88.20	499	710
	50.00	49.00	49.04	96.66	507	589
	55.02	54.02	54.06	103.30	523	755
	60.01	59.01	59.04	109.00	542	875
	65.06	64.06	64.09	116.80	549	647
	70.01	69.01	69.04	124.20	556	669
	75.03	74.03	74.06	131.24	564	713
	80.02	79.02	79.05	138.32	571	705
	85.01	84.01	84.03	142.60	589	1166

Shear Wave Source Offset - 2 ft

S-Wave Velocity from Surface = Travel Distance/S-Wave Arrival
Interval S-Wave Velocity = (Travel Dist2-Travel Dist1)/(Time2-Time1)

FIGURE A-9

APPENDIX B
LABORATORY TESTING

APPENDIX B

LABORATORY TESTING

Laboratory testing was conducted in a manner consistent with the level of care and skill ordinarily exercised by members of the profession currently practicing under similar conditions and in the same locality. No warranty, express or implied, is made as to the correctness or serviceability of the test results, or the conclusions derived from these tests. Where a specific laboratory test method has been referenced, such as ASTM or Caltrans, the reference only applies to the specified laboratory test method, which has been used only as a guidance document for the general performance of the test and not as a "Test Standard". A brief description of the tests follows.

Classification: Soils were visually classified according to the Unified Soil Classification System as established by the American Society of Civil Engineers per ASTM D2487. The soil classifications are shown on the boring logs in Appendix A.

Particle Size Analysis: Particle size analyses were performed in general accordance with ASTM D6913 and D1140 and were used to supplement visual classifications. The test results are summarized on the Boring Records in Appendix A and are presented in detail in Figures B-1 through B-2.

Atterberg Limits: ASTM D4318 was used to determine the liquid and plastic limits, and plasticity index of selected soil samples. The test results are presented with the associated gradation analyses in Figures B-1.1 through B-1.5 and are also summarized in Figure B-3.

Expansion Index: The expansion potential of selected soil samples was estimated in general accordance with ASTM D4829. The test results are summarized in Figure B-4. Figure B-4 also presents common criteria for evaluating the expansion potential based on the expansion index.

pH and Resistivity: To assess the potential for reactivity with buried metals, selected soil samples were tested for pH and minimum resistivity using Caltrans test method 643. The corrosivity test results are summarized in Figure B-5.

Sulfate Content: To assess the potential for reactivity with concrete, selected soil samples were tested for water soluble sulfate. The sulfate was extracted from the soil under vacuum using a 10:1 (water to dry soil) dilution ratio. The extracted solution was tested for water soluble sulfate in general accordance with ASTM D516. The test results are also presented in Figure B-5, along with common criteria for evaluating soluble sulfate content.

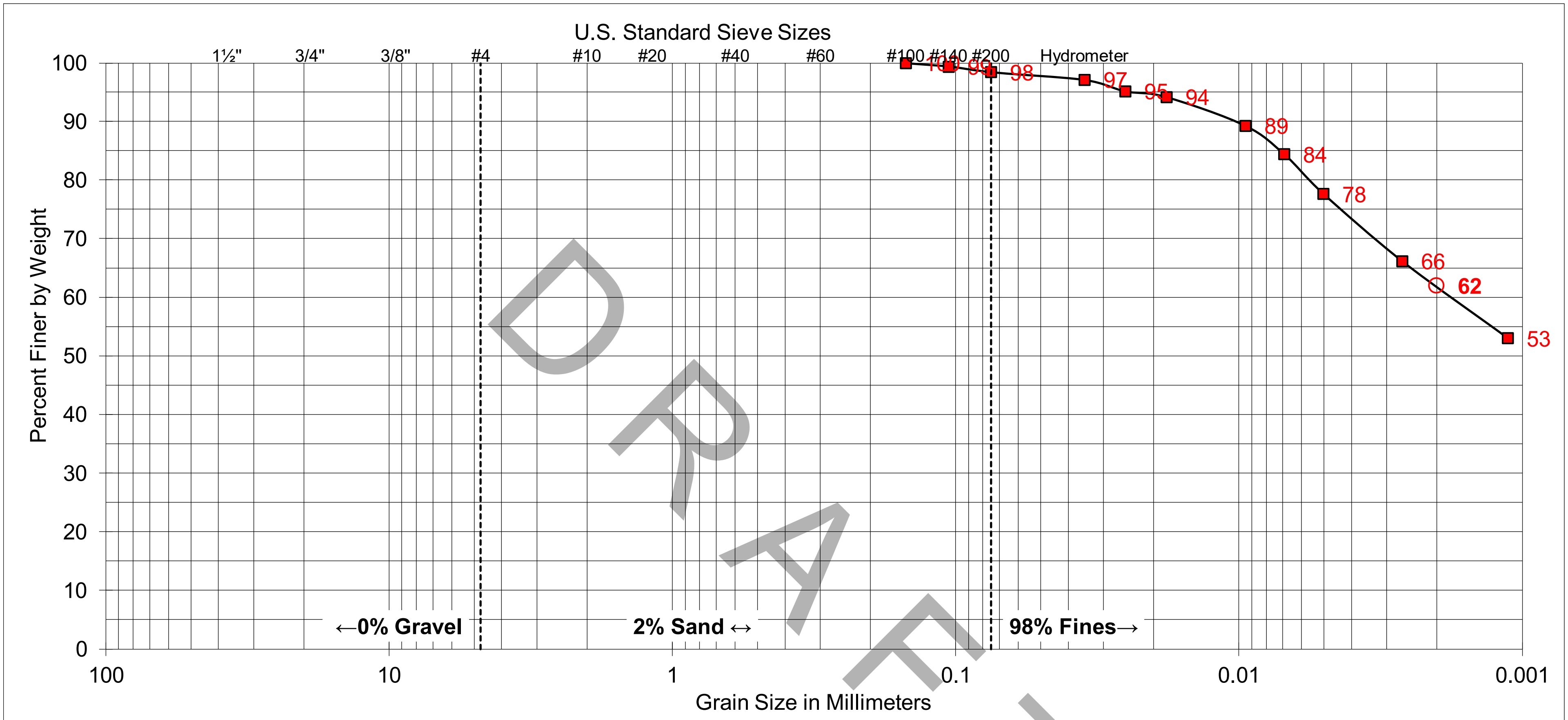
Chloride Content: Soil samples were also tested for water soluble chloride. The chloride was extracted from the soil under vacuum using a 10:1 (water to dry soil) dilution ratio. The extracted solution was then tested for water soluble chloride using a calibrated ion specific electronic probe in general accordance with ASTM D512. The test results are also shown in Figure B-5.

APPENDIX B

LABORATORY TESTING (Continued)

Unconfined Compressive Strength: The undrained shear strength of two selected soil samples were assessed using unconfined compression testing performed in general accordance with ASTM D2166. The test results are presented in Figure B-6.1 and B-6.2. The Pocket Penetration tests conducted on clayey samples during the field investigation are shown in the Boring Records in Appendix A.

Consolidation: The one-dimensional consolidation properties of the selected samples were evaluated in general accordance with ASTM D2435. The samples were inundated with water under a nominal seating load, allowed to swell, and then subjected to controlled stress increments while restrained laterally and drained axially. The test results are presented in Figure B-7.1 through B-7.3.



COARSE	FINE	COARSE	MEDIUM	FINE	SILT AND
GRAVEL		SAND			CLAY

SAMPLE	
EXPLORATION ID:	B-2
SAMPLE DEPTH:	0 - 5'

UNIFIED SOIL CLASSIFICATION: CH

DESCRIPTION: FAT CLAY

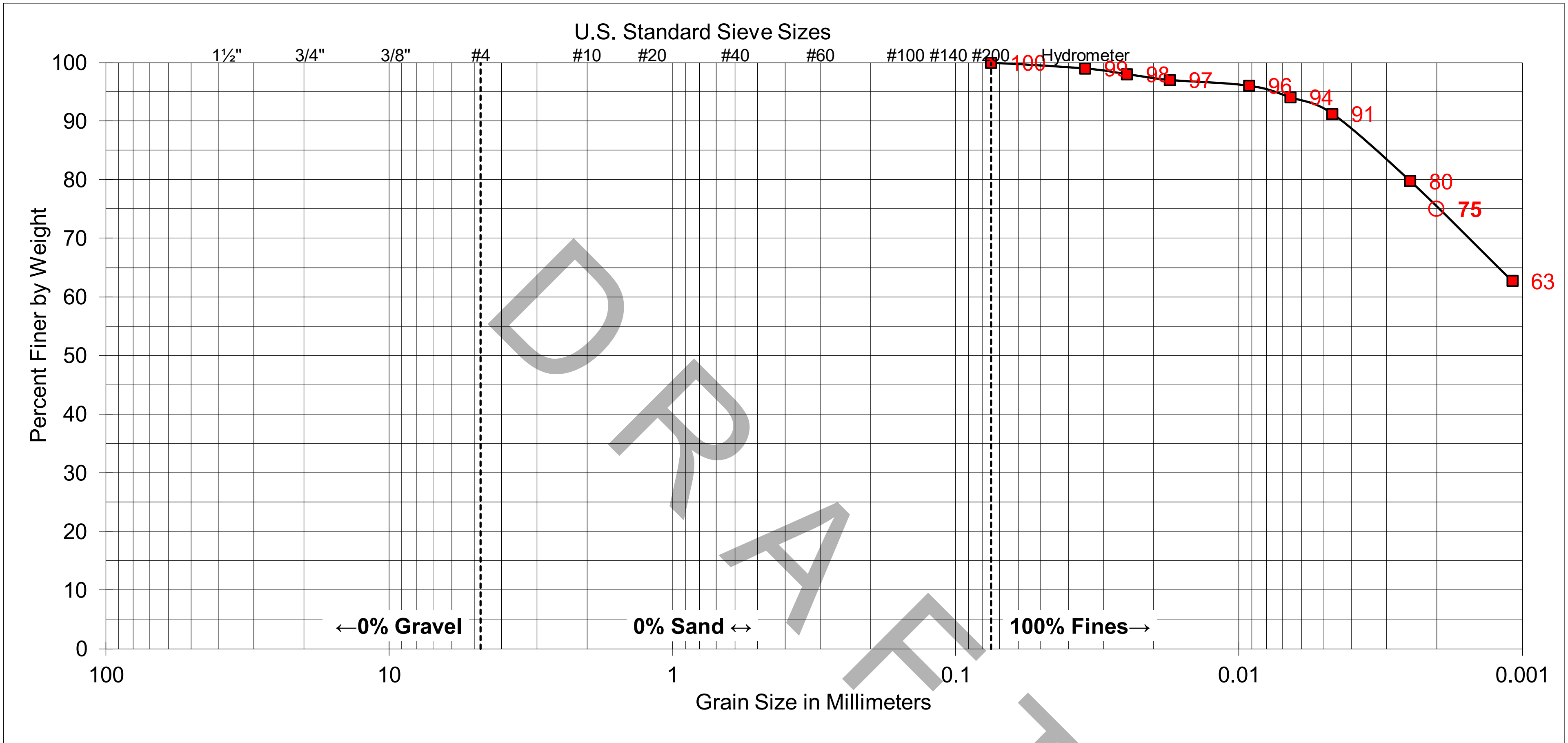
ATTERBERG LIMITS	
LIQUID LIMIT:	67
PLASTIC LIMIT:	23
PLASTICITY INDEX:	44

GROUP DELTA

SOIL CLASSIFICATION

Project No. SD725A

FIGURE B-1.1



COARSE	FINE	COARSE	MEDIUM	FINE	SILT AND
GRAVEL		SAND			CLAY

SAMPLE	
EXPLORATION ID:	B-2
SAMPLE DEPTH:	5' - 6.5'

UNIFIED SOIL CLASSIFICATION: CH

DESCRIPTION: FAT CLAY

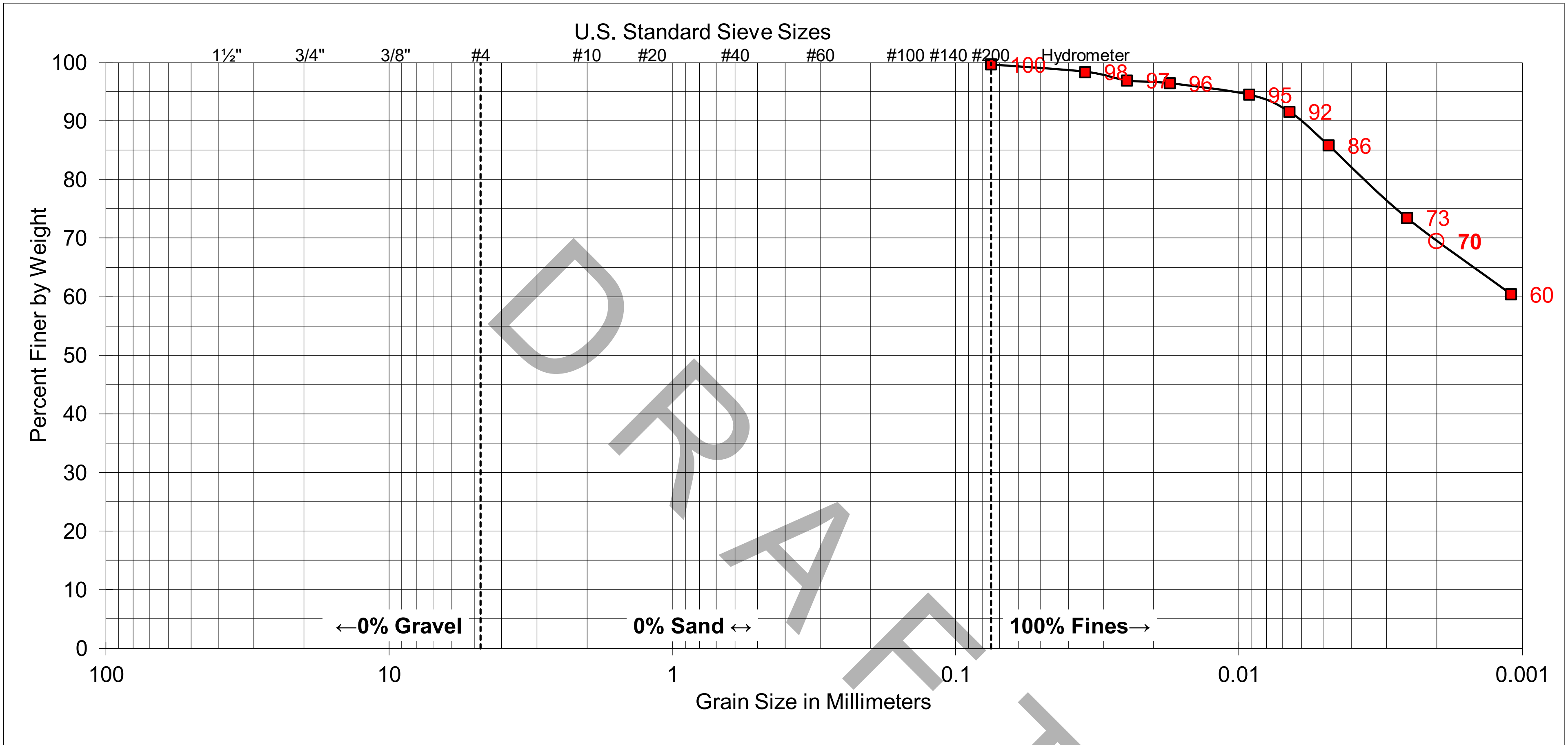
ATTERBERG LIMITS	
LIQUID LIMIT:	78
PLASTIC LIMIT:	26
PLASTICITY INDEX:	52

GROUP DELTA

SOIL CLASSIFICATION

Project No. SD725A

FIGURE B-1.2



COARSE	FINE	COARSE	MEDIUM	FINE	SILT AND
GRAVEL		SAND			CLAY

SAMPLE	
EXPLORATION ID:	B-2
SAMPLE DEPTH:	7.5' - 9'

UNIFIED SOIL CLASSIFICATION: CH

DESCRIPTION: FAT CLAY

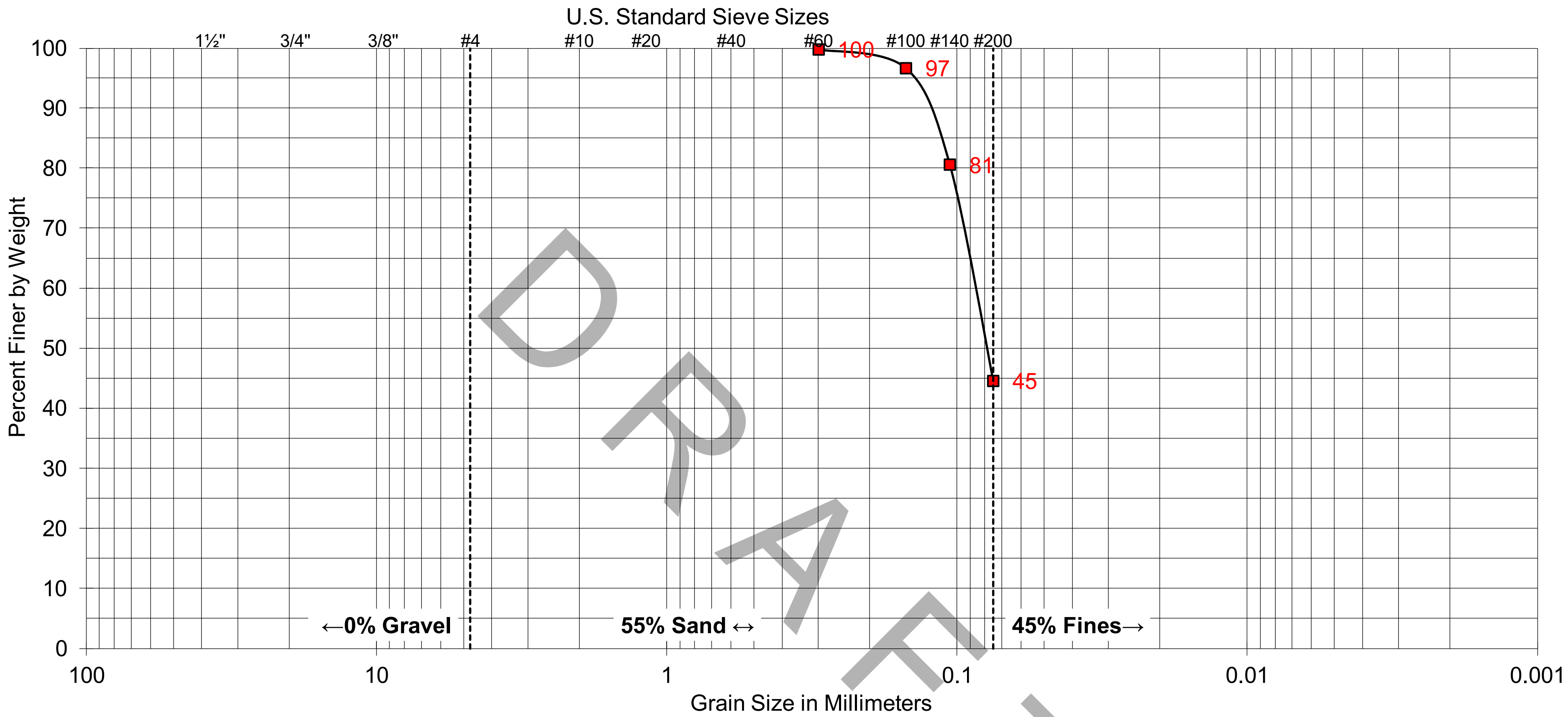
ATTERBERG LIMITS	
LIQUID LIMIT:	72
PLASTIC LIMIT:	26
PLASTICITY INDEX:	46

GROUP DELTA

SOIL CLASSIFICATION

Project No. SD725A

FIGURE B-1.3



COARSE	FINE	COARSE	MEDIUM	FINE	SILT AND
GRAVEL		SAND			CLAY

SAMPLE	
EXPLORATION ID:	B-2
SAMPLE DEPTH:	20' - 21.5'

UNIFIED SOIL CLASSIFICATION: SM

DESCRIPTION: SILTY SAND

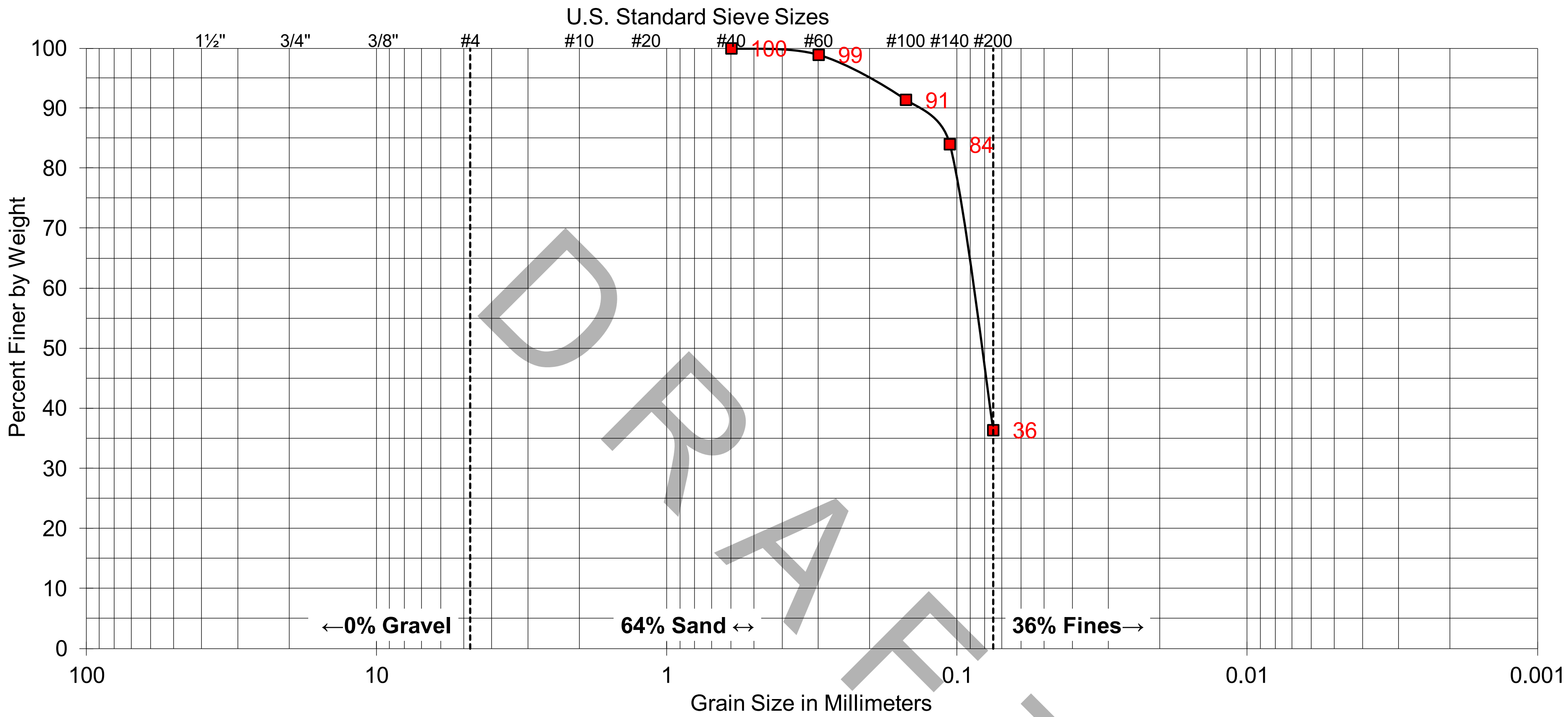
ATTERBERG LIMITS	
LIQUID LIMIT:	--
PLASTIC LIMIT:	--
PLASTICITY INDEX:	--

GROUP DELTA

SOIL CLASSIFICATION

Project No. SD725A

FIGURE B-1.4



COARSE	FINE	COARSE	MEDIUM	FINE	SILT AND
GRAVEL		SAND			CLAY

SAMPLE	
EXPLORATION ID:	B-3
SAMPLE DEPTH:	25 - 26.5'

UNIFIED SOIL CLASSIFICATION: SM

DESCRIPTION: SILTY SAND

ATTERBERG LIMITS	
LIQUID LIMIT:	--
PLASTIC LIMIT:	--
PLASTICITY INDEX:	--

GROUP DELTA

SOIL CLASSIFICATION

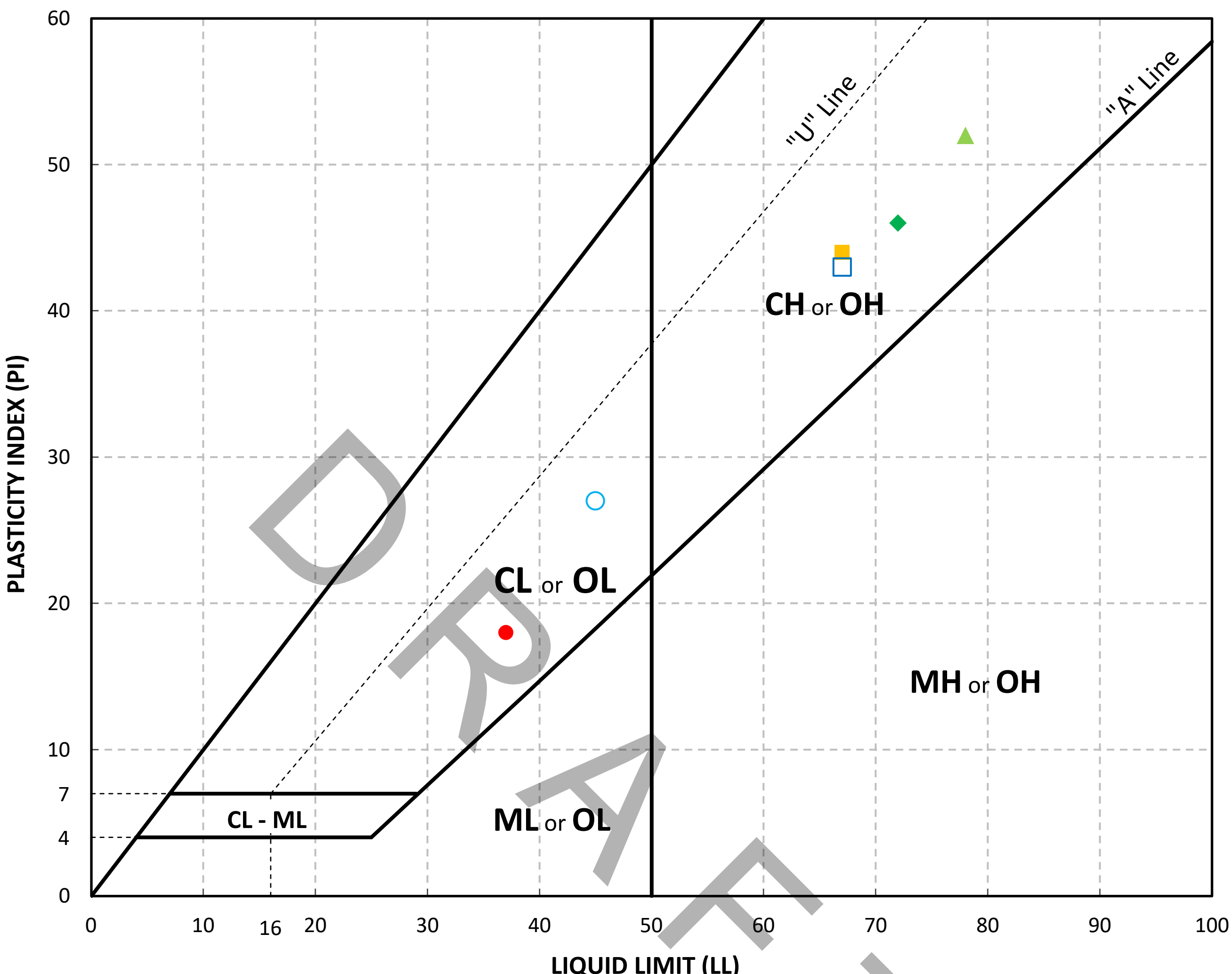
Project No. SD725A

FIGURE B-1.5

PERCENT PASSING THE NO. 200 SIEVE
(ASTM D1140)

SAMPLE ID	DESCRIPTION	PERCENT PASSING THE NO. 200 (%)
B-1 @ 10’ – 12’	Lean CLAY (CL)	100
B-2 @ 15’ – 17’	Lean CLAY (CH)	100
B-3 @ 30’ – 32’	Fat CLAY (CL)	99
B-3 @ 41’ – 41.5’	SILT (ML)	99
B-3 @ 45’ – 46.5’	Lean CLAY (CL)	100

ATTERBERG LIMITS
(ASTM D4318)



SYMBOL	BORING NO.	SAMPLE NO.	LIQUID LIMIT	PLASTIC LIMIT	PLASTICITY INDEX	SOIL DESCRIPTION (USCS)
●	B-1	10' - 12'	37	19	18	Lean CLAY (CL)
■	B-2	0' - 5'	67	23	44	Fat CLAY (CH)
▲	B-2	5' - 6.5'	78	26	52	Fat CLAY (CH)
◆	B-2	7.5' - 9'	72	26	46	Fat CLAY (CH)
○	B-2	15' - 17'	45	18	27	Lean CLAY (CL)
□	B-3	30' - 32'	67	24	43	Fat CLAY (CH)

Notes: (1) Unified Soil Classification System (USCS) per ASTM D2487
(2) NP = Non-Plastic per ASTM D4318

EXPANSION TEST RESULTS
(ASTM D4829)

SAMPLE ID	DESCRIPTION	EXPANSION INDEX
B-1 @ 0' – 5'	Fat CLAY (CH)	116
B-2 @ 0' – 5'	Fat CLAY (CH)	92
B-3 @ 0' – 5'	Fat CLAY (CH)	132

EXPANSION INDEX	POTENTIAL EXPANSION
0 to 20	Very low
21 to 50	Low
51 to 90	Medium
91 to 130	High
Above 130	Very High

CORROSIVITY TEST RESULTS
(ASTM D516, CTM 643)

SAMPLE ID	pH	RESISTIVITY [OHM-CM]	SULFATE CONTENT [%]	CHLORIDE CONTENT [%]
B-1 @ 0' – 5'	7.83	262	0.98	0.11
B-3 @ 0' – 5'	7.82	295	1.43	0.06

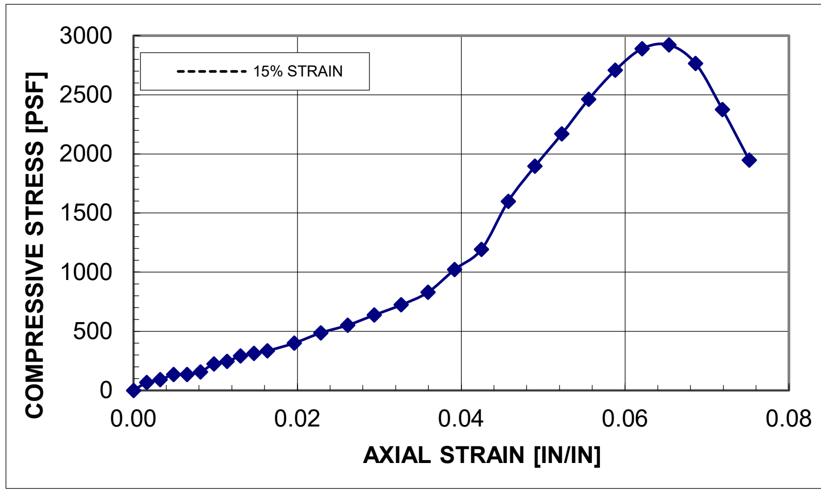
SULFATE CONTENT [%]	SULFATE EXPOSURE	CEMENT TYPE
0.00 to 0.10	Negligible	-
0.10 to 0.20	Moderate	II, IP(MS), IS(MS)
0.20 to 2.00	Severe	V
Above 2.00	Very Severe	V plus pozzolan

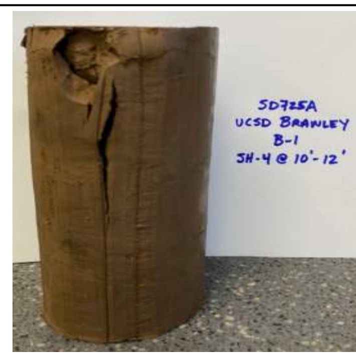
SOIL RESISTIVITY [OHM-CM]	GENERAL DEGREE OF CORROSIVITY TO FERROUS METALS
0 to 1.000	Verv Corrosive
1,000 to 2,000	Corrosive
2,000 to 5,000	Moderately Corrosive
5,000 to 10,000	Mildly Corrosive
Above 10,000	Slightly Corrosive

CHLORIDE (Cl) CONTENT [%]	GENERAL DEGREE OF CORROSIVITY TO METALS
0.00 to 0.03	Negligible
0.03 to 0.15	Corrosive
Above 0.15	Severely Corrosive

PROJECT:	**SDSU Brawley STEM Facility**	TEST METHOD:	**ASTM D2166**
SAMPLE I.D.:	**B-1 @ 10' - 12'**	TESTED BY:	**J. Krehbiel**
DESCRIPTION:	**Lean CLAY (CL)**	DATE:	**3/2/23**

TYPE OF SAMPLE	Shelby	
WET WT. OF SAMPLE	1232.66	[g]
INITIAL DIAM.	2.845	[in]
INITIAL HEIGHT	6.121	[in]
INITIAL AREA	6.357	[in^2]
INITIAL VOLUME	38.91	[in^3]
WET DENSITY	120.7	[pcf]
DRY WT. OF SAMPLE	967.75	[g]
WEIGHT OF WATER	264.9	[g]
INITIAL TOTAL MOISTURE	27.4	[%]
DRY DENSITY	94.7	[pcf]
L-D RATIO	2.2:1	
STRAIN RATE	1.00	[%/min]
STRAIN AT FAILURE	6.53	[%]
STRAIN AT FAILURE	0.400	[in]
15% STRAIN	0.918	[in]
FAILURE CRITERIA:	Yield	
COMP. STRENGTH:	2922	[psf]
SHEAR STRENGTH:	1461	[psf]
SPEC. GRAVITY (Assumed)	2.79	
SATURATION:	91	[%]
FAILURE MODE:	Semi-Plastic	





SPECIMEN AFTER FAILURE

Elapsed Time [min]	Axial Load [lb]	Strain Dial [in]	Total Deformation [in]	Axial Strain [in/in]	Corrected Area [in^2]	Stress [psf]
0.0	0.0	1.000	0.000	0.000	6.36	0
0.1	3.0	0.990	0.010	0.002	6.37	68
0.3	4.0	0.980	0.020	0.003	6.38	90
0.7	6.0	0.960	0.040	0.007	6.40	135
0.8	7.0	0.950	0.050	0.008	6.41	157
1.0	10.0	0.940	0.060	0.010	6.42	224
1.4	14.0	0.910	0.090	0.015	6.45	312
1.6	15.0	0.900	0.100	0.016	6.46	334
1.9	18.0	0.880	0.120	0.020	6.48	400
2.3	22.0	0.860	0.140	0.023	6.51	487
2.6	25.0	0.840	0.160	0.026	6.53	551
2.9	29.0	0.820	0.180	0.029	6.55	638
3.2	33.0	0.800	0.200	0.033	6.57	723
3.5	38.0	0.780	0.220	0.036	6.59	830
3.8	47.0	0.760	0.240	0.039	6.62	1023
4.2	55.0	0.740	0.260	0.042	6.64	1193
4.6	74.0	0.720	0.280	0.046	6.66	1600
4.9	88.0	0.700	0.300	0.049	6.68	1896
5.1	101.0	0.680	0.320	0.052	6.71	2168
5.5	115.0	0.660	0.340	0.056	6.73	2460
5.8	127.0	0.640	0.360	0.059	6.75	2708
6.2	136.0	0.620	0.380	0.062	6.78	2889
6.5	138.0	0.600	0.400	0.065	6.80	2922
6.8	131.0	0.580	0.420	0.069	6.83	2764
7.1	113.0	0.560	0.440	0.072	6.85	2376
7.4	93.0	0.540	0.460	0.075	6.87	1948

GROUP DELTA

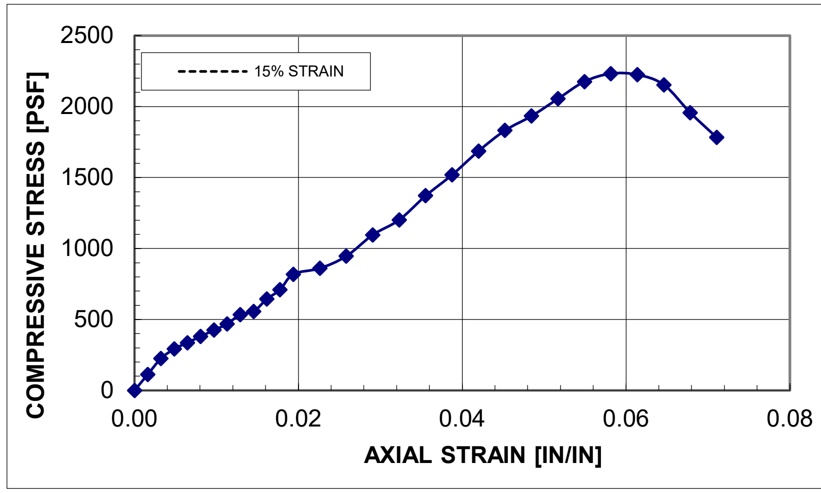
UNCONFINED COMPRESSIVE STRENGTH

Project No. SD725A

FIGURE B-6.1

PROJECT:	**SDSU Brawley STEM Facility**	TEST METHOD:	**ASTM D2166**
SAMPLE I.D.:	**B-2 @ 15' - 17'**	TESTED BY:	**J. Krehbiel**
DESCRIPTION:	**Lean CLAY (CL)**	DATE:	**3/2/23**

TYPE OF SAMPLE	Shelby	
WET WT. OF SAMPLE	1248.68	[g]
INITIAL DIAM.	2.85	[in]
INITIAL HEIGHT	6.191	[in]
INITIAL AREA	6.379	[in^2]
INITIAL VOLUME	39.49	[in^3]
WET DENSITY	120.4	[pcf]
DRY WT. OF SAMPLE	998.57	[g]
WEIGHT OF WATER	250.1	[g]
INITIAL TOTAL MOISTURE	25.0	[%]
DRY DENSITY	96.3	[pcf]
L-D RATIO	2.2:1	
STRAIN RATE	0.99	[%/min]
STRAIN AT FAILURE	5.81	[%]
STRAIN AT FAILURE	0.360	[in]
15% STRAIN	0.929	[in]
FAILURE CRITERIA:	Yield	
COMP. STRENGTH:	2232	[psf]
SHEAR STRENGTH:	1116	[psf]
SPEC. GRAVITY (Assumed)	2.8	
SATURATION:	86	[%]
FAILURE MODE:	semi-plastic	



SPECIMEN AFTER FAILURE

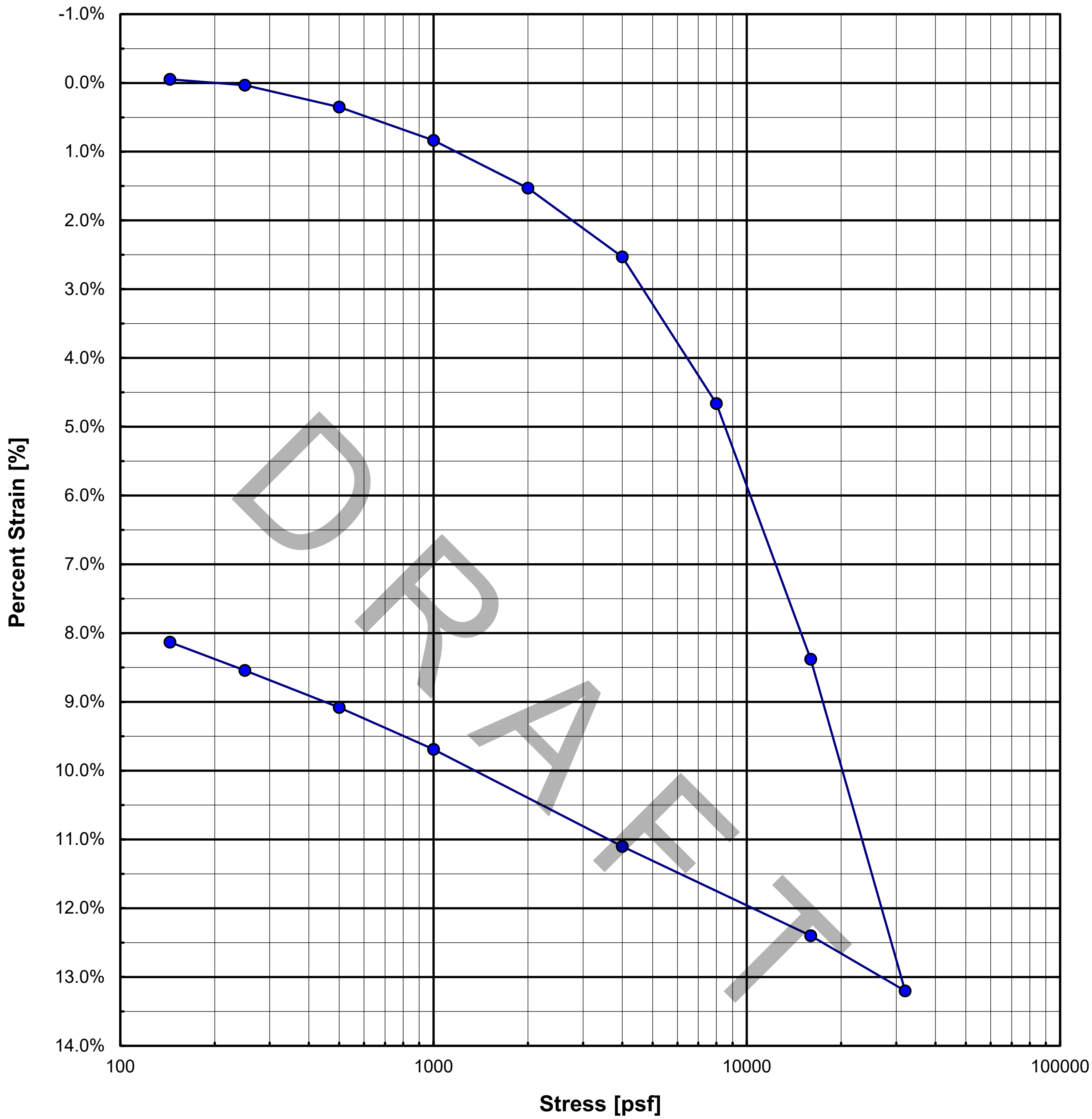
Elapsed Time [min]	Axial Load [lb]	Strain Dial [in]	Total Deformation [in]	Axial Strain [in/in]	Corrected Area [in^2]	Stress [psf]
0.0	0.0	1.000	0.000	0.000	6.38	0.0
0.2	5.0	0.990	0.010	0.002	6.39	112.7
0.3	10.0	0.980	0.020	0.003	6.40	225.0
0.7	15.0	0.960	0.040	0.006	6.42	336.4
0.8	17.0	0.950	0.050	0.008	6.43	380.6
1.0	19.0	0.940	0.060	0.010	6.44	424.7
1.5	25.0	0.910	0.090	0.015	6.47	556.1
1.7	29.0	0.900	0.100	0.016	6.48	644.0
1.8	32.0	0.890	0.110	0.018	6.49	709.5
2.1	37.0	0.880	0.120	0.019	6.51	819.0
2.3	39.0	0.860	0.140	0.023	6.53	860.4
2.6	43.0	0.840	0.160	0.026	6.55	945.5
2.9	50.0	0.820	0.180	0.029	6.57	1095.8
3.2	55.0	0.800	0.200	0.032	6.59	1201.4
3.6	63.0	0.780	0.220	0.036	6.61	1371.5
3.9	70.0	0.760	0.240	0.039	6.64	1518.8
4.3	78.0	0.740	0.260	0.042	6.66	1686.7
4.6	85.0	0.720	0.280	0.045	6.68	1831.9
4.9	90.0	0.700	0.300	0.048	6.70	1933.1
5.2	96.0	0.680	0.320	0.052	6.73	2055.0
5.6	102.0	0.660	0.340	0.055	6.75	2176.0
5.9	105.0	0.640	0.360	0.058	6.77	2232.3
6.2	105.0	0.620	0.380	0.061	6.80	2224.7
6.5	102.0	0.600	0.400	0.065	6.82	2153.7
6.8	93.0	0.580	0.420	0.068	6.84	1956.8
7.1	85.0	0.560	0.440	0.071	6.87	1782.3

GROUP DELTA

UNCONFINED COMPRESSIVE STRENGTH

Project No. SD725A

FIGURE B-6.2



SAMPLE ID: B-1 @ 10' - 12' **SOIL TYPE: Lean CLAY (CL)**

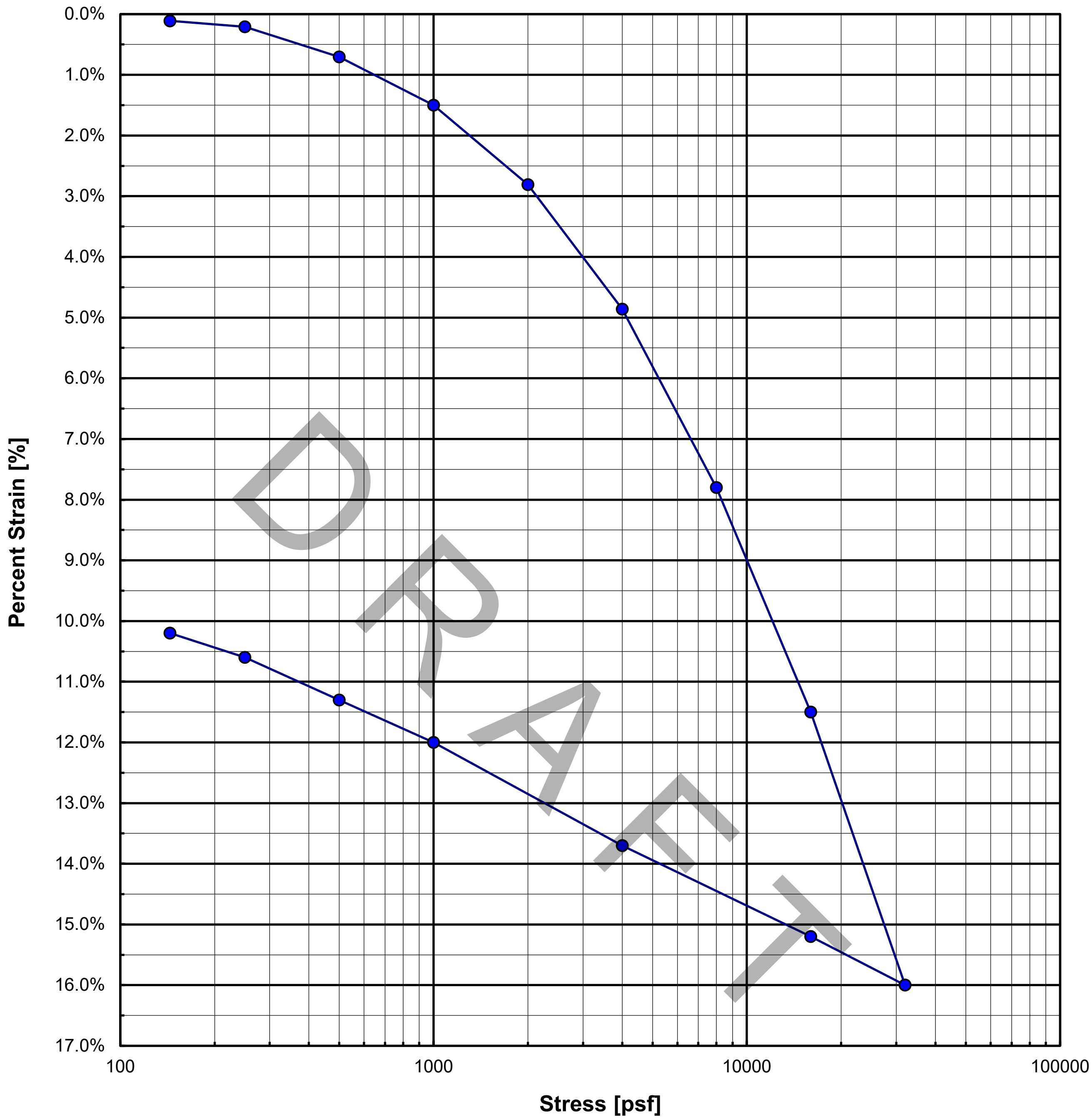
INITIAL	FINAL	
1.0000	0.9187	SAMPLE HEIGHT [IN]
95.6	104.1	DRY DENSITY [PCF]
2.79	2.79	SPECIFIC GRAVITY (ASSUMED)
0.82	0.67	VOID RATIO (e)
27.6	24.1	WATER CONTENT [%]
93.6	100.0	DEGREE OF SATURATION [%]

GROUP DELTA

CONSOLIDATION RESULTS

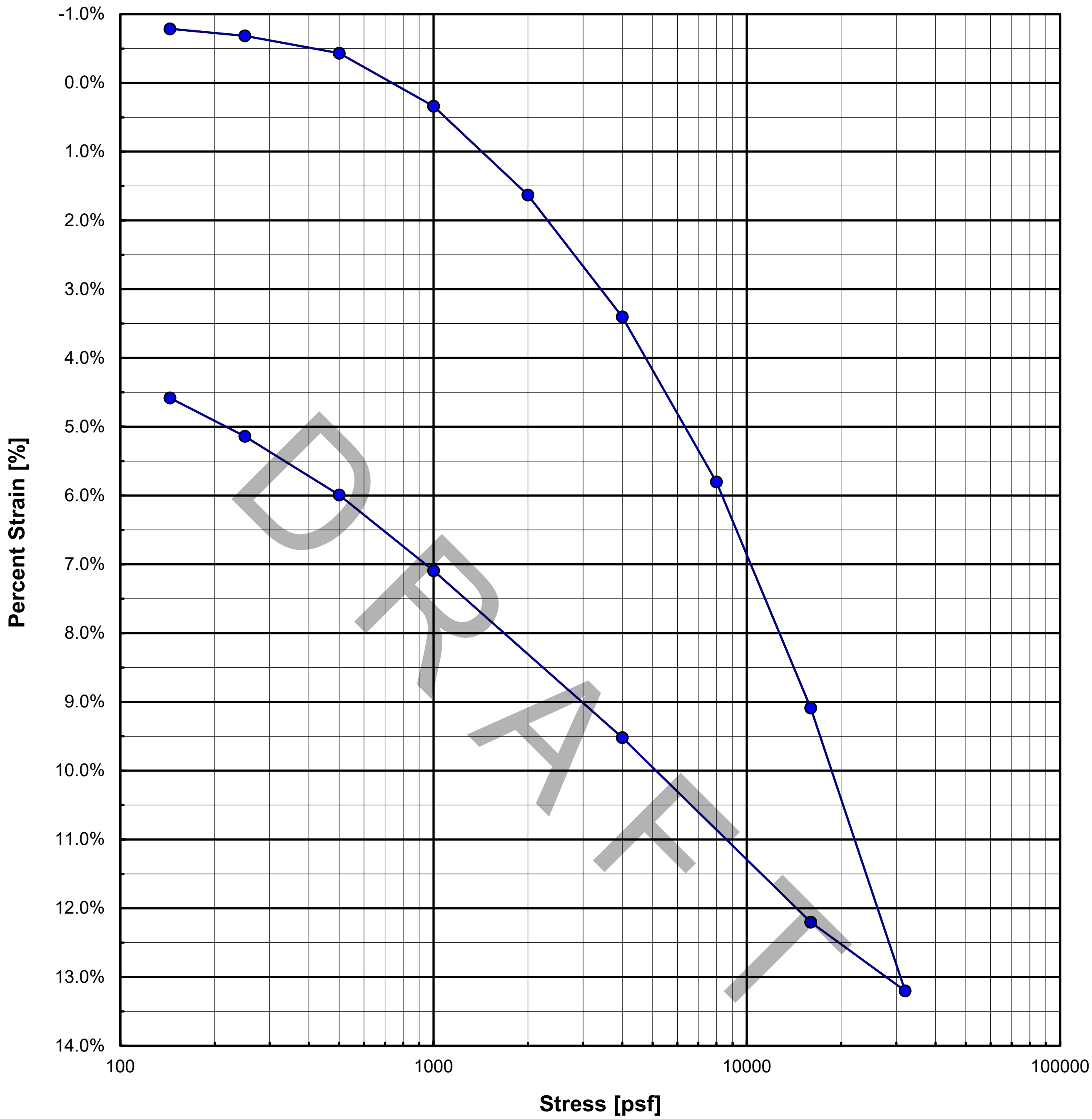
Project No. SD725A

FIGURE B-7.1



SAMPLE ID: B-2 @ 15' - 17' **SOIL TYPE: Lean CLAY (CL)**

INITIAL	FINAL	
1.0000	0.8980	SAMPLE HEIGHT [IN]
94.0	104.7	DRY DENSITY [PCF]
2.80	2.80	SPECIFIC GRAVITY (ASSUMED)
0.86	0.67	VOID RATIO (e)
28.2	23.9	WATER CONTENT [%]
92.2	100.0	DEGREE OF SATURATION [%]



SAMPLE ID: B-3 @ 30' - 32' **SOIL TYPE: Fat CLAY (CH)**

INITIAL	FINAL	
1.0000	0.9542	SAMPLE HEIGHT [IN]
93.3	97.7	DRY DENSITY [PCF]
2.85	2.85	SPECIFIC GRAVITY (ASSUMED)
0.92	0.82	VOID RATIO (e)
29.7	28.8	WATER CONTENT [%]
91.5	100.0	DEGREE OF SATURATION [%]

GROUP DELTA

CONSOLIDATION RESULTS

Project No. SD725A

FIGURE B-7.3

APPENDIX C
DATA FROM PRIOR GEOTECHNICAL STUDY (GROUP DELTA, 2022)

APPENDIX C

DATA FROM PRIOR GEOTECHNICAL STUDY (GROUP DELTA, 2022)

Subsurface data from the project site and the surrounding area was compiled from Group Delta's prior geotechnical investigation to the southwest of the SDSU Brawley STEM Facility project (Group Delta, 2022). The locations of the exploration records included in Appendix C are shown on Figure 2, Exploration Locations.

FIELD EXPLORATION

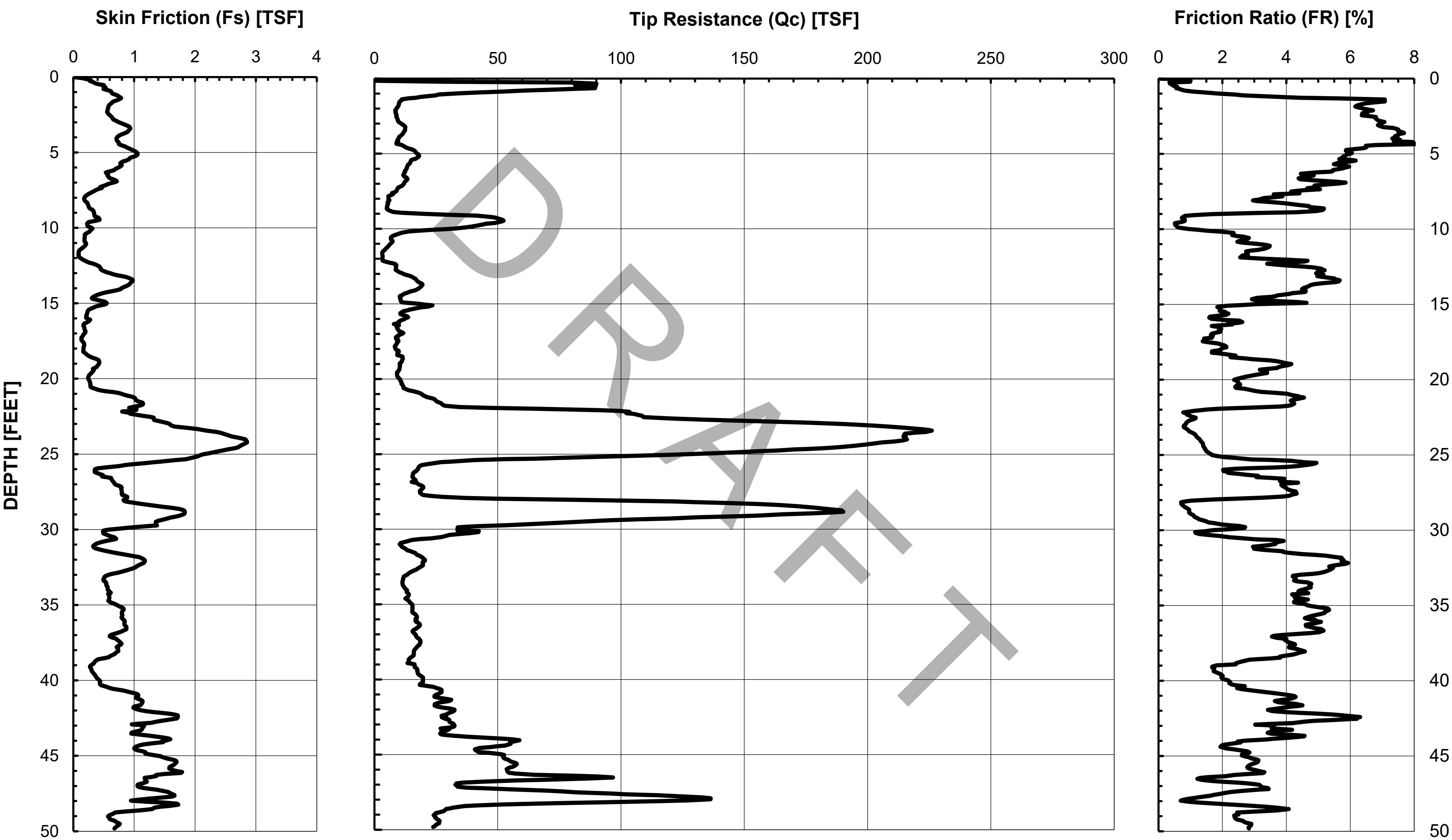
FIELD EXPLORATION

The field exploration included a visual and geologic reconnaissance of the site, and the advancement of five cone penetration test soundings (CPT) on March 22nd, 2022. Bulk soil samples were collected from the upper 4-feet of existing soil at each CPT sounding location. The CPT soundings were advanced by Kehoe Testing and Engineering to a maximum depth of about 88½ feet below surrounding grades. The approximate CPT locations are shown on the Exploration Plan, Figure 3. The CPT soundings and interpreted soil profiles are shown in Figures A-1 through A-5.

The CPT soundings were advanced using a 30-ton rig with a 15 cm^2 cone in general accordance with ASTM D5778. Integrated electronic circuitry was used to measure the tip resistance (Qc) and skin friction (Fs) at 2.5 cm (1 inch) intervals while the CPT was advanced into the soil with hydraulic down pressure. A piezometer located behind the cone tip measured transient pore pressure (u). Figure A for each CPT sounding presents the raw data. The CPT data may also be used to estimate soil parameters such as undrained shear strength, as shown Figure B for each CPT sounding. The interpretations are based on the normalized cone resistance and friction ratio (Robertson, 2010).

At the location of CPT-5, shear wave velocity measurements were also taken at 5-foot depth intervals using an air actuated hammer located inside the front jack of the rig. The raw interval shear wave data is attached immediately after the interpreted soil profile for CPT-5 at the end of Appendix A. The average shear wave velocity measured within the upper 88½ feet (Vs_d) at the location of CPT-5 was 585 ft/s or 178 m/s. Based on a commonly used extrapolation method, the average shear wave velocity in the upper 100 feet of the soil profile (Vs_{30}) is estimated at 610 ft/s or 186 m/s (Boore, 2004). This corresponds to a 2019 California Building Code (CBC) seismic Site Class D (Stiff Soil) with respect to seismic design of the planned short-period structure at this site.

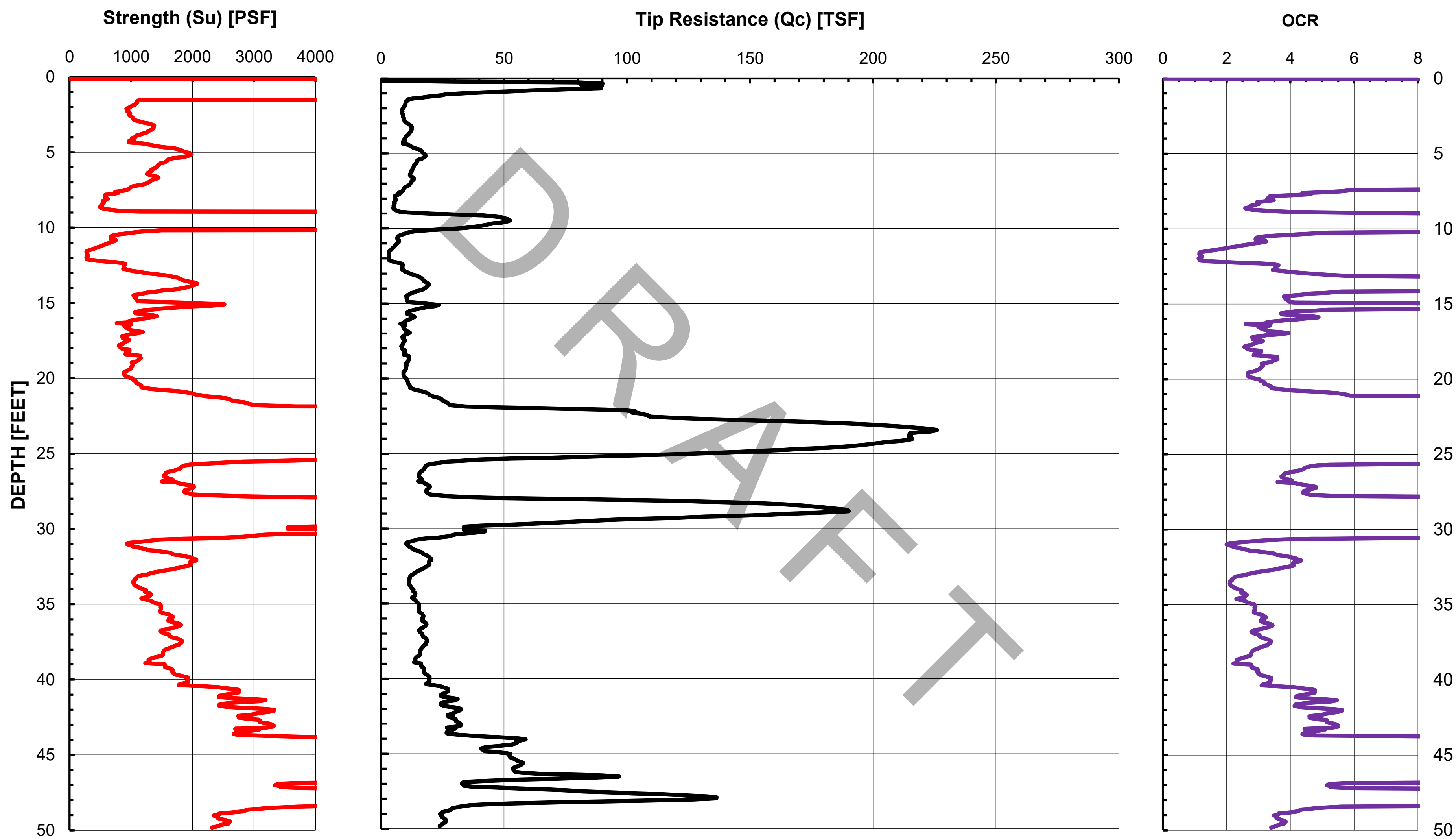
The CPT locations were determined by visually estimating, pacing and taping distances from landmarks shown on the Exploration Plans. The locations shown should not be considered more accurate than is implied by the method of measurement used and the scale of the map. The lines designating the interface between differing soil materials on the logs may be abrupt or gradational. Further, soil conditions at locations between the excavations may be substantially different from those at the specific locations we explored. It should be noted that the passage of time may also result in changes in the soil conditions reported in the logs.



GROUP DELTA

CONE PENETOMETER DATA (CPT-1)

Document No. 22-0028
Project No. SD725
FIGURE A-1a



GROUP DELTA

ESTIMATED STRENGTH AND OCR (CPT-1)

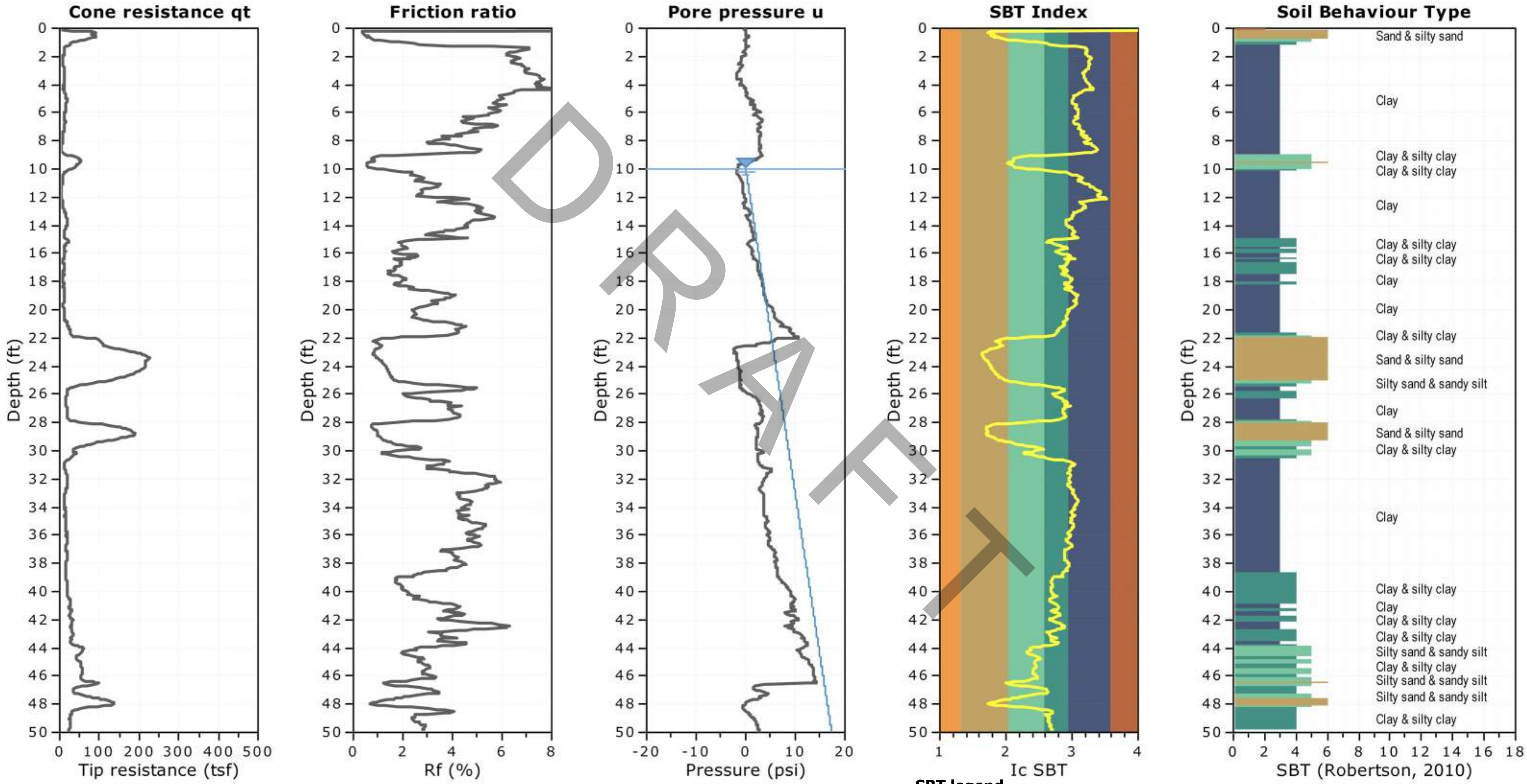
Document No. 22-0028
Project No. SD725
FIGURE A-1b

Group Delta Consultants
9245 Activity Road, Suite 103
San Diego, California 92126
www.GroupDelta.com

CPT-1

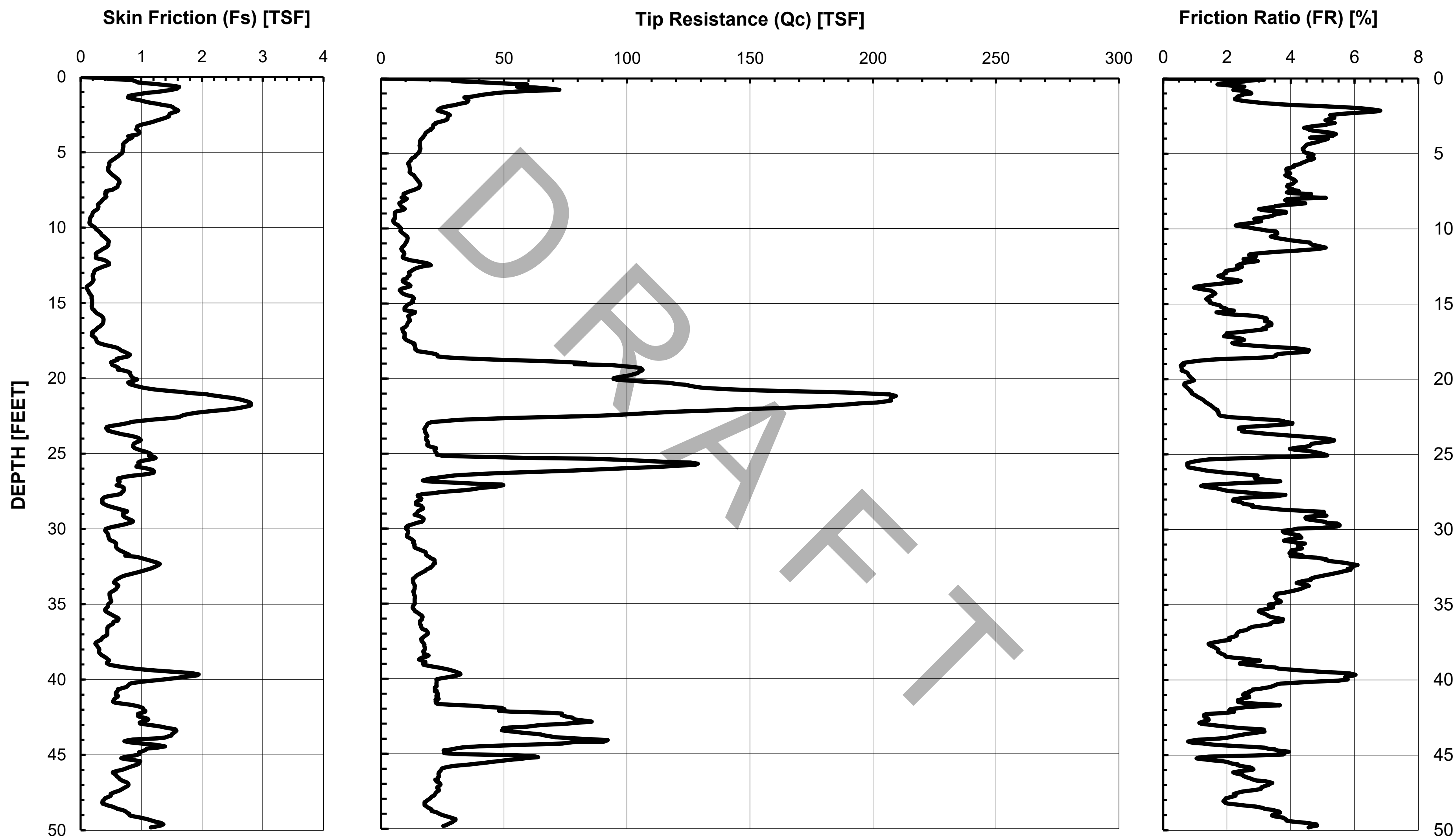
Project: Brawley Science Center Addition
Location: San Diego State University, Brawley Campus

Total depth: 50.21 ft, Date: 3/22/2022
Surface Elevation: -131.00 ft



SBT legend

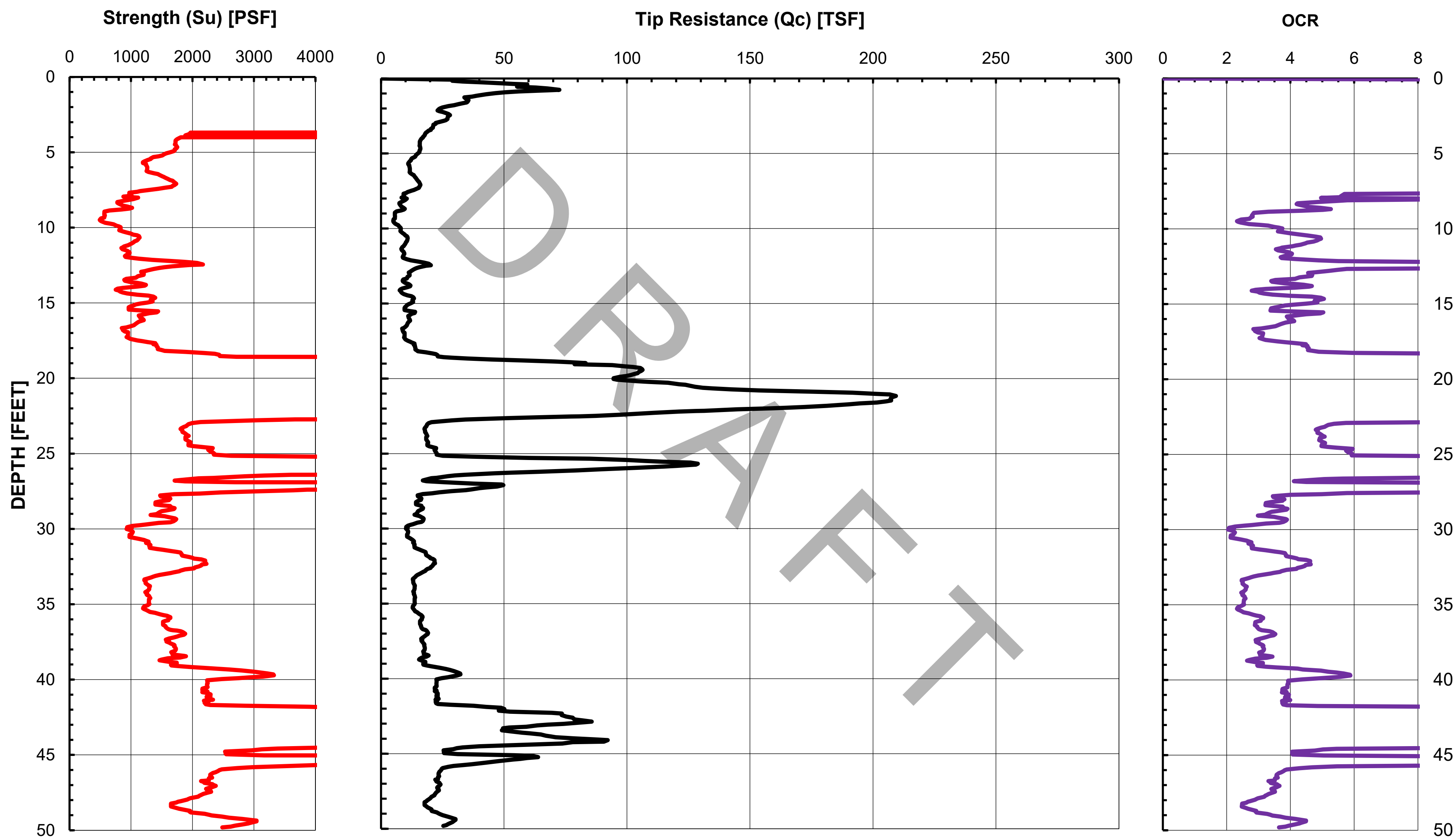
1. Sensitive fine grained
2. Organic material
3. Clay to silty clay
4. Clayey silt to silty clay
5. Silty sand to sandy silt
6. Clean sand to silty sand
7. Gravely sand to sand
8. Very stiff sand to clayey sand
9. Very stiff fine grained



GROUP DELTA

CONE PENETOMETER DATA (CPT-2)

Document No. 22-0028
Project No. SD725
FIGURE A-2a



GROUP DELTA

ESTIMATED STRENGTH AND OCR (CPT-2)

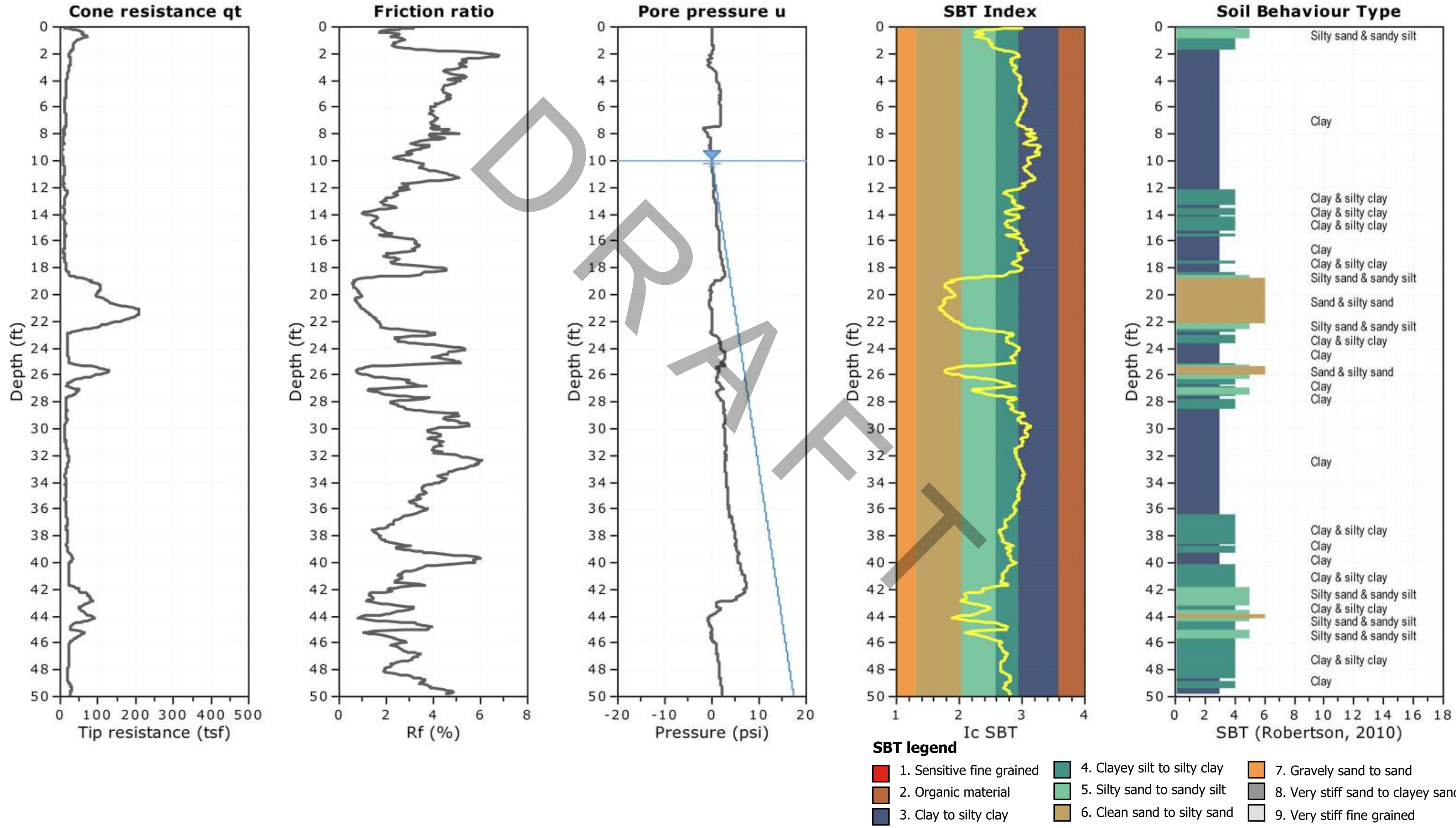
Document No. 22-0028
Project No. SD725
FIGURE A-2b

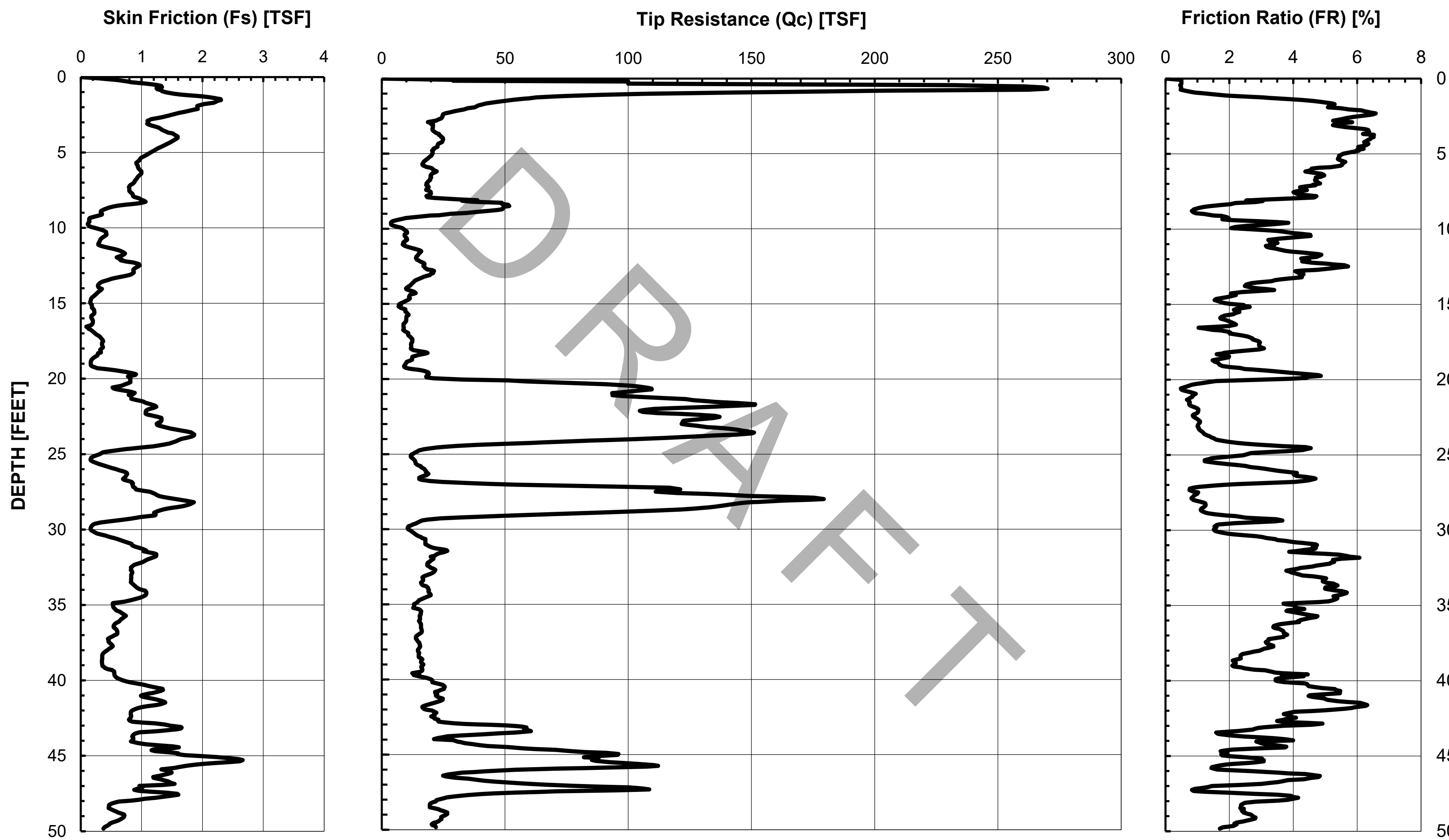
Group Delta Consultants
9245 Activity Road, Suite 103
San Diego, California 92126
www.GroupDelta.com

CPT-2

Project: **Brawley Science Center Addition**
Location: **San Diego State University, Brawley Campus**

Total depth: 50.21 ft, Date: 3/22/2022
Surface Elevation: -134.00 ft

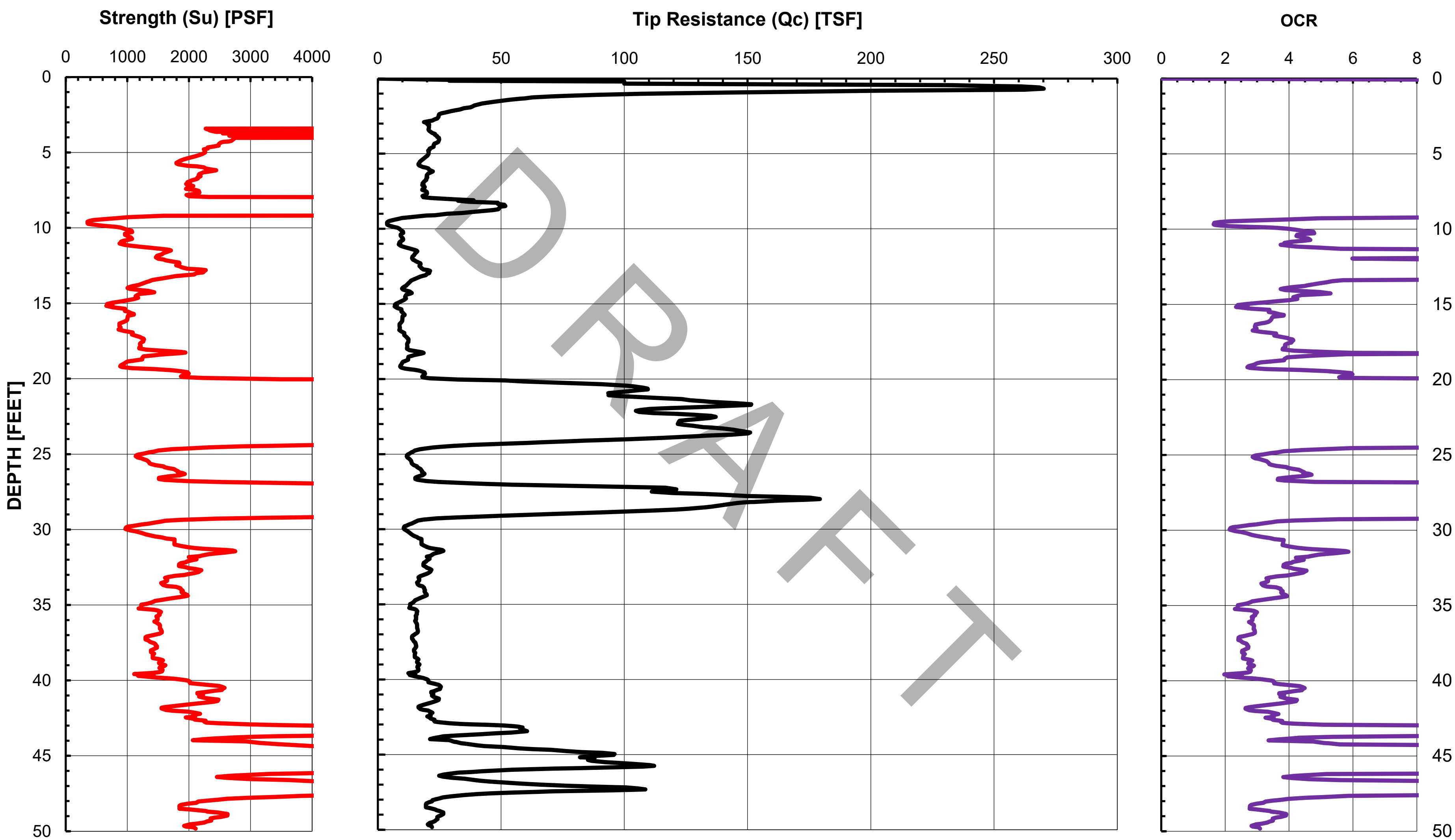




GROUP DELTA

CONE PENETOMETER DATA (CPT-3)

Document No. 22-0028
Project No. SD725
FIGURE A-3a



GROUP DELTA

ESTIMATED STRENGTH AND OCR (CPT-3)

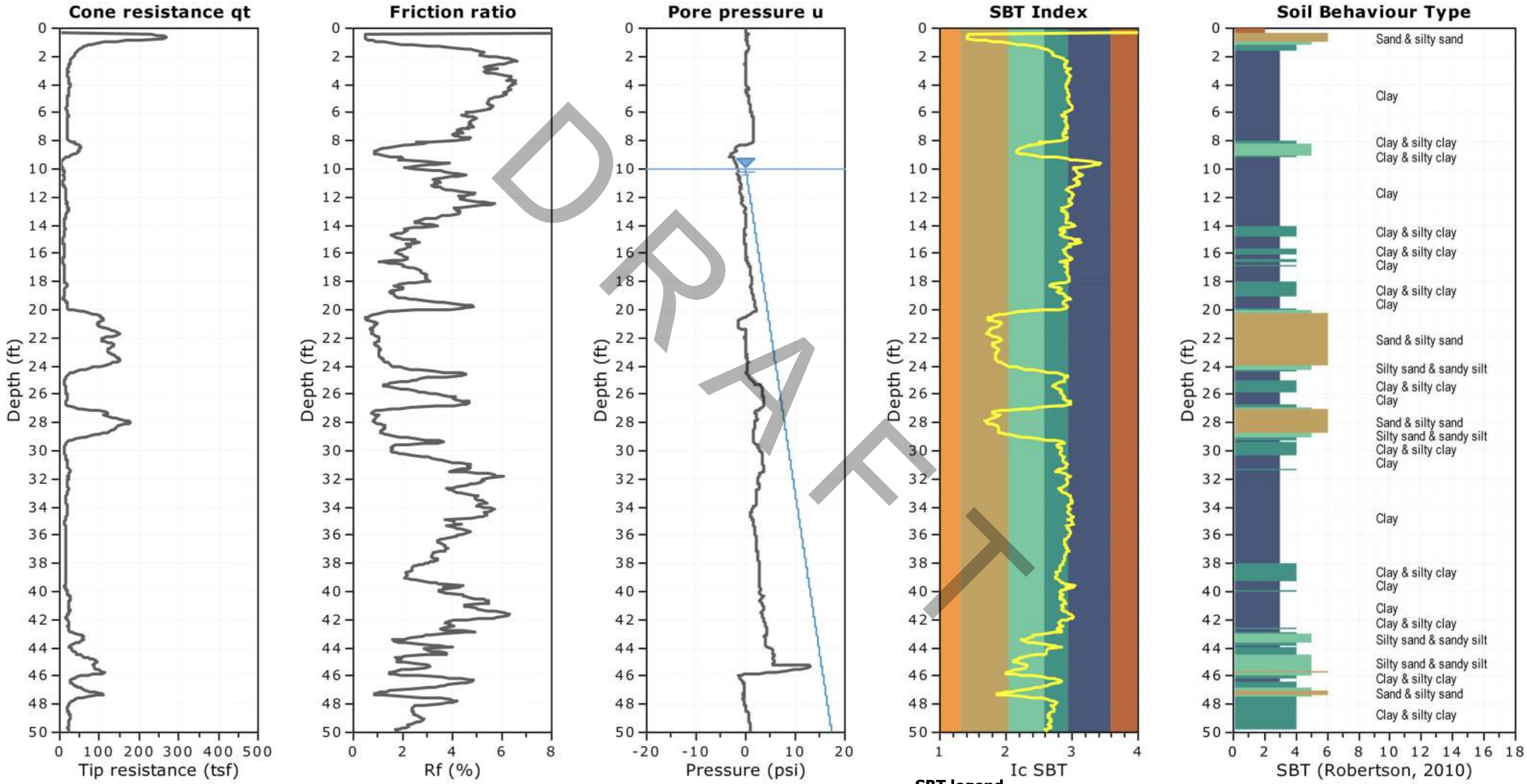
Document No. 22-0028
Project No. SD725
FIGURE A-3b

Group Delta Consultants
9245 Activity Road, Suite 103
San Diego, California 92126
www.GroupDelta.com

CPT-3

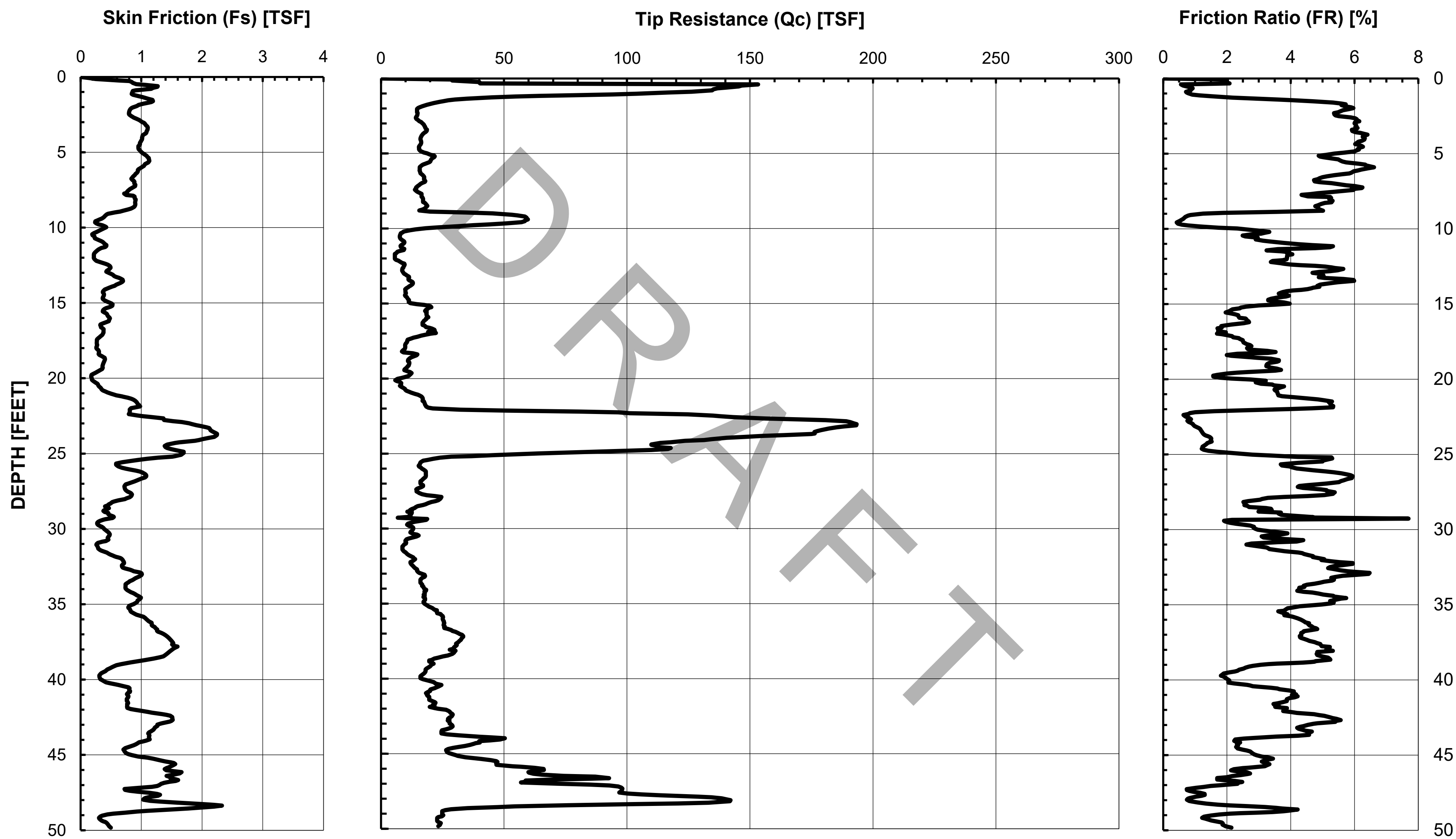
Project: **Brawley Science Center Addition**
Location: **San Diego State University, Brawley Campus**

Total depth: 50.28 ft, Date: 3/22/2022
Surface Elevation: -132.00 ft



SBT legend

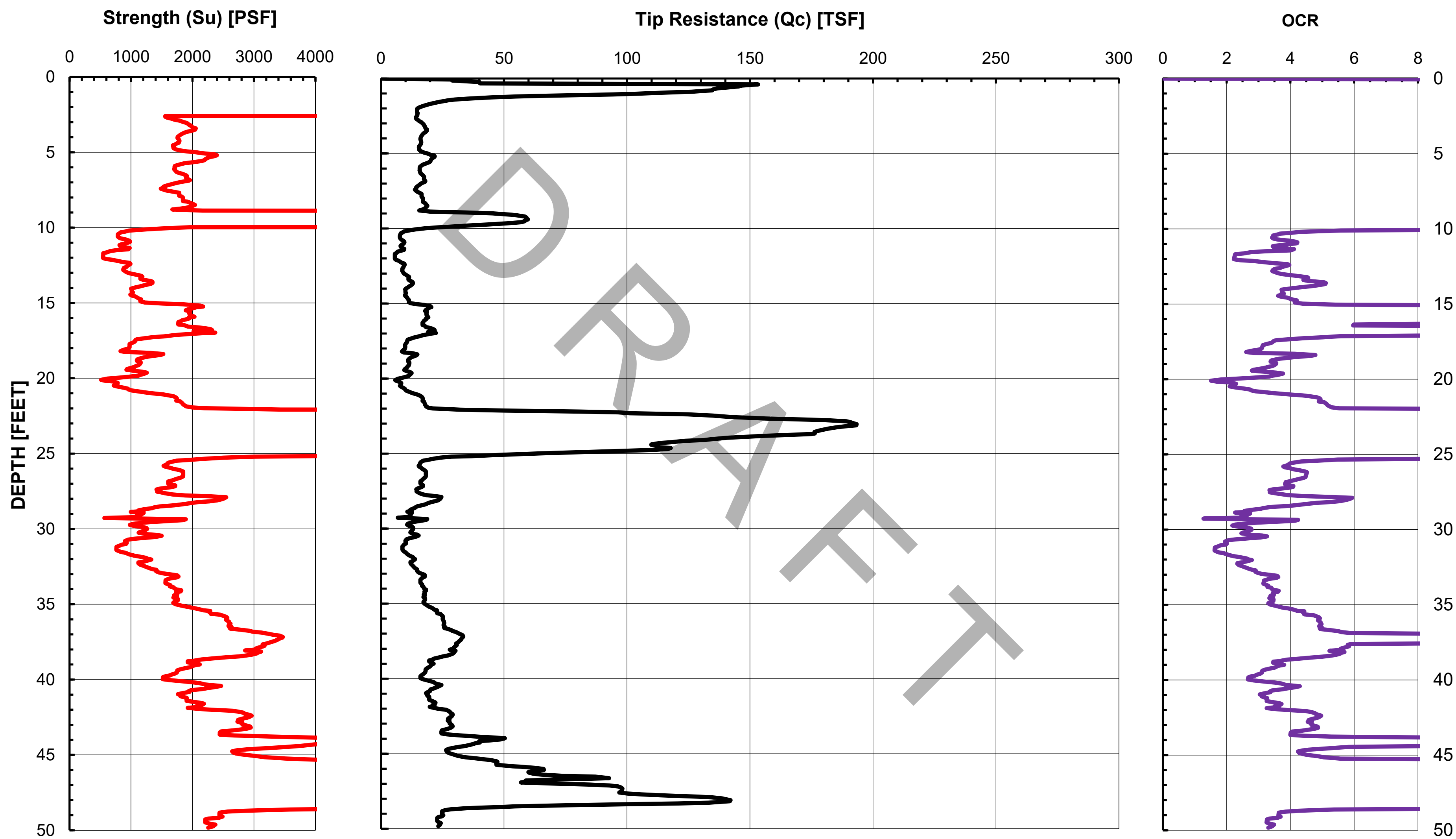
1. Sensitive fine grained
2. Organic material
3. Clay to silty clay
4. Clayey silt to silty clay
5. Silty sand to sandy silt
6. Clean sand to silty sand
7. Gravely sand to sand
8. Very stiff sand to clayey sand
9. Very stiff fine grained



GROUP DELTA

CONE PENETOMETER DATA (CPT-4)

Document No. 22-0028
Project No. SD725
FIGURE A-4a



GROUP DELTA

ESTIMATED STRENGTH AND OCR (CPT-4)

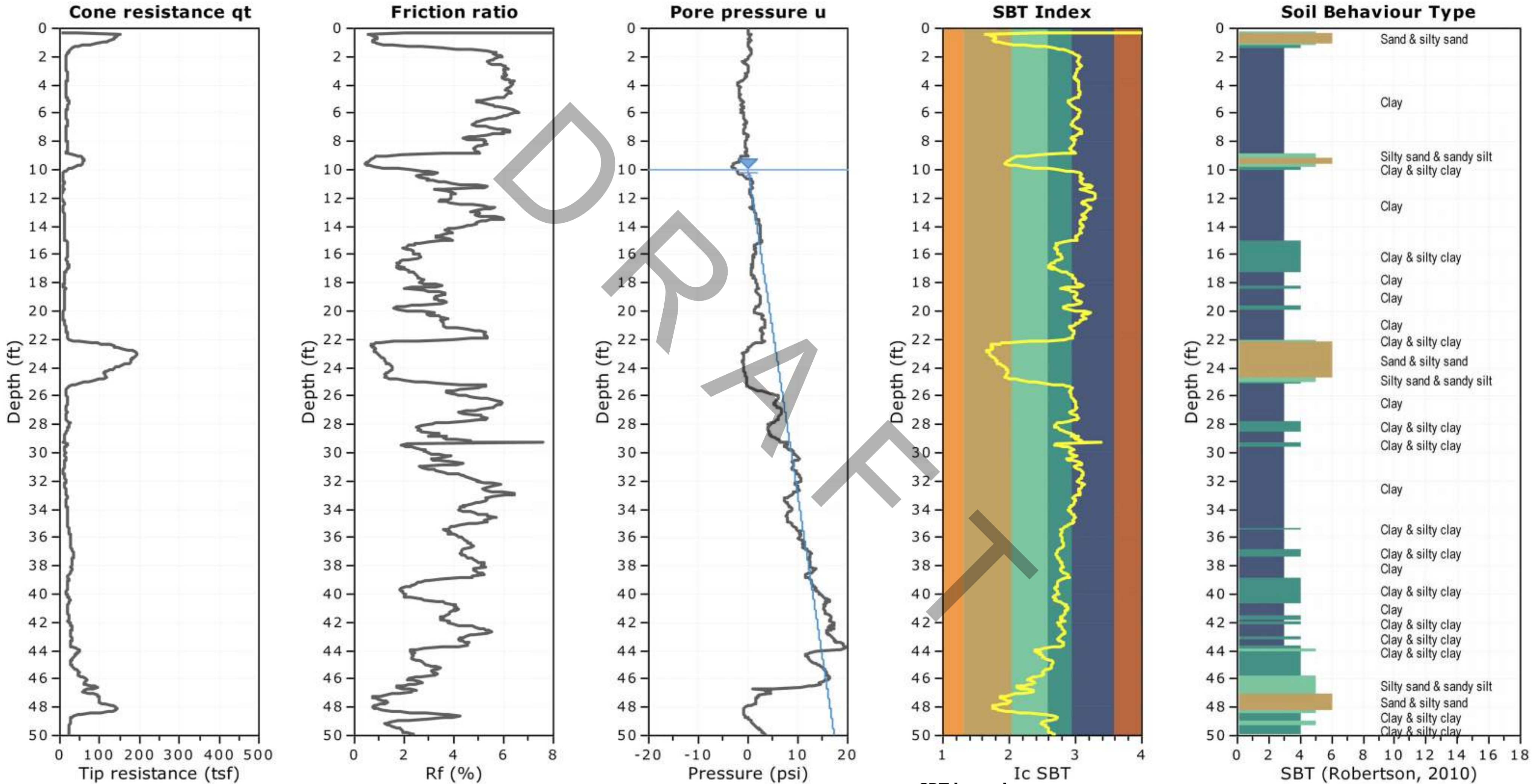
Document No. 22-0028
Project No. SD725
FIGURE A-3b

Group Delta Consultants
9245 Activity Road, Suite 103
San Diego, California 92126
www.GroupDelta.com

CPT-4

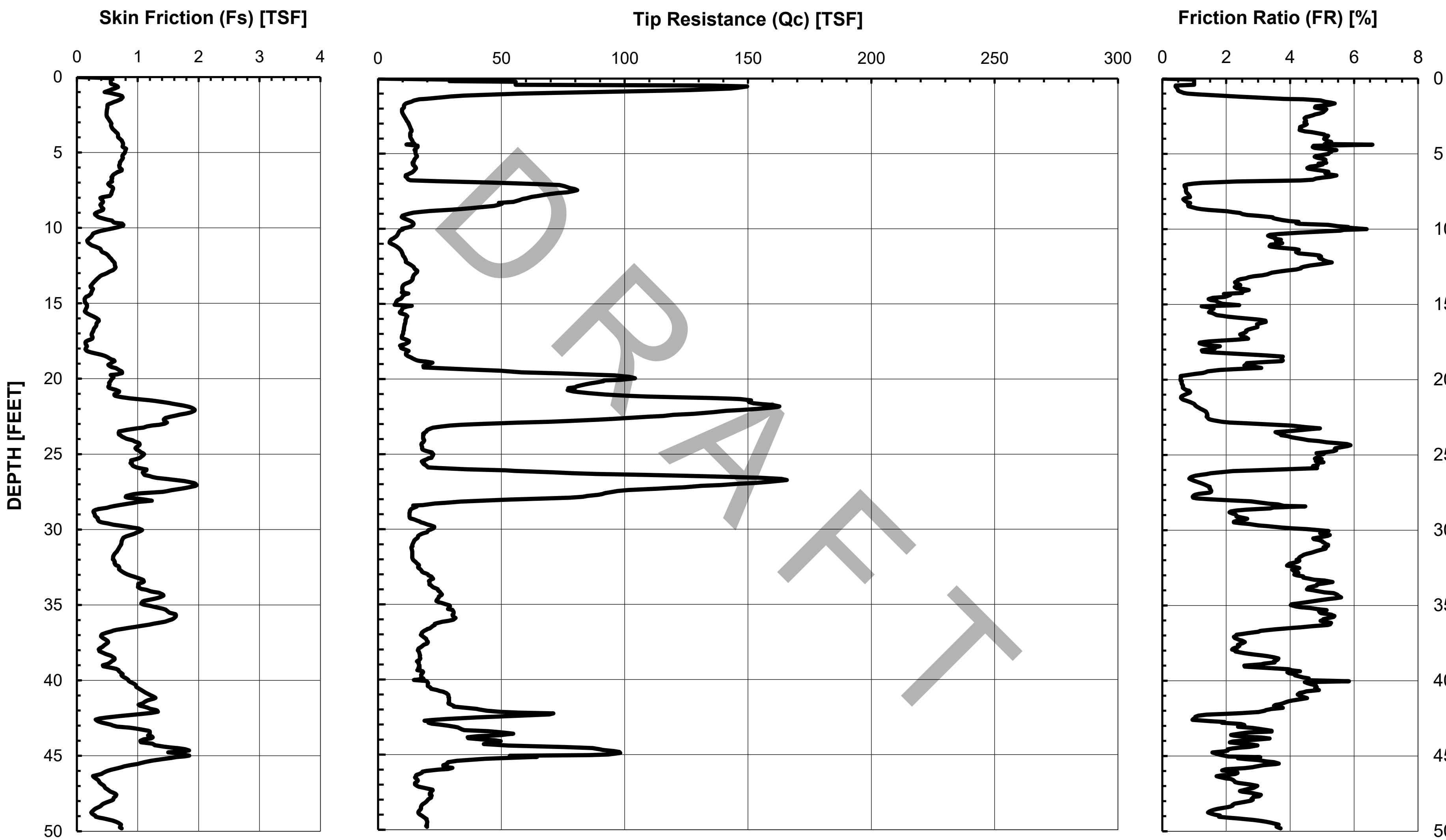
Project: **Brawley Science Center Addition**
Location: **San Diego State University, Brawley Campus**

Total depth: 50.33 ft, Date: 3/22/2022
Surface Elevation: -132.00 ft



SBT legend

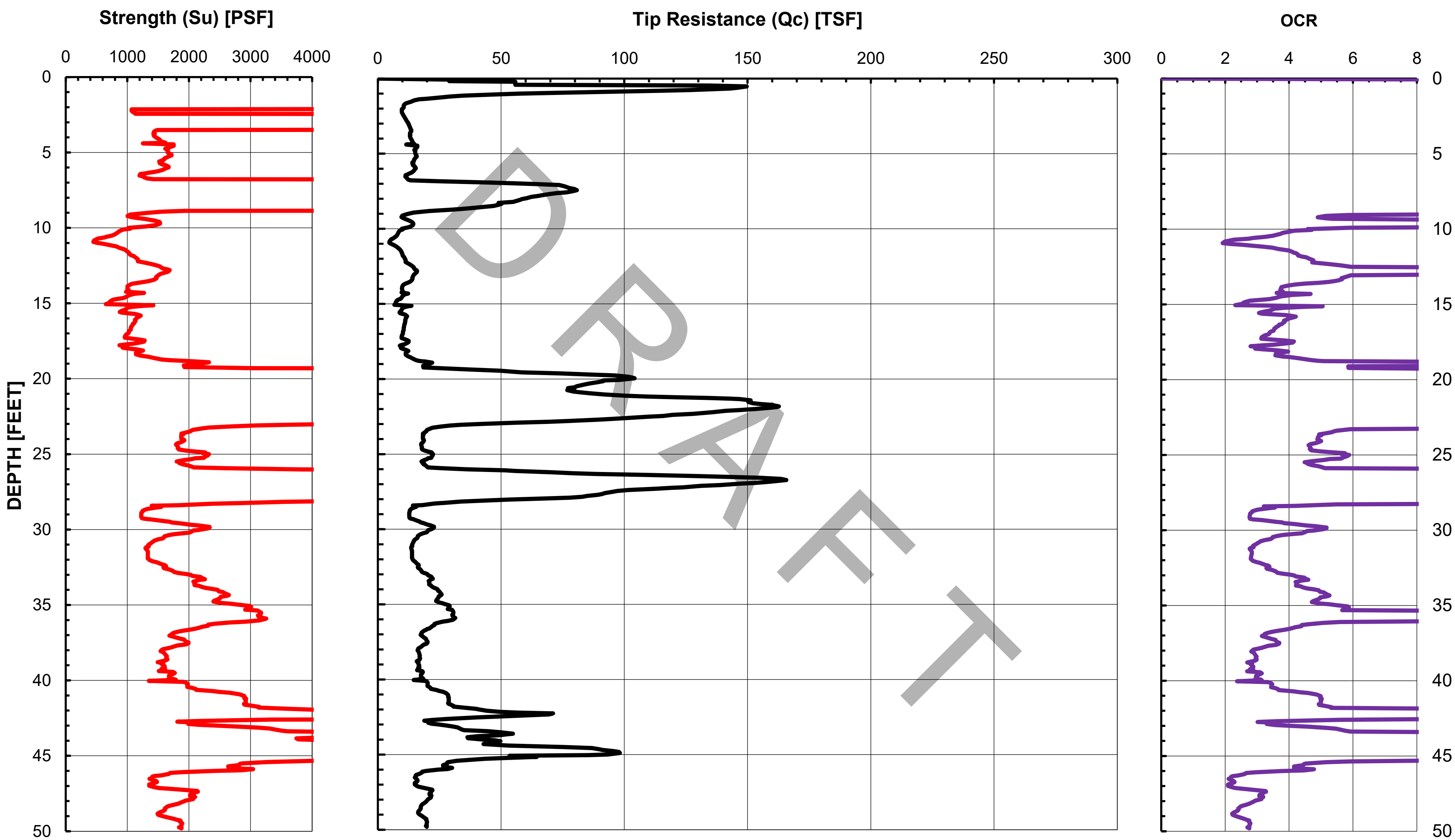
- 1. Sensitive fine grained
- 2. Organic material
- 3. Clay to silty clay
- 4. Clayey silt to silty clay
- 5. Silty sand to sandy silt
- 6. Clean sand to silty sand
- 7. Gravely sand to sand
- 8. Very stiff sand to clayey sand
- 9. Very stiff fine grained



GROUP DELTA

CONE PENETOMETER DATA (CPT-5)

Document No. 22-0028
Project No. SD725
FIGURE A-5a



GROUP DELTA

ESTIMATED STRENGTH AND OCR (CPT-5)

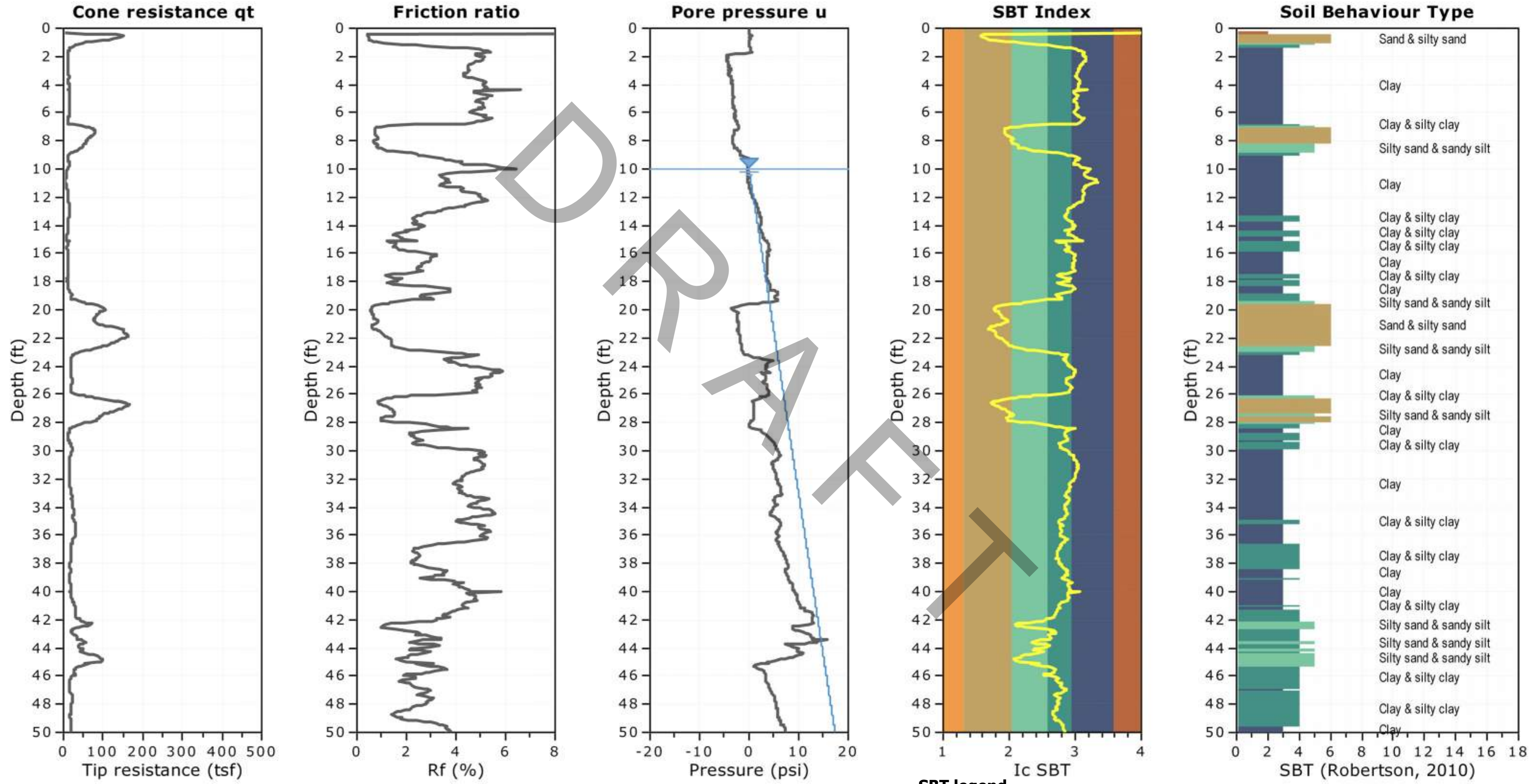
Document No. 22-0028
Project No. SD725
FIGURE A-3b

Group Delta Consultants
9245 Activity Road, Suite 103
San Diego, California 92126
www.GroupDelta.com

CPT-5

Project: **Brawley Science Center Addition**
Location: **San Diego State University, Brawley Campus**

Total depth: 88.66 ft, Date: 3/22/2022
Surface Elevation: -132.00 ft



SBT legend

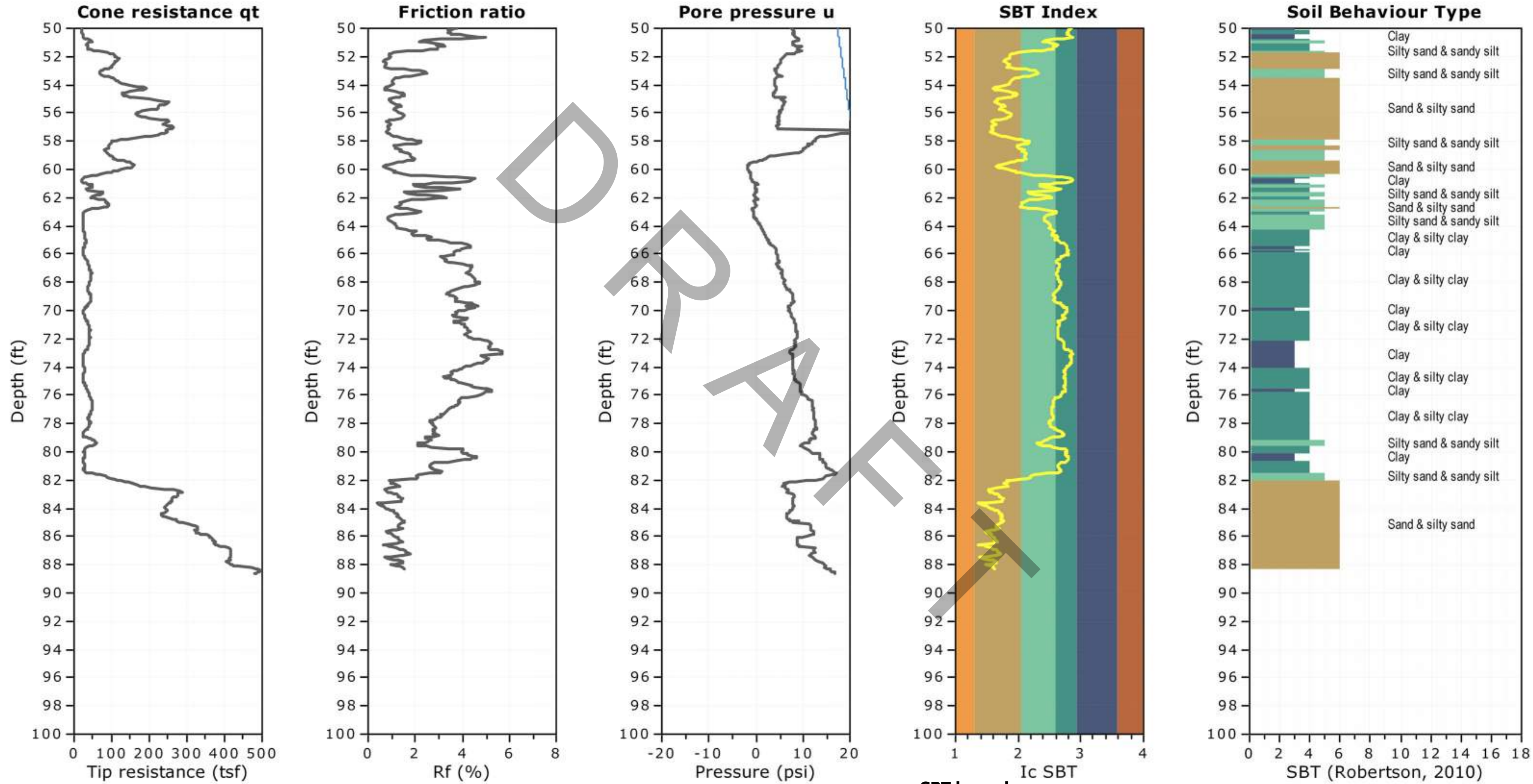
1. Sensitive fine grained
2. Organic material
3. Clay to silty clay
4. Clayey silt to silty clay
5. Silty sand to sandy silt
6. Clean sand to silty sand
7. Gravely sand to sand
8. Very stiff sand to clayey sand
9. Very stiff fine grained

Group Delta Consultants
9245 Activity Road, Suite 103
San Diego, California 92126
www.GroupDelta.com

CPT-5

Project: **Brawley Science Center Addition**
Location: **San Diego State University, Brawley Campus**

Total depth: 88.66 ft, Date: 3/22/2022
Surface Elevation: -132.00 ft



SBT legend

1. Sensitive fine grained
2. Organic material
3. Clay to silty clay
4. Clayey silt to silty clay
5. Silty sand to sandy silt
6. Clean sand to silty sand
7. Gravely sand to sand
8. Very stiff sand to clayey sand
9. Very stiff fine grained

Group Delta Consultants
SDSU Brawley Campus Science Building Addition
Brawley, CA

CPT Shear Wave Measurements

Location	Tip Depth (ft)	Geophone Depth (ft)	Travel Distance (ft)	S-Wave Arrival (msec)	S-Wave Velocity rom Surfac (ft/sec)	Interval S-Wave Velocity (ft/sec)
CPT-5	5.02	4.02	4.49	8.54	525.77	
	10.01	9.01	9.23	19.24	479.69	443
	15.09	14.09	14.23	33.16	429.17	359
	20.05	19.05	19.15	44.50	430.44	434
	25.00	24.00	24.08	52.78	456.29	595
	30.05	29.05	29.12	62.38	466.80	525
	35.01	34.01	34.07	73.12	465.93	461
	40.03	39.03	39.08	81.68	478.47	586
	45.08	44.08	44.13	89.40	493.57	653
	50.03	49.03	49.07	96.24	509.88	723
	55.09	54.09	54.13	103.84	521.25	665
	60.07	59.07	59.10	109.64	539.07	858
	65.32	64.32	64.35	117.76	546.46	646
	70.08	69.08	69.11	123.96	557.51	767
	75.00	74.00	74.03	133.20	555.76	532
	80.05	79.05	79.08	139.94	565.07	749
	85.01	84.01	84.03	145.80	576.36	846
	88.62	87.62	87.64	149.04	588.05	1114

Shear Wave Source Offset - 2.00 ft

S-Wave Velocity from Surface = Travel Distance/S-Wave Arrival
Interval S-Wave Velocity = (Travel Dist2-Travel Dist1)/(Time2-Time1)

LABORATORY TESTING

LABORATORY TESTING

Laboratory testing was conducted in a manner consistent with the level of care and skill ordinarily exercised by members of the profession currently practicing under similar conditions and in the same locality. No warranty, express or implied, is made as to the correctness or serviceability of the test results, or the conclusions derived from these tests. Where a specific laboratory test method has been referenced, such as ASTM or Caltrans, the reference only applies to the specified laboratory test method, which has been used only as a guidance document for the general performance of the test and not as a "Test Standard". A brief test description follows.

Classification: Soils were visually classified according to the Unified Soil Classification System as established by the American Society of Civil Engineers per ASTM D2487. The soil classifications are shown on the boring logs in Appendix A.

Particle Size Analysis: Particle size analyses were performed in accordance with ASTM D422 and were used to supplement the visual soil classifications. The test results and associated soil classifications are summarized in Figures B-1.1 through B-1.3.

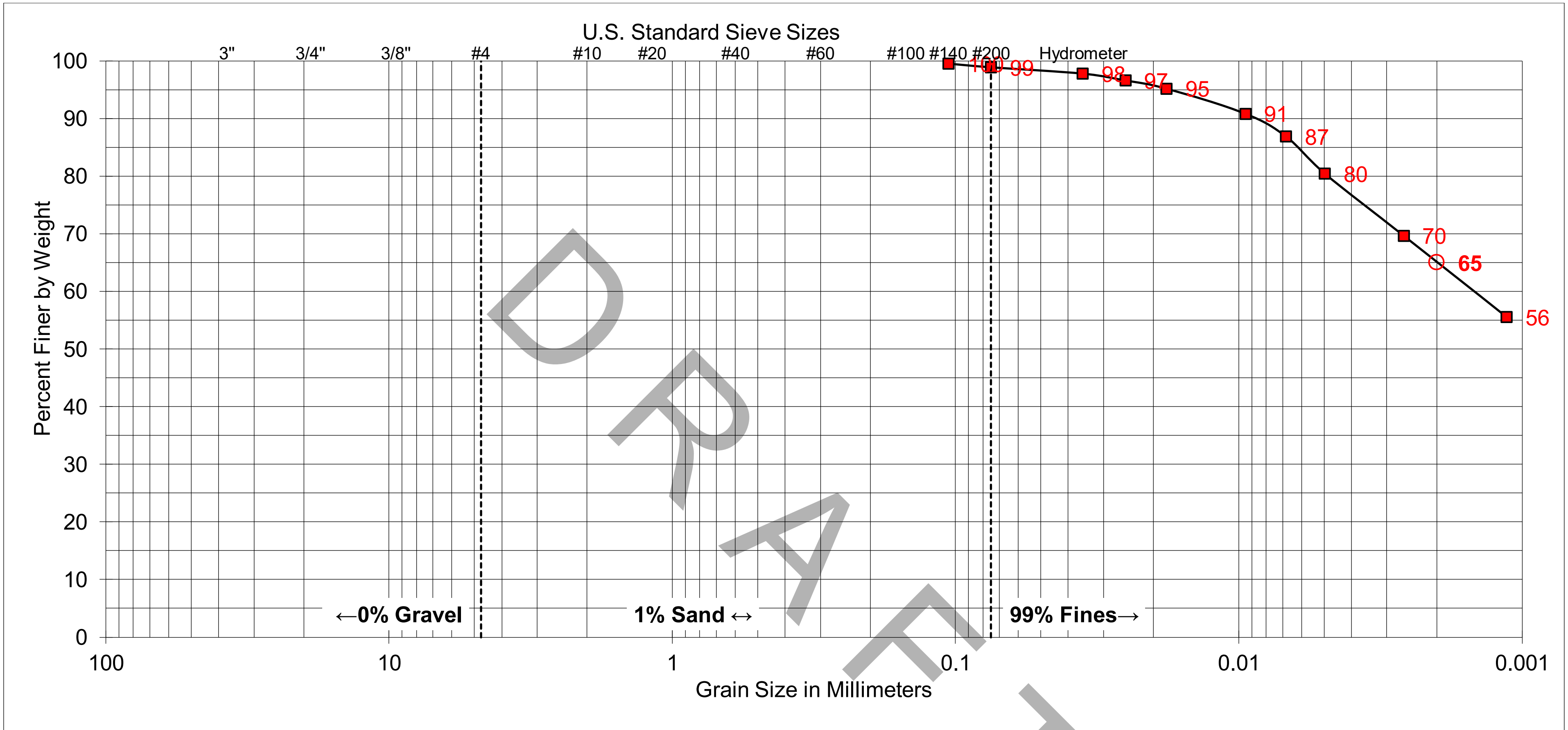
Atterberg Limits: ASTM D4318 was used to determine the liquid and plastic limits, and plasticity index of a selected clayey soil sample. The results are shown in Figure B-1.1.

Expansion Index: The expansion potentials of selected soil samples were estimated in general accordance with the laboratory procedures outlined in ASTM D4829. The test results are summarized in Figure B-2, along with common criteria for evaluating the expansion potential.

Corrosivity Suite: To assess the potential for reactivity with buried metals, a soil sample was tested for pH and minimum saturated resistivity per Caltrans test method 643. To assess the potential for reactivity with concrete, the sample was tested for water soluble sulfate content per ASTM D516. The water-soluble chloride content was estimated using a calibrated ion specific electronic probe. The soluble sulfate and chloride was extracted from the soil under vacuum using a 10:1 (water to dry soil) dilution ratio. The corrosivity test results are summarized in Figure B-3.

Maximum Density/Optimum Moisture: The maximum density and optimum moisture content of a soil sample were determined per ASTM D1557. The results are shown in Figure B-4.

Direct Shear: The shear strength of a selected samples of the on-site soil was assessed using remolded shear testing performed in general accordance with ASTM D3080. The sample was remolded to about 90 percent relative compaction at near optimum moisture content, saturated, and then tested. The test results are presented in Figures B-5.



COARSE	FINE	COARSE	MEDIUM	FINE	SILT AND
GRAVEL		SAND			CLAY

SAMPLE	
EXPLORATION ID:	CPT-2
SAMPLE DEPTH:	1' - 4'

UNIFIED SOIL CLASSIFICATION: CH

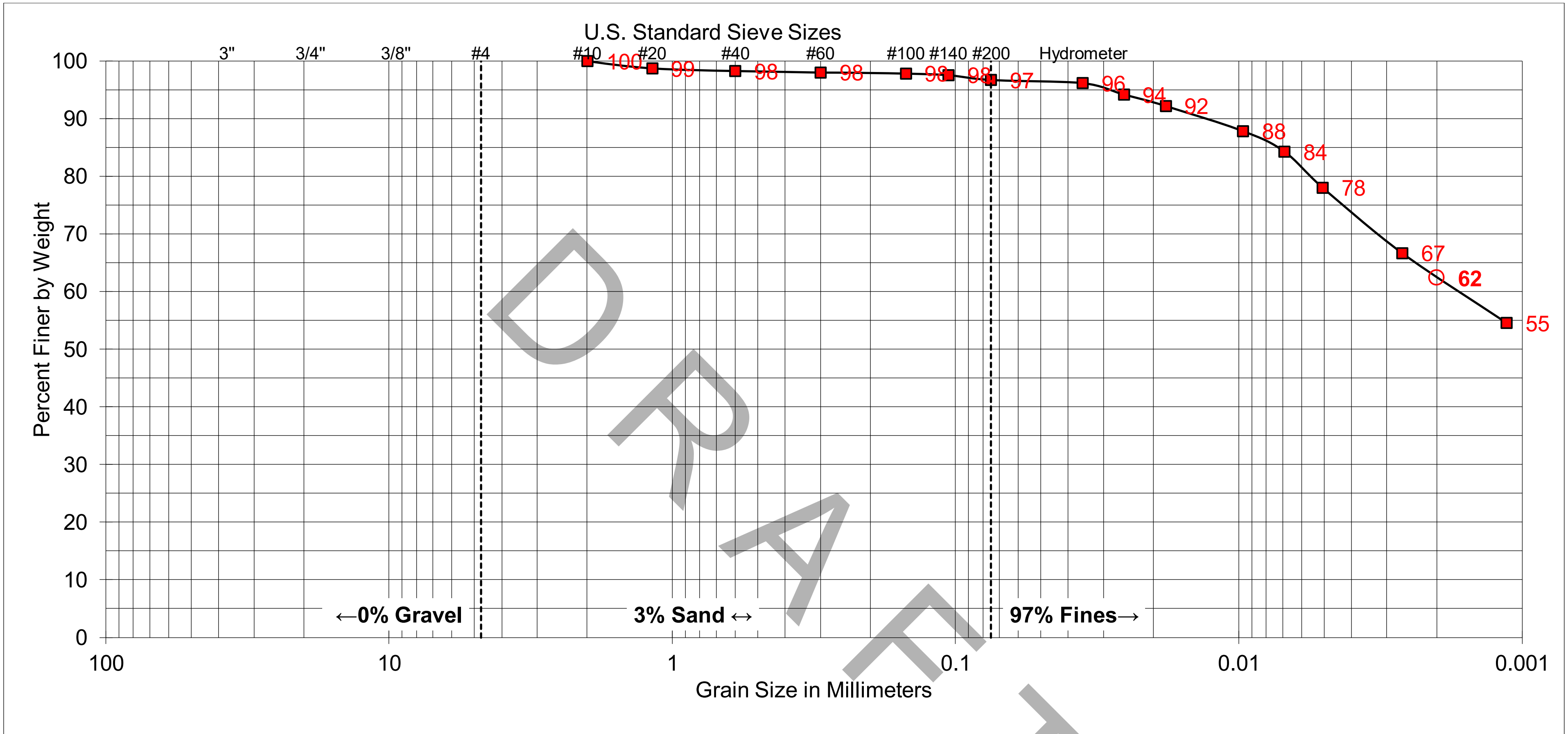
DESCRIPTION: FAT CLAY

ATTERBERG LIMITS	
LIQUID LIMIT:	70
PLASTIC LIMIT:	23
PLASTICITY INDEX:	47

GROUP DELTA

SOIL CLASSIFICATION

Document No. 22-0028
Project No. SD725
FIGURE B-1.1



COARSE	FINE	COARSE	MEDIUM	FINE	SILT AND
GRAVEL		SAND			CLAY

SAMPLE	
EXPLORATION ID:	CPT-3
SAMPLE DEPTH:	1' - 4'

UNIFIED SOIL CLASSIFICATION: CH

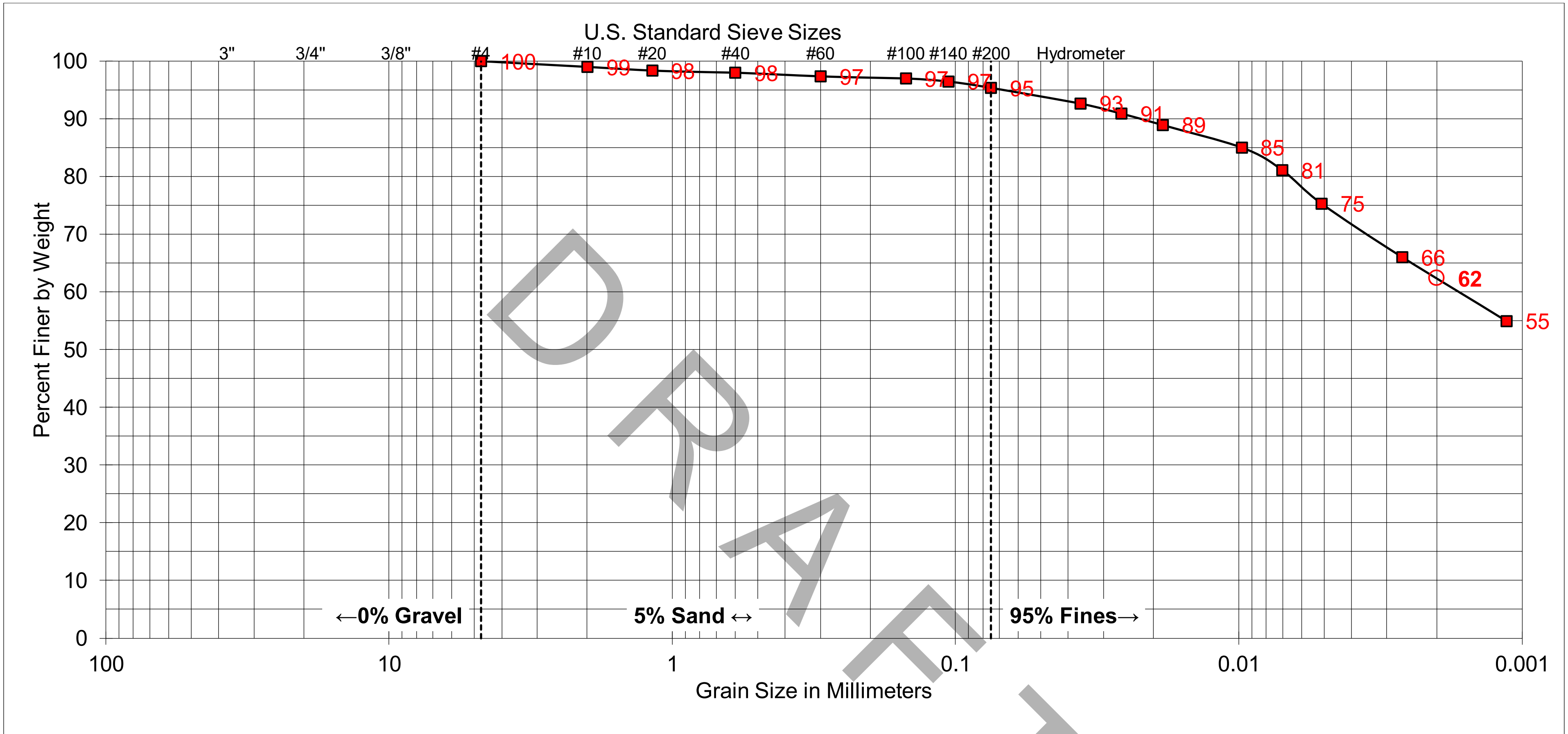
DESCRIPTION: FAT CLAY

ATTERBERG LIMITS	
LIQUID LIMIT:	---
PLASTIC LIMIT:	---
PLASTICITY INDEX:	---

GROUP DELTA

SOIL CLASSIFICATION

Document No. 22-0028
Project No. SD725
FIGURE B-1.2



COARSE	FINE	COARSE	MEDIUM	FINE	SILT AND
GRAVEL		SAND			CLAY

SAMPLE	
EXPLORATION ID:	CPT-4
SAMPLE DEPTH:	1' - 4'

UNIFIED SOIL CLASSIFICATION: CH

DESCRIPTION: FAT CLAY

ATTERBERG LIMITS	
LIQUID LIMIT:	---
PLASTIC LIMIT:	---
PLASTICITY INDEX:	---

GROUP DELTA

SOIL CLASSIFICATION

Document No. 22-0028
Project No. SD725
FIGURE B-1.3

EXPANSION TEST RESULTS
(ASTM D4829)

SAMPLE ID	DESCRIPTION	EXPANSION INDEX
CPT-2 @ 1' – 4'	**Lacustrine Deposits**: Dark brown fat clay (CH).	127
CPT-3 @ 1' – 4'	**Lacustrine Deposits**: Dark brown fat clay (CH).	125
CPT-4 @ 1' – 4'	**Lacustrine Deposits**: Dark brown fat clay (CH).	100

EXPANSION INDEX	POTENTIAL EXPANSION
0 to 20	Very low
21 to 50	Low
51 to 90	Medium
91 to 130	High
Above 130	Very High

SOLUBLE SULFATE TEST RESULTS
(ASTM D516)

SAMPLE ID	pH	RESISTIVITY [OHM-CM]	SULFATE CONTENT [%]	CHLORIDE CONTENT [%]
CPT-3 @ 1' - 4'	7.3	270	1.65 %	0.07

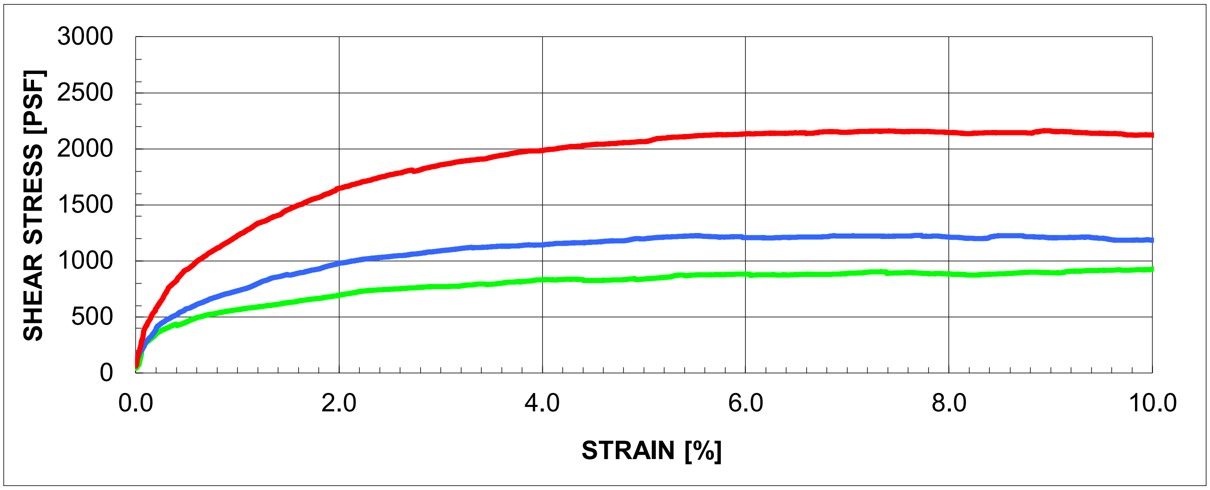
SULFATE CONTENT [%]	SULFATE EXPOSURE	CEMENT TYPE
0.00 to 0.10	Negligible	-
0.10 to 0.20	Moderate	II, IP(MS), IS(MS)
0.20 to 2.00	Severe	V
Above 2.00	Very Severe	V plus pozzolan

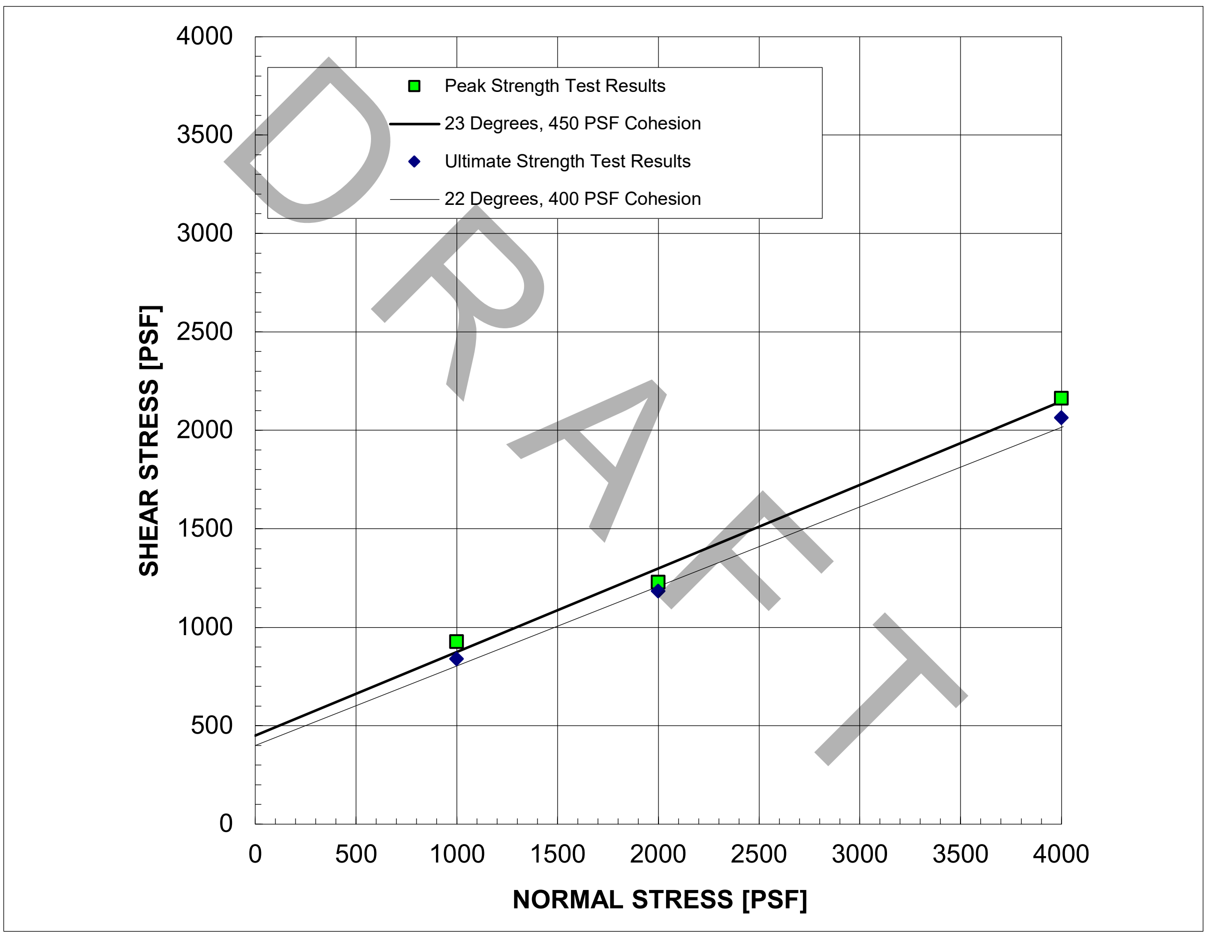
SOIL RESISTIVITY [OHM-CM]	GENERAL DEGREE OF CORROSIVITY TO FERROUS METALS
0 to 1,000	Very Corrosive
1,000 to 2,000	Corrosive
2,000 to 5,000	Moderately Corrosive
5,000 to 10,000	Mildly Corrosive
Above 10,000	Slightly Corrosive

CHLORIDE (Cl) CONTENT [%]	GENERAL DEGREE OF CORROSIVITY TO METALS
0.00 to 0.03	Negligible
0.03 to 0.15	Corrosive
Above 0.15	Severely Corrosive

MAXIMUM DENSITY & OPTIMUM MOISTURE
(ASTM D1557)

SAMPLE ID	DESCRIPTION	MAXIMUM DENSITY [lb/ft^3]	OPTIMUM MOISTURE [%]
CPT-3 @ 1' – 4'	**Lacustrine Deposits**: Dark brown fat clay (CH).	112.9	13.5





SAMPLE: CPT-4 @ 1' - 4'

FILL: Brown fat clay (CL).
(Remolded to ~90% RC @ Optimum).

	PEAK	ULTIMATE
ϕ'	23 °	22 °
C'	450 PSF	400 PSF

STRAIN RATE: 0.0002 IN/MIN
(Sample was consolidated and drained)

	IN-SITU	AS-TESTED
γ_d	100.7 PCF	100.7 PCF
w_c	14.5 %	24.9 %

GROUP DELTA

DIRECT SHEAR TEST RESULTS

Document No. 22-0028
Project No. SD725
FIGURE B-5

Appendix F

Paleontological Resources Technical Memorandum

MEMORANDUM

To:	Michael Haberkorn, Gatzke Dillon & Ballance
From:	Michael Williams, Ph.D, Paleontologist, Dudek
Subject:	SDSU Brawley Sciences Building Project Paleontological Resources Technical Memorandum
Date:	August 25, 2023
cc:	Sarah Lozano, Alexandra Martini, Sarah Siren, Dudek
Attachments:	A – Figures B – Confidential SDNHM Paleontological Records Search Results C – Site Photos

Dudek has conducted an evaluation pursuant to the requirements of the California Environmental Quality Act (CEQA), California Public Resources Code 21000, et seq., to determine the presence of and potential impacts related to paleontological resources associated with construction and operation of the proposed San Diego State University (SDSU) Imperial Valley Campus Brawley Sciences Building Building Project (project or proposed project), located east of Brawley, California. This technical memorandum provides the results of the paleontological resources investigation.

To determine the paleontological sensitivity of the project site, Dudek performed a paleontological resources inventory and preconstruction survey in compliance with the CEQA and Society of Vertebrate Paleontology ([SVP] 2010) guidelines. In addition to reviewing the certified environmental impact report (EIR) prepared for the approved 2003 Campus Master Plan, the inventory consisted of a San Diego Natural History Museum (SDNHM) paleontological records search and a review of geological mapping and geological and paleontological literature. The results of the paleontological records search were negative for paleontological resources within the project site and the one-mile radius buffer; however, the SDNHM indicated that the presence of Lake Cahuilla sediments underlying the project site have high paleontological sensitivity and recommended a complete paleontological mitigation program if planned excavations will impact undisturbed Lake Cahuilla sediments.

1 Project Location and Setting

The project is located at 560 California State Route (SR) 78 (also referred to as Ben Hulse Highway) in Imperial County, east of the City of Brawley (see Attachment A: Figure 1, Project Location). Regional access to the campus is provided by SR 111 and SR 86 to the west and northwest, respectively, and SR 115 to the east. (See Figure 1.) The proposed project site is surrounded by agricultural uses to the north, south, and west. Undeveloped land and a solar farm are located directly east of the proposed project site. The proposed building would be constructed northeast of existing campus Building 101, and the associated parking lot. Project construction staging areas would occupy the area of campus located southeast of the site and north of SR 78 (see Figure 2, and Attachment A: Figure 2 Project Area).

2 Project Description

In September 2003, CSU certified an environmental impact report and approved a Campus Master Plan for development of the SDSU Brawley Campus (Brawley Campus or campus), which would serve as an extension of the existing SDSU Imperial Valley Campus (IVC) located in Imperial County. The IVC is an extension of SDSU's main campus located in San Diego and furthers the university's regional educational mission to provide additional educational opportunities to the outlying communities of Imperial County. The approved Campus Master Plan and certified EIR provided sufficient environmental analysis and authorization necessary for enrollment of up to 850 full-time equivalent (FTE) students and corresponding faculty and staff and a framework for development of the facilities necessary to serve the approved campus enrollment.

The Brawley Campus is approximately 200 acres in size and is located east of the city of Brawley (city). See Figure 1. Currently, the Campus has been partially built out with educational and support facilities, although much of the campus remains undeveloped or used for active agriculture. As noted above, the environmental impacts associated with development of the Brawley Campus, including a student enrollment of up to 850 FTE students, were evaluated at a program level of review in the previously certified 2003 SDSU Imperial Valley Campus Master Plan Project EIR (2003 EIR) (SCH 200251010). In CSU's effort to build out the IVC consistent with the previously approved Campus Master Plan, SDSU now proposes construction and operation of a sciences building that would be located on the Brawley Campus.

The proposed project involves the construction and operation of a sciences building (science, technology, engineering, and mathematics) that would house teaching labs, lecture spaces, faculty/administration offices, research spaces, and conference rooms, as well as mechanical, electrical, and telecom support spaces.

The proposed project site is approximately 3.2-acres in size and the construction staging areas would occupy approximately 1-acre in the area of campus located southeast of the site and north of SR 78. The project includes 61,119 sf of on-site landscaping, including the construction of bio-retention areas to capture stormwater runoff from stormwater drainages systems that will be located throughout the project site. Hardscape improvements will include 41,297 sf of sidewalks and pedestrian walkways, which will connect the project site to existing campus buildings and parking lot.

Additionally, the project would require new points of connection to domestic water, fire water, and sewer lines from existing utility lines to serve the new building, as well as new domestic water line infrastructure. Potable water will be provided by the City of Brawley, as well as sewer and wastewater collection services. New utility infrastructure will also be required to support electrical services for the building, as well as a back-up diesel operated generator.

The proposed project building would have an area of 36,900 gross sf and would be approximately 35 feet in height. The project is expected to be built over the course of 19 months, with construction estimated to begin in 2024. Construction and equipment staging would require 1-acre of space within the campus, directly east of existing Building 101 and the parking lot. The project would involve site preparation, grading, and excavation associated with project construction. Excavation depths are anticipated to be 2-5 feet. Waste (i.e., excavated gravel/soil) generated during project construction would be balanced within the site.

3 Analysis Methodology

The analysis presented here considers the potential environmental impacts of the proposed project relative to existing conditions. Establishment of the project site's existing paleontological conditions have been informed by published geological maps, as well as published and unpublished reports reviewed to identify geological units located on the project site and determine their paleontological sensitivity.

As described above, a paleontological records search request was sent to the SDNHM on October 24, 2022. The records search area included the project site and a one-mile radius buffer. The purpose of the records search was to determine whether there are any known fossil localities in or near the project site to aide in determining whether a paleontological mitigation program is warranted to avoid or minimize potential adverse effects of construction on paleontological resources.

In addition to the records search, Dudek staff conducted an intensive level pedestrian survey of the project site on February 22, 2023, to determine if Lake Cahuilla sediments and/or fossils are present on the surface of the project site.

4 Paleontological Resources

Paleontological resources are the remains or traces of plants and animals that are preserved in the earth's crust, and per SVP (2010) guidelines, are older than written history or older than approximately 5,000 years. They are limited, nonrenewable resources of scientific and educational value and are afforded protection under state laws and regulations. This analysis complies with guidelines and significance criteria specified by CEQA and SVP (2010). Table 1, Paleontological Resource Sensitivity Criteria, provides definitions for high, undetermined, low, and no paleontological resource potential, or sensitivity, as set forth in and by the SVP (2010) Standard Procedures for the Assessment and Mitigation of Adverse Impacts to Paleontological Resources.

Table 1. Paleontological Resource Sensitivity Criteria

Resource Sensitivity / Potential	Definition
High	Rock units from which vertebrate or significant invertebrate, plant, or trace fossils have been recovered are considered to have a high potential for containing additional significant paleontological resources. Rock units classified as having high potential for producing paleontological resources include, but are not limited to, sedimentary formations and some volcaniclastic formations (e. g., ashes or tephras), and some low-grade metamorphic rocks which contain significant paleontological resources anywhere within their geographical extent, and sedimentary rock units temporally or lithologically suitable for the preservation of fossils (e. g., middle Holocene and older, fine-grained fluvial sandstones, argillaceous and carbonate-rich paleosols, cross-bedded point bar sandstones, fine-grained marine sandstones, etc.). Paleontological potential consists of both (a) the potential for yielding abundant or significant vertebrate fossils or for yielding a few significant fossils, large or small, vertebrate, invertebrate, plant, or trace fossils and (b) the importance of recovered evidence for new and significant taxonomic, phylogenetic, paleoecologic, taphonomic, biochronologic, or stratigraphic data. Rock units which contain potentially datable organic remains older than late Holocene, including deposits associated with animal nests or middens, and rock units which may contain new vertebrate deposits, traces, or trackways are also classified as having high potential.
Undetermined Potential	Rock units for which little information is available concerning their paleontological content, geologic age, and depositional environment are considered to have undetermined potential. Further study is necessary to determine if these rock units have high or low potential to contain significant paleontological resources. A field survey by a qualified professional paleontologist (see "definitions" section in this document) to specifically determine the paleontological resource potential of these rock units is required before a paleontological resource impact mitigation program can be developed. In cases where no subsurface data are available, paleontological potential can sometimes be determined by strategically located excavations into subsurface stratigraphy.
Low Potential	Reports in the paleontological literature or field surveys by a qualified professional paleontologist may allow determination that some rock units have low potential for yielding significant fossils. Such rock units will be poorly represented by fossil specimens in institutional collections, or based on general scientific consensus only preserve fossils in rare circumstances and the presence of fossils is the exception not the rule, e. g. basalt flows or Recent colluvium. Rock units with low potential typically will not require impact mitigation measures to protect fossils.
No Potential	Some rock units have no potential to contain significant paleontological resources, for instance high- grade metamorphic rocks (such as gneisses and schists) and plutonic igneous rocks (such as granites and diorites). Rock units with no potential require no protection nor impact mitigation measures relative to paleontological resources.

Source: SVP (2010)

4.1 Regulatory Framework

The California Environmental Quality Act

This paleontological resources evaluation was completed to satisfy the requirements of the California Environmental Quality Act (CEQA). The CEQA Guidelines require that all private and public activities not specifically exempted be evaluated against the potential for environmental impacts, including effects to paleontological resources. Paleontological resources, which are limited, nonrenewable resources of scientific, cultural, and educational value, are recognized as part of the environment under these state guidelines. This study satisfies project requirements in accordance with CEQA (13 PRC [Public Resources Code], 21000 et seq.).

Paleontological resources are explicitly afforded protection by CEQA, specifically in Section VII(f) of CEQA Guidelines Appendix G, the "Environmental Checklist Form," which addresses the potential for adverse impacts to "unique paleontological resource[s] or site[s] or … unique geological feature[s]." This provision covers fossils of significant importance – remains of species or genera new to science, for example, or fossils exhibiting features not previously recognized for a given animal group – as well as localities that yield fossils significant in their abundance, diversity, preservation, and so forth.

California Public Resources Code Section 5097.5

In addition to CEQA's requirements, Public Resources Code Section 5097.5 (Stats 1965, c 1136, p. 2792) regulates removal of paleontological resources from state lands, defines unauthorized removal of fossil resources as a misdemeanor, and requires mitigation of disturbed sites.

4.2 Environmental Setting

Geological Map Review

The project site lies within the Colorado Desert Geomorphic Province, which is bound by a southern extension of the Mojave Desert Geomorphic Province on the east, the Peninsular Ranges Geomorphic Province on the west, the eastern Transverse Ranges and Mojave Desert Geomorphic Provinces to the north, and the United States – Mexico border on the south (CGS 2002).

More specifically, the project site lies within the Salton Trough, a northwesterly- trending tectonic basin located between the Peninsular Ranges on the west and the Chocolate Mountains on the east. The area is characterized by numerous northwest-trending strike-slip faults, including the San Andreas, San Jacinto, and Elsinore faults. Roughly 2,000 square miles of the Salton Basin lie below sea level, and in many respects, the area can be considered a landward extension of the Gulf of California. In fact, if it were not for the modern Colorado River delta damming the sediments, the marine waters of the Gulf of California would extend all the way to Riverside County. The project site lies below sea level.

According to surficial geological mapping by Strand (1962) at a 1:250,000 scale, the project site is underlain by late Pleistocene (approximately 129,000 years ago to 11,700 years ago; Cohen et al. [2022]) to Holocene (<11,700 years ago; Cohen et al. [2022]) lake deposits (map unit Ql). Lake deposits in this area are associated with former Lake Cahuilla.

Literature Review

Repeated inundation and desiccation sequences are recorded in lacustrine and fluvial sediments associated with Lake Cahuilla within the Salton Trough. These freshwater inundation and desiccation events bring with them assemblages of fossils and subfossils, freshwater invertebrates and vertebrates, that provide a snapshot of the biota living in a given location at a time in the distant past.

The late Pleistocene to Holocene (Li and others 2008) Lake Cahuilla sediments have an extensive record of preserving freshwater invertebrate and terrestrial vertebrate taxa. According to stratigraphic sections of boring walls examined by CRM TECH for the nearby Imperial Solar Energy Center West (ISECW) project, sediments derived from Lake Cahuilla vary in thickness from approximately five to fifteen feet and indicate shallow water deposition (Quinn, 2015). Quinn and Dahdul (2014) reported *Anodonta* sp., *Helisoma newberryi*, *Physa humerosa,* and *Tryonia protea* from geotechnical work on the ISECW project; Quinn and Kerridge (2015) reported *Planorbella tenuis*, *Physa humerosa*, *Physa* like *P. wattsi*, *Physa* sp., *Tryonia protea*, *Tryonia* sp., *Fluminicola* sp., and *Anodonta* sp. from boring in the southern part of the ISEC West Project; and Siren (2017) reported *Pyrgulopsis longinqua, P. californiensis, Tryonia porrecta* (*T. protea*), *Physa* sp., *Helisoma* sp., *Ferrissia* sp., *Anodonta californiensis,* and *Chionactus* cf. *Chionactus occipitalis* salvaged during paleontological monitoring for the ISECW project. Finally, Stewart (2008) reported *Tryonia protea, Flumnicola* sp., *Physella* cf. *P. humerosa, Valvata sp., Anodonta californiensis,* unidentified ostracods, cyprinid and centrachid fish, a rodent tibia, and large mammal rib fragment from Lake Cahuilla sediments sampled from a gas turbine plant project in Niland, California.

Paleontological Records Search

The SDNHM paleontological records search results were received on November 4, 2022 (Confidential Attachment B). The SDNHM did not report any fossil localities from within the project site or the one-mile radius buffer; however, they did cite geological mapping by Jennings (1967) and indicated the project site is underlain by late Pleistocene to Holocene Lake Cahuilla sediments that have produced significant paleontological resources in the area and are assigned high paleontological sensitivity. Given Lake Cahuilla sediments have produced significant paleontological resources in the area and are considered to have high paleontological sensitivity or potential, the SDNHM recommended a complete paleontological resource mitigation program if significant excavations are planned that could impact undisturbed Lake Cahuilla Deposits (Confidential Attachment B).

Intensive Pedestrian Survey

Dudek staff conducted an intensive level pedestrian survey of the proposed project site on February 22, 2023. All survey work was conducted employing standard archaeological/paleontological procedures and techniques. During the pedestrian survey, the ground surface was examined for Lake Cahuilla sediments as indicated by the presence of freshwater invertebrate shells.

The project area is flat and has been previously disturbed from the construction of the existing campus structures, parking lot, shaded seating area, earthen irrigation ditches, access dirt roads, storage area, and active agricultural field. Little to no vegetation was observed within the southern section of the proposed building project area and staging area and ground visibility was excellent (100 percent). The northern section of the project area consists of an active agricultural field and ground visibility was fair at (60-70 percent). Within the sciences building project area, a chain-linked fence separates the southern portion from the active agricultural field. A shaded seating area with gravel shows evidence of disturbance from vehicle tire tracks (Attachment C: Photo 1). North of the chain-linked fence is a graded dirt access road (Attachment C: Photo 2), with an earthen irrigation ditch with a culvert pipe to the north of the road (Attachment C: Photo 3). North of the ditch is another dirt access road, and plastic pipes are observed within the cut of the access road and the agricultural field (Attachment C: Photo 4). The northern half of the project area consists of an active agricultural field (Attachment C: Photo 5).

The proposed staging area is located southeast of the proposed sciences building project area. The area is flat, mostly unvegetated, and shows evidence of disturbance from vehicle tire tracks and a chain-linked fence which surrounds the perimeter of the area (Attachment C: Photo 6). Metal, pieces of modern glass, irrigation pipes, and guywire are observed throughout the staging area (Attachment C: Photo 7). More evidence of disturbance can be observed throughout the staging area in the form of bioturbation, erosion, and buried irrigation pipes (Attachment C: Photo 8). No Lake Cahuilla sediments were observed during the survey.

5 Impact Analysis and Conclusions

5.1 Thresholds of Significance

The thresholds of significance used to evaluate the impacts of the proposed project related to paleontological resources are based on Appendix G of the California Environmental Quality Act (CEQA) Guidelines. A significant impact under CEQA would occur if the proposed project would:

a) Directly or indirectly destroy a unique paleontological resource or site or unique geologic feature.

5.2 Impact Analysis

a) Would the project directly or indirectly destroy a unique paleontological resource or site or unique geologic feature

The IS prepared for the 2003 EIR determined that no impacts to unique paleontological resources or sites or unique geologic features would occur.

No paleontological resources were identified within the project site or a one-mile radius buffer as a result of the institutional records search, paleontological survey, or desktop geological and paleontological review. Lake Cahuilla sediments underlying the project site at an undetermined depth have high paleontological sensitivity and disturbed surficial sediments have low paleontological sensitivity. Based on the records search results and map and literature review, the project site has high potential to produce paleontological resources during planned construction activities in areas underlain by Lake Cahuilla sediments. In the event that intact paleontological resources are discovered on the project site, ground-disturbing activities associated with construction of the project, such as grading and large diameter drilling during site preparation and trenching for utilities, have the potential to destroy a unique paleontological resource or site. The potential for project activities to damage paleontological resources during construction would result in a potentially significant impact. Mitigation Measure GEO-1, presented below, would reduce potentially significant impacts to a **less-than-significant** level by requiring preparation of a Paleontological Resources Impact Mitigation Program which would involve pre-construction worker awareness training as well as paleontological monitoring and discovery protocol, treatment, reporting, and collection management.

> GEO-1:Paleontological Resources Impact Mitigation Program and Paleontological Monitoring. Prior to commencement of any grading activity on site, SDSU or its designee shall retain a qualified paleontologist per the Society of Vertebrate Paleontology (SVP) 2010 guidelines to prepare a Paleontological Resources Impact Mitigation Program (PRIMP) for the project. The PRIMP shall be consistent with the SVP 2010 guidelines and outline requirements for: preconstruction meeting attendance and worker environmental awareness training; where paleontological monitoring is required within the project site based on construction plans and/or geotechnical reports; and, procedures for adequate paleontological monitoring and discoveries treatment, including paleontological methods (including sediment sampling for microinvertebrate and microvertebrate fossils), reporting, and collections management. The PRIMP shall also include a statement that any fossil lab or curation costs (if necessary due to fossil recovery) are the responsibility of SDSU or its designee.
>
> In addition, a qualified paleontological monitor shall be on site during initial rough grading and other significant ground-disturbing activities (including augering) in areas underlain by Lake Cahuilla sediments. No paleontological monitoring is necessary during ground disturbance within artificial fill, if determined to be present. In the event that paleontological resources (e.g., fossils) are unearthed during grading, the paleontological monitor will temporarily halt and/or divert grading activity to allow recovery of paleontological resources. The area of discovery will be roped off with a 50-foot radius buffer. Once documentation and collection of the find is completed, the monitor will allow grading to recommence in the area of the find.

6 References

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Jennings, C.W. 1967. Geologic Map of California: Salton Sea Sheet: California Division of Mines and Geology, scale 1:250,000.

Li, C.-L., C.F. You, , T.-L. Ku,, X.-M. Xu,, H.P. Buchheim, N.-J. Wau, R.-W. Wang, and M.-L. Shen. 2008. Isotopic and geochemical evidence of palaeoclimate changes in the Salton Basin, California during the past 20 yrk: 2 87SR/86 ratio in lake tufa as an indicator of connection between the Colorado River and Salton Basin. In Lake Systems, Sedimentary archives climate change and tectonics, EGU General Assembly. Palaeography, Palaeoclimatology, Palaeoecology, 259(2-3):198-212.

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Quinn, H. M., and M. Dahdul. 2014. Paleontological resources monitoring report, Imperial Solar Energy Center West Geotechnical Boring Project. Prepared for: CSOLAR Development, LLC, 1044 N. 115th Street, Suite 400, Omaha, NE 68154, and U. S. Bureau of Land Management, El Centro Field Office, 1661, S. Fourth Street, El. Centro, CA 92243. Prepared by: CRM TECH, 1016 E Cooley Drive, Suite A/B. Colton, CA 92324, and UltraSystems Environmental, Inc., 16431 Scientific Way, Irvine, CA 92618.

Quinn, H. M., and B. Kerridge. 2015. Paleontological Resources Monitoring Report: Imperial Solar Energy Center – West Transmission Line BLM Land prepared by CRM TECH and UltraSystems Environmental Inc: 1-60.

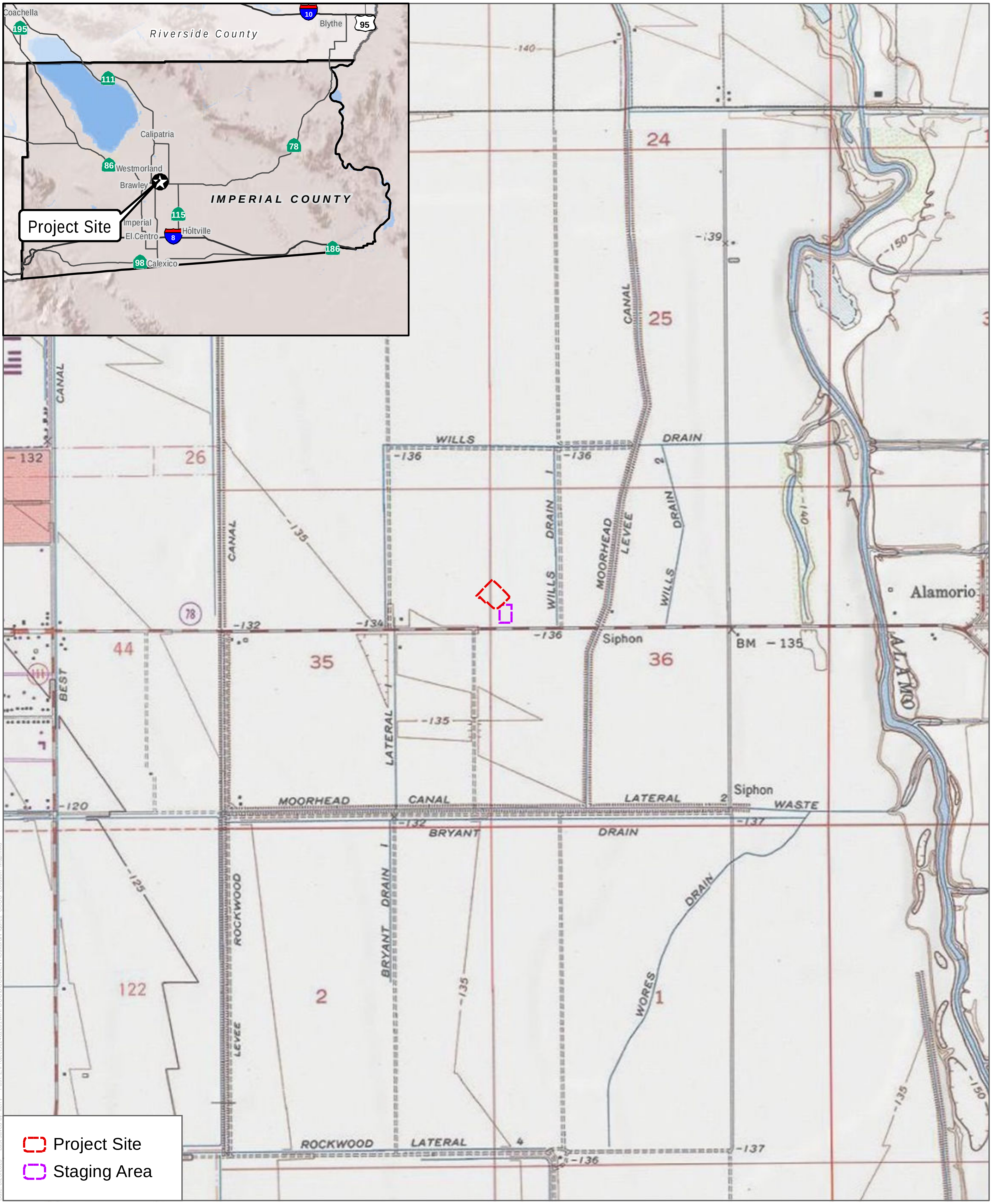
Society of Vertebrate Paleontology (SVP). 2010. Standard Procedures for the Assessment and Mitigation of Adverse Impacts to Paleontological Resources. 11 p. Available; https://vertpaleo.org/wp-content/uploads/2021/01/SVP_Impact_Mitigation_Guidelines-1.pdf.

Stewart, J.D. 2008. Paleontological Resource Monitoring and Mitigation Final Report: Niland Gas Turbine Plant Project. Unpublished report prepared for the Imperial Irrigation District.

Strand, R.G. 1962. Geologic map of California: San Diego – El Centro Sheet: California Division of Mines and Geology, scale 1:250,000.

Attachment A

Figures

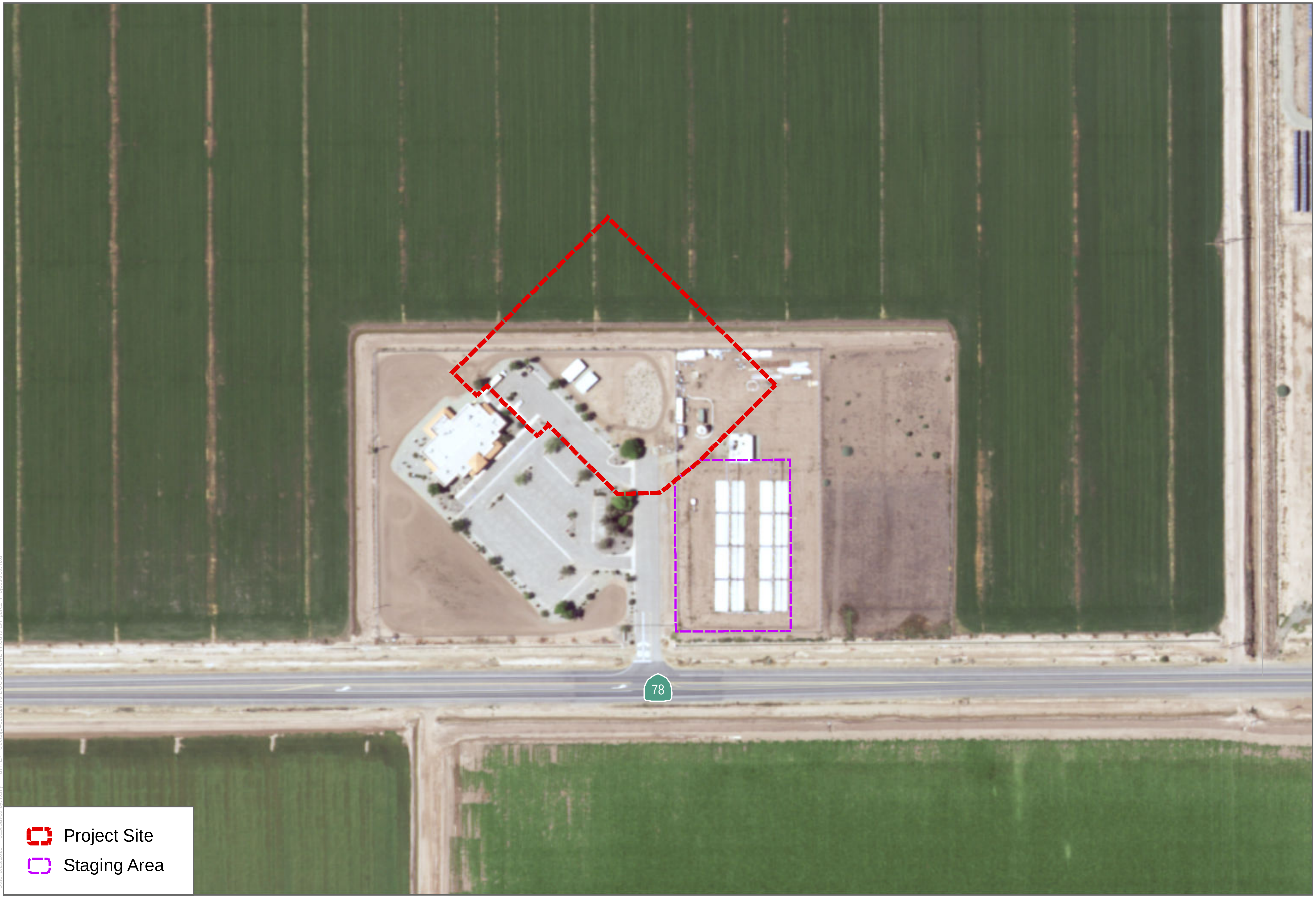


SOURCE: USGS 7.5-Minute Series Alamorio, Quadrangles
Township 13S; Range 14E; Sections 35, 36

DUDEK

0 1,000 2,000 Feet
0 285 570 Meters
1:24,000

FIGURE 1
Project Location
SDSU Brawley Sciences Building Project



SOURCE: NAIP 2020

DUDEK

0 80 160 Feet

FIGURE 2

Project Area

SDSU Brawley Sciences Building Project

Confidential Attachment B

SDNHM Paleontological Records Search Results

Attachment C

Site Photos

Photo 1: View of shaded seating area in the southern half of the project area. View facing west.

Photo 2: View of dirt access road in central portion of the project area. view facing west.

Photo 3: View of earthen irrigation ditch and adjacent dirt roads in the central portion of the project area. View facing west.

Photo 4: View of dirt road and agricultural field in the central portion of the project area. View facing northwest.

Photo 5: View of mowed agriculture field in the northern section of the project area. View facing north.

Photo 6: View of the proposed staging area located in the western section. View facing south.

Photo 7: View of the proposed staging area located in the central section. View facing southeast.

Photo 8: View of the proposed staging area located in the central section. View facing south.

Appendix G

Hazards and Hazardous Materials
Technical Memorandum

MEMORANDUM

To:	Mr. Michael Haberkorn, Gatkze Dillon & Ballance
From:	Audrey Herschberger, Dudek
Subject:	SDSU Brawley Sciences Building Project - Hazards Technical Study
Date:	August 28, 2023
cc:	Sarah Lozano and Kirsten Burrowes, Dudek
Attachments:	A - Figures 1 and 2
	B - Historical Aerial Photographs
	C - Laboratory Report and QA/QC

Dudek has conducted an evaluation pursuant to the requirements of the California Environmental Quality Act (CEQA), California Public Resources Code 21000, et seq., to determine the presence and potential impacts related to hazards and hazardous materials associated with construction and development of the proposed California State University/San Diego State University (CSU/SDSU) Imperial Valley Campus Brawley Sciences Building Project (project or proposed project), located east of Brawley, California. The purpose of this hazards technical study was to determine if there are potential environmental concerns on the project site related to current or historical handling and storage of hazardous materials and/or wastes. This hazards technical memo includes a summary of the project background and environmental setting; a review and summary of regulatory agency records, historical aerial photographs, and surface soil sampling; and evaluation of potential site hazards due to hazardous material pipelines and/or oil and gas wells.

1 Project Location and Setting

The project is located at 560 California State Route (SR) 78 (also referred to as Ben Hulse Highway) in Imperial County, east of the city of Brawley. Regional access to the campus is provided by SR-111 and SR-86 to the west and northwest, respectively, and SR-115 to the east (see Figure 1; all figures can be found in Attachment A). The proposed project site is surrounded by agricultural uses to the north, south, and west. Undeveloped land and a solar farm are located directly east of the proposed project site. The proposed sciences building would be constructed northeast of existing campus Building 101, and the associated parking lot. Project construction staging areas would occupy the area of campus located southeast of the site and north of SR-78 (see Figure 2).

2 Project Description

In September 2003, CSU certified an environmental impact report (EIR) and approved a Campus Master Plan for development of the SDSU Brawley Campus (Brawley campus or campus), which would serve as an extension of the existing SDSU Imperial Valley Campus (IVC) located in Imperial County. The IVC is an extension of SDSU's main campus located in San Diego and furthers the university's regional educational mission to provide additional educational opportunities to the outlying communities of Imperial County. The approved Campus Master Plan and certified EIR provided sufficient environmental analysis and authorization necessary for enrollment of up to 850 full-time equivalent (FTE) students and corresponding faculty and staff, and a framework for development of the facilities necessary to serve the approved campus enrollment.

The Brawley campus is approximately 200 acres in size and is located east of the city of Brawley (city). Currently, the campus has been partially built out with educational and support facilities, although much of the campus remains undeveloped or used for active agriculture. As noted above, the environmental impacts associated with development of the Brawley campus, including a student enrollment up to 850 FTE, were evaluated at a program level of review in the previously certified SDSU Imperial Valley Campus Master Plan Project EIR (2003 EIR) (SCH 200251010). In CSU's effort to build out the IVC consistent with the previously approved Campus Master Plan, SDSU now proposes construction and operation of a sciences building that would be located on the Brawley campus.

The proposed project involves the construction and operation of a sciences building (including STEM activities: science, technology, engineering, and mathematics) that would house teaching labs, lecture spaces, faculty/administration offices, research spaces, and conference rooms, as well as mechanical, electrical, and telecom support spaces. The proposed project does not include/propose any increase in the previously authorized and approved maximum student enrollment of 850 FTE.

The proposed project site is approximately 3.2-acres in size and the construction staging areas would occupy approximately 1 acre in the area of campus located southeast of the site and north of SR-78. The project includes 61,119 sf of on-site landscaping, including the construction of bio-retention areas to capture stormwater runoff from stormwater drainages systems that will be located throughout the project site. Hardscape improvements will include 41,297 sf of sidewalks and pedestrian walkways, which will connect the project site to existing campus buildings and parking lot.

Additionally, the project will require new points of connection to domestic water, fire water, and sewer lines from existing utility lines to serve the new building, as well as new domestic water line infrastructure. Potable water will be provided by the city of Brawley, as well as sewer and wastewater collection services. New utility infrastructure will also be required to support electrical services for the building, as well as a back-up diesel operated generator.

The proposed project building would have an area of 36,900 gross sf and would be approximately 35 feet in height. The project is projected to be built over the course of 19 months, with construction estimated to begin in January 2024. Construction and equipment staging would require 1 acre of space within the campus, directly east of the existing building (Building 101) and parking lot. The project would involve site preparation, grading, and excavation associated with project construction. Excavation depths are anticipated to be 2 to 5 feet. Waste (i.e., excavated gravel/soil) generated during project construction would be balanced within the site.

3 Analysis Methodology

This analysis considers the potential environmental impacts of the proposed project relative to existing conditions. Establishment of the project site's existing hazards and hazardous materials conditions has been prepared using information contained in the previously certified SDSU Imperial Valley Campus Master Plan Project EIR (SDSU 2003), with the information updated, as applicable, through review of existing documents, online environmental regulatory databases, and online historical documents (aerial photographs and topographic maps).

4 Hazards and Hazardous Materials

4.1 Existing Conditions

The majority of the approximately 200-acre Brawley campus is actively used for agriculture, specifically crops, and was historically used for crops from as early as 1953. As agricultural use generally includes the use of pesticides and herbicides, and these compounds were generally unregulated prior to the 1980s, there is a likelihood that pesticide- and herbicide-related contaminants are present in surface soils on the project site. As such, a surface soil sampling was included as part of this hazards technical study.

4.1.1 Topography and Groundwater

The topography of the project site is relatively flat, with an average elevation of approximately 130 feet below mean sea level (Google Earth 2023). Limited groundwater information is available, as there are no groundwater wells on record within 1 mile of the project site (GAMA 2023). The nearest groundwater data are from 1.9 miles west of the project site; shallow groundwater was measured at 20 to 25 feet below ground surface in a monitoring well (SCS Engineers 2023).

4.1.2 Online Regulatory Databases

The following online regulatory databases were searched by Dudek in March 2023.

Cortese List Sites

Government Code Section 65962.5 requires the California Environmental Protection Agency to compile a list of hazardous waste and substances sites (Cortese List). While the Cortese List is no longer maintained as a single list, the following databases provide information that meet the Cortese List requirements:

1. List of hazardous waste and substances sites from the Department of Toxic Substances Control (DTSC) EnviroStor database (California Health and Safety Code Sections 25220, 25242, 25356, and 116395)
2. List of leaking underground storage tank sites by county and fiscal year from the State Water Resources Control Board GeoTracker database (California Health and Safety Code Section 25295)
3. List of solid waste disposal sites identified by the State Water Resources Control Board with waste constituents above hazardous waste levels outside the waste management unit (California Water Code Section 13273[e] and 14 CCR 18051)
4. List of active Cease and Desist Orders and Cleanup and Abatement Orders from the State Water Resources Control Board (California Water Code Sections 13301 and 13304)
5. List of hazardous waste facilities subject to corrective action pursuant to Section 25187.5 of the Health and Safety Code, identified by DTSC

Dudek conducted a search of the above-described databases that provide information on Cortese List sites. No sites were identified on the project site or within 1 mile of the project site.

Non-Cortese List Hazardous Materials Sites

Dudek reviewed other online databases that provide environmental information on release and cleanup cases in the State of California. While these databases are not included in the Cortese List, they may provide additional information regarding potential environmental contamination on the project site. These sites may include military cleanups and voluntary cleanups. Table 1 provides a summary of the databases searched.

Table 1. Non-Cortese Online Database Listings

Database	Details
Department of Toxic Substance Control (DTSC) EnviroStor https://www.envirostor.dtsc.ca.gov/	The DTSC's data management system for tracking cleanup, permitting, enforcement, and investigation efforts at hazardous waste facilities and sites with known contamination or sites where there may be reasons for further investigation.
Regional Water Quality Control Board (RWQCB) GeoTracker http://geotracker.waterboards.ca.gov/	The California RWQCBs' data management system for sites that impact, or have the potential to impact, water quality in California, with emphasis on groundwater. GeoTracker contains records for sites that require cleanup, various unregulated projects, and permitted facilities. Sites include leaking underground storage tanks (LUSTs), Department of Defense, Cleanup Program, Irrigated Lands, Oil and Gas Production, Permitted underground storage tanks (USTs), and Land Disposal Sites.
California Environmental Protection Agency (CalEPA) https://siteportal.calepa.ca.gov/nsite/	The CalEPA Regulated Site Portal is a website that combines data about environmentally regulated sites and facilities in California into a single, searchable database and interactive map. Data sources include California Environmental Reporting System (CERS), EnviroStor, GeoTracker, California Integrated Water Quality System (CIWQS), and Toxics Release Inventory (TRI).
California Geologic Energy Management Division (CalGEM) https://www.conservation.ca.gov/calgem/Pages/WellFinder.aspx	CalGEM online mapping application Well Finder provides the location of oil and gas wells and other types of related facilities throughout the state.
National Pipeline Mapping System Public Viewer (NPMS) https://pvnpms.phmsa.dot.gov/PublicViewer/	NPMS allows the user to view NPMS pipeline, liquefied natural gas plant and breakout tank data, including details and pipeline operator contact information. Gas transmission and hazardous liquid pipeline accidents and incidents going back to 2002 for the entire US can also be viewed.

EnviroStor Database

Dudek reviewed the EnviroStor database, the DTSC's data management system for tracking cleanup, permitting, enforcement, and investigation efforts at hazardous waste facilities and sites with known contamination or sites where there may be reasons for further investigation (DTSC 2023). Non-Cortese listings include Voluntary Cleanup, School Cleanup, Evaluation, School Investigation, Military Evaluation, Tiered Permit, Corrective Actions and Permitted Sites. No sites were identified on the project site or within 1 mile of the project site.

GeoTracker Database

Dudek reviewed the GeoTracker database, the California RWQCB's data management system for sites that impact, or have the potential to impact, water quality in California, with emphasis on groundwater (SWRCB 2023). Non-Cortese listings include Department of Defense, Cleanup Program, Irrigated Lands, Oil and Gas Production, Permitted USTs, and Land Disposal Sites. No sites were identified on the project site or within 1 mile of the project site.

California Environmental Protection Agency

Dudek reviewed the CalEPA's Regulated Site Portal, which contains data on environmentally regulated sites and facilities in California (CalEPA 2023). CalEPA's sites are generally administrative in nature, identifying sites that have environmental permits or that handle hazardous materials or generate hazardous waste, but that do not necessarily have an uncontrolled release of hazardous substances to the environment. No sites were identified on the project site or within 1 mile of the project site.

California Geologic Energy Management Division

Dudek searched the CalGEM database for oil and gas wells (CalGEM 2023). No active oil and gas wells were identified within 1 mile of the project site.

National Pipeline Mapping System

Dudek searched the NPMS and did not identify any pipelines on or adjoining the project site; three north–south trending pipelines were identified approximately 1.2 miles west of the project site along Old Highway 111 (NPMS 2023). Two of the pipelines transport natural gas; the third pipeline is abandoned. One incident associated with excavation work along a natural gas pipeline was identified approximately 1.3 miles west of the project site in 2007. No additional information is provided.

4.1.3 Site History

Historical Summary

Based on a review of the historical aerial photographs, the project site was used for agriculture, specifically row crops, as early as 1953. Between 2002 and 2005, the southern portion of the project site was graded as part of the development of the current campus. Two shade canopies were constructed on the southern portion of the project site as early as 2010. The northern portion of the proposed STEM Building site is still used as agricultural land and has not been graded for development. The proposed staging area remained agricultural row crops until approximately 2018, when the area was graded for development. The staging area currently contains a campus-related agricultural project.

The project site is surrounded by campus property. Campus areas adjoining the project site were used for agriculture since as early as 1953. Development of the campus began between 2002 and 2005, which included Building 101 and the associated parking lot. Projects began on the agricultural land east of Building 101 as early as 2014; these projects required grading of the previously agricultural land. A solar array was constructed on the easternmost portion of the campus, adjacent to Moorhead Canal, between 2012 and 2014.

Surrounding properties include row crops with limited residential/farming properties. These surrounding agricultural uses began as early as 1953.

Historical Aerial Photographs

Dudek reviewed historical aerial photographs obtained from Nationwide Environmental Title Research (NETR 2023) for 1953, 1984, 1996, 2002, 2005, 2010, 2012, 2014, 2018, and 2020 (Attachment B). The photographs provided background information to assess the possibility of past activities that could present environmental concerns. The aerial photographs are described in Table 2.

Table 2. Summary of Aerial Photographs

Date	Project Site and Campus	Adjoining and Surrounding Areas
1953	The project site appears to be developed with row crops, as does the entire campus.	The majority of the area adjoining and surrounding the project site appears to be developed with row crops. Several roads appear throughout the surrounding property. Residential/farming properties appear to the east and west of the project site.
1984	The project site and campus appear similar to the 1953 aerial photograph.	The surrounding property to the east appears developed with a series of small structures. The remaining adjoining and surrounding properties appear similar to the 1953 aerial photograph.
1996	The project site and campus appear similar to the 1984 aerial photograph.	The series of structures to the east are no longer observed. The remaining adjoining and surrounding properties appear similar to the 1984 aerial photograph.
2002	The project site and campus appear similar to the 1996 aerial photograph.	The surrounding property to the east appears further developed with additional buildings and vehicles. The property appears to be a working farm. The remaining adjoining and surrounding properties appear similar to the 1996 aerial photograph.
2005	The southern portion of the project site appears to be graded for development of the campus. The northern portion remains row crops. The construction staging area remains planted with row crops. The campus is under development with Building 101 and the associated parking areas.	The adjoining and surrounding properties appear similar to the 2002 aerial photograph.

Table 2. Summary of Aerial Photographs

Date	Project Site and Campus	Adjoining and Surrounding Areas
	The entirety of Assessor's Parcel No. 047-390-002 has been graded.	
2010	Two canopies appear in the southern corner of the project site, specifically the proposed STEM Building area. The proposed construction staging area remains planted with row crops.	The adjoining and surrounding properties appear similar to the 2005 aerial photograph.
2012	The project site appears similar to the 2010 aerial photograph. Additional grading is observed on the campus to the east of the parking lot. This grading extends onto Assessor's Parcel No. 047-390-003.	The adjoining and surrounding properties appear similar to the 2010 aerial photograph.
2014	The project site appears similar to the 2012 aerial photograph. A solar array has been constructed on the easternmost portion of the campus, adjacent to Moorhead Canal. An agricultural project is observed east of Building 101, north of the proposed construction staging area.	The adjoining and surrounding properties appear similar to the 2012 aerial photograph.
2018	The project site appears similar to the 2014 aerial photograph. The staging area has been graded and now contains multiple agriculture-related structures covering the area.	The adjoining and surrounding properties appear similar to the 2014 aerial photograph.
2020	The project site appears similar to the 2018 aerial photograph. Additional grading is observed east of the proposed construction staging area.	The adjoining and surrounding properties appear similar to the 2018 aerial photograph.

Note: See Attachment B for corresponding photographs for 1953 through 2020.

4.1.4 Soil Sampling

The majority of the campus is actively used for agriculture, specifically crops, and was historically used for crop growth as early as 1953. As agricultural use generally includes the use of pesticides and herbicides, and these compounds were generally unregulated prior to the 1980s, there is a likelihood that pesticide- and herbicide-related contaminants are present in shallow soils on the campus. The northern portion of the proposed STEM Building site is currently ungraded agricultural land, the use of which has not changed since at least 1953. As such, this area has the potential for pesticide- and herbicide-related contamination. The southern portion of the proposed STEM Building site and the proposed construction staging area have been graded. As such, potentially impacted soils have been redistributed, mixed, buried, or removed and therefore are not likely to be present at levels exceeding risk-based thresholds. Dudek generally followed the DTSC Interim Guidance for Sampling Agricultural Properties (DTSC 2008).

All sampling work was conducted under a site-specific health and safety plan (HSP). The HSP was prepared to protect the health and safety of the sampling personnel and the general public during sampling activities. The HSP assessed potential site-related hazards and provided safe operating procedures for personnel and equipment. Site personnel were briefed on the contents of the HSP at the beginning of the sampling event.

Sample Collection

Dudek conducted shallow soil sampling to evaluate the presence of arsenic and organochlorine pesticide contamination in soils at the project site. Three soil samples and one duplicate were collected from the area where the proposed STEM building would be constructed and that is currently being used for agricultural purposes. The sampling was completed on February 28, 2023. The sampling locations are shown in Figure 2. Sampling results are summarized in Table 3, Summary of Analytical Data. The complete results are presented in Attachment C, Laboratory Report.

As noted, a total of four soil samples from three sampling locations were collected during the soil investigation. Soil was collected from the ground surface, with a maximum depth of 6 inches, using a disposable hand trowel for each location. Soil was collected in lab-prepared glass sampling containers, labeled, placed in a sealable plastic bag, logged on a chain-of-custody form, and placed in an ice-chilled cooler. Nitrile gloves were worn during sampling, and changed in between sample locations. Soil samples were shipped to Jones Environmental Inc. to be analyzed for the following constituents:

- Pesticides (organochlorine pesticides) by U.S. Environmental Protection Agency Method 8081A/3546
- Arsenic by U.S. Environmental Protection Agency Method 6010B

Waste materials (i.e., trowels and nitrile gloves) were disposed of in between sample locations.

Results

The intended use of the project site is as a research and instructional facility/building for the SDSU Brawley campus. As such, the laboratory analytical sample results were compared to the San Francisco Bay Regional Water Quality Control Board's 2019 Environmental Screening Levels for residential, commercial, and industrial soils. Sample results for arsenic were also compared using a DTSC guidance document on regional background arsenic concentrations in soil found in Southern California. The analytical sample results are summarized in Table 3.

Table 3. Summary of Analytical Data

Sample Location	Sample ID	Sample Depth (ft bgs)	Sample Date	Arsenic (mg/kg)	Chlorinated Pesticides (µg/kg)
SS-1	SS-1	<0.5	2/28/2023	5.7	ND
SS-2	SS-2	<0.5	2/28/2023	5.7	ND
SS-3	SS-3	<0.5	2/28/2023	5.2	ND
SS-3 (duplicate)	SS-4	<0.5	2/28/2023	5.4	ND
ESL – Residential Soil[1]				0.067	—
ESL – Commercial/Industrial Soil[1]				0.31	—
Southern CA Regional Background Arsenic Concentration in Soil[2]				12	—

Notes: ft bgs = feet below ground surface; mg/kg = milligram per kilogram; µg/kg = microgram per kilogram; ND = Non-detect, analyte not detected at or above the method reporting limit.
Complete results with reporting limits presented in Attachment C.

— = Chlorinated pesticide screening levels range from 0.034 mg/kg to 7,000 mg/kg, based on the individual analyte. All chlorinated pesticide concentrations were found to be below the various applicable screening levels.
1 SFRWQCB 2019.
2 DTSC 2020.

As shown on Table 3, arsenic was detected above the laboratory reporting limits in each of the soil samples, although each detection was below the regional background arsenic concentration in soil. As further discussed below, the background arsenic concentration in soil represents typical regional concentrations, due to the fact that arsenic occurs naturally in soils; levels below the background concentration are not considered to pose a risk to human health or the environment. Ambient concentrations of arsenic can be affected by anthropogenic contributions, naturally occurring metals, and/or site-specific releases, which makes it difficult to determine site-specific risk, as ambient concentrations of arsenic are typically found at much higher concentrations than established regulatory risk-based soil concentrations. To address this, the DTSC has established a regional background concentration of 12 mg/kg in soil for arsenic, used as a screening tool for Southern California sites. This background concentration encompasses anthropogenic and naturally occurring concentrations in shallow soil (DTSC 2020). All of the sample concentrations of arsenic were found to be above applicable regulatory screening levels, but below the DTSC's applicable background concentrations, which are the pertinent levels of concern.

Chlorinated pesticides consist of multiple analytes; none were detected above their associated laboratory reporting limits. Each of the respective samples taken was below the laboratory method detection limits.

Quality Assurance and Quality Control

Quality assurance and quality control measures were performed in the field by the Dudek field sampler and Jones Environmental. Field measures included duplicate sample collection. Laboratory measures included analysis of surrogates, blank samples, and laboratory control samples. The laboratory analytical report is presented in Attachment C. Dudek evaluated the analytical results for quality assurance/quality control, which is included with the laboratory report in Attachment C.

4.1.5 Schools

In March 2023, Dudek consulted the California School Campus Database (GreenInfo Network 2021) and the California School Directory (CDE 2023) to determine if there were any existing or proposed kindergarten through 12th grade schools within 0.25 miles of the project site. No schools were identified.

4.1.6 Airports

In March 2023, Dudek accessed the Airport Land Use Compatibility Plan Imperial County Airports (Imperial County 1996) and reviewed data for the following three airports located within 10 miles of the project site: Brawley Municipal Airport, Imperial County Airport, and Cliff Hatfield Memorial Airport. Imperial County Airport and Cliff Hatfield Memorial Airport are located more than 9 miles from the project site. Brawley Municipal Airport is located approximately 1.5 miles northwest of the project site. According to the Brawley Municipal Airport Land Use Compatibility Map (Imperial County 1996), the project site does not fall within the airport's land use compatibility influence area. According to background data also presented in the Compatibility Plan, the project site does not fall within Brawley Municipal Airport's Noise Impact Area (Imperial County 1996).

The Federal Aviation Administration has filing requirements for proposed structures that vary based on factors such as height, location, and proximity to an airport, as defined by Title 14 of the Code of Federal Regulations, Part 77.9. Based on the analysis of the project using the Federal Aviation Administration Obstruction Evaluation/Airport Airspace Analysis Notice Criteria Tool (FAA 2023), using an assumed maximum building height of 35 feet, the project does not exceed Notice Criteria.

4.1.7 Fire Hazards

The project site and campus are located within an area mapped as Local Responsibility Area (LRA) by CAL FIRE (CAL FIRE 2007). The LRA designation means that fire response services for the project site and campus are within the responsibility of a local, rather than state agency, in this case the Imperial County Fire Department. As to the hazard severity designation, the project site and entire campus are located within a non-wildland/non-urban area and are not identified by CAL FIRE as within a mapped Fire Hazard Severity Zone (FHSZ). The nearest identified FHSZ areas are over 30 miles southwest (a Moderate Fire Hazard Severity Zone near Ocotillo), and over 45 miles northwest (a Very High Fire Hazard Severity Zone near the community of Oasis) (CAL FIRE 2007). Specific to the provision of fire services on the campus, Imperial County contracts with the City of Brawley for the provision of fire services to areas within the City's sphere of influence (SOI), which includes in the Brawley campus. Further, mutual aid agreements have been established with all cities in the county to address incidents requiring equipment and/or personnel beyond the City Fire Department's capacity to respond (City of Brawley and Imperial County LAFCo 2012).

5 Hazards and Hazardous Materials Impact Analysis and Conclusions

5.1 Thresholds of Significance

The thresholds of significance used to evaluate the impacts of the proposed project related to hazards and hazardous materials are based on Appendix G of the California Environmental Quality Act (CEQA) Guidelines (Cal. Code Regs., Title 14, Chptr. 3, sections 15000-15387.). A significant impact under CEQA would occur if the proposed project would:

a) Create a significant hazard to the public or the environment through the routine transport, use, or disposal of hazardous materials.

b) Create a significant hazard to the public or the environment through reasonably foreseeable upset and accident conditions involving the release of hazardous materials into the environment.

c) Emit hazardous emissions or handle hazardous or acutely hazardous materials, substances, or waste within one-quarter mile of an existing or proposed school.

d) Be located on a site which is included on a list of hazardous materials sites compiled pursuant to Government Code § 65962.5 and, as a result, would it create a significant hazard to the public or the environment.

e) For a project located within an airport land use plan or, where such a plan has not been adopted, within two miles of a public airport or public use airport, would the project result in a safety hazard or excessive noise for people residing or working in the project area.

f) Impair implementation of or physically interfere with an adopted emergency response plan or emergency evacuation plan.

g) Expose people or structures, either directly or indirectly, to a significant risk of loss, injury or death involving wildland fires.

5.2 Hazards and Hazardous Materials Impact Analysis

a) Would the project create a significant hazard to the public or the environment through the routine transport, use, or disposal of hazardous materials?

Section 3.3 of the Campus Master Plan EIR determined that previous uses of the Brawley site did not result in hazardous material impacts. While hazardous materials, such as petroleum products, were stored on the Brawley site, and pesticides were historically applied, a Phase I ESA and Phase II ESA were prepared for the 2003 EIR that confirmed no contamination was present in collected samples. Mitigation adopted as part of the EIR recommended hazardous materials be removed from the Brawley site and that additional sampling be conducted following removal of hazardous materials (See MMRP page 11-2).[1] With implementation of the mitigation, impacts were determined to be less than significant.

The proposed project involves construction and operation of a new campus building generally within the footprint of Building 102, as identified in the Campus Master Plan and previously analyzed in the 2003 EIR. The new building would be located within the existing Brawley campus boundaries. The northern portion of the proposed project area is presently used for agricultural purposes, similar to the land use observed during the 2003 EIR; and, the southern portion of the proposed project site and the proposed staging area have been graded as part of the existing Brawley campus development. As such, as part of the analysis presented here, additional soil samples were collected in the existing agricultural land to verify the presence or absence of hazardous materials, such as organochlorine compounds and arsenic. As discussed in Section 4.1.4, Soil Sampling, three samples collected in the remaining agricultural areas did not contain concentrations of organochlorine compounds above environmental screening levels for unrestricted land use (ESLs; SFRWQCB 2019), nor did they contain arsenic levels above regional background concentrations (DTSC 2020). As such, there is no evidence of hazardous materials due to former agricultural land use that would affect the proposed project. While construction and operation of the proposed project would require routine use, transport, and disposal of hazardous materials, such as paints, greases, cleaning supplies, and small amounts of diesel and oil (for heavy equipment), as well as any chemicals that may be used as part of the educational function of the proposed project, these materials are regulated under federal, state, and local laws, rules, and regulations such that the use, transport, and disposal must be documented and, if quantities exceed reportable thresholds (55 gallons of liquid, 200 cubic feet of gas, or 500 pounds of a solid), additional reporting and safety measures are required to ensure there are no significant hazards to the public or environment. As such this impact would be **less than significant,** and no additional mitigation is required.

[1] 3.3 **Hazardous Materials/Public Safety Mitigation Measures** included on Page 11-2 of the 2003 EIR: (1) The Phase I ESA recommends that any identified hazardous materials shall be removed from the site. (2) The Phase II ESA recommends additional soil sampling following removal of the hazardous wastes to confirm the absence of elevated concentrations of removed wastes (e.g. petroleum hydrocarbons in the vicinity of the 55-gallon waste oil storage drum located in the partially covered shed on the southwestern portion of the property).

b) Would the project create a significant hazard to the public or the environment through reasonably foreseeable upset and accident conditions involving the release of hazardous materials into the environment?

Section 3.3 of the Campus Master Plan EIR determined that previous uses of the Brawley site did not result in hazardous material impacts. As discussed in Significance Standard A, mitigation provided in the 2003 EIR recommended hazardous materials be removed from the Brawley site and recommended additional sampling be conducted following removal of hazardous materials (See MMRP page 11-2, Footnote 1). With implementation of the mitigation, impacts were determined to be less than significant.

As discussed above in Significance Standard A, soil samples were collected in the agricultural land that would underlie the proposed STEM building to verify the presence or absence of hazardous materials, and no evidence of hazardous materials related to former agricultural land use that may impact the proposed project was found. Also discussed in Significance Standard A, while construction and operation of the proposed project would require the use of hazardous materials, such as paints, greases, cleaning supplies, and small amounts of diesel and oil (for heavy equipment), as well as any chemicals that may be used as part of the educational function of the proposed project, these materials are regulated under federal, state, and local laws, rules, and regulations such that quantities in excess of reportable thresholds (55 gallons of liquid, 200 cubic feet of gas, or 500 pounds of a solid) require additional reporting and safety measures to ensure there are no significant hazards to the public or environment. These measures may include, but are not limited to, emergency response plans, spill prevention plans, and reporting of both stored materials and response measures to the local response agency, either the Certified Unified Program Agency and/or the local fire department. As such this impact would be **less than significant** and no additional mitigation is required.

c) Would the project emit hazardous emissions or handle hazardous or acutely hazardous materials, substances, or waste within one-quarter mile of an existing or proposed school?

Section 3.3 of the Campus Master Plan EIR determined that previous uses of the Brawley site did not result in hazardous material impacts. As discussed in Significance Standard A, the mitigation in the 2003 EIR recommended hazardous materials be removed from the Brawley site and recommended additional sampling following removal of any hazardous materials (See MMRP page 11-2).[2] With implementation of the mitigation, impacts were determined to be less than significant.

As previously stated in Section 4.1.5, Schools, there are no current nor proposed K-12 schools within 0.25 miles of the proposed project. As such, **no impact** would occur, and no additional mitigation is required.

d) Would the project be located on a site that is included on a list of hazardous materials sites compiled pursuant to Government Code Section 65962.5 and, as a result, would it create a significant hazard to the public or the environment?

Impacts related to whether the project would be located on a site that is included on a hazardous materials site were evaluated in Section 3.3, Hazardous Materials/Public Safety, of the Campus Master Plan 2003 EIR. A search for hazardous materials sites was conducted as part of the EIR; the Brawley site was not

[2] See footnote 1.

identified on any regulatory databases and impacts were determined to be less than significant. As such, mitigation was not required.

An updated search was prepared, as discussed in Section 4.1.2, Online Regulatory Databases, as part of the current analysis. The Brawley site was not identified on a hazardous materials site regulatory database, nor were any sites identified near the Brawley site with hazardous materials that potentially could impact the environmental condition of the proposed project. As such, **no impact** would occur, and no mitigation is required.

e) ***For a project located within an airport land use plan or, where such a plan has not been adopted, within two miles of a public airport or public use airport, would the project result in a safety hazard or excessive noise for people residing or working in the project area?***

Impacts related to the project's location relative to an airport land use plan or within 2 miles of a public use airport were evaluated in Section 3.1, Land Use and Planning, of the Campus Master Plan EIR. The EIR identified the northwesternmost extremity of the Brawley campus as located within Zone D of the Airport Land Use Compatibility Plan (ALUCP). The EIR determined construction and operation of the university campus would not be considered hazardous to aircraft and, therefore, the Brawley campus would not conflict with the ALUCP. Accordingly, impacts were determined to be less than significant and mitigation was not required.

A review of nearby airports was completed as part of the current analysis, as discussed in Section 4.1.6, Airports. The proposed project would not be located within any current ALUCP boundaries, nor would construction of the proposed project require notification to FAA under 14 CFR Part 77.9. As such, **no impact** would occur.

f) ***Would the project impair implementation of or physically interfere with an adopted emergency response plan or emergency evacuation plan?***

The Initial Study (IS) prepared as part of the Campus Master Plan EIR determined that no impact would occur. Additionally, as discussed in Chapter 3.7, Public Services/Utilities, of the EIR, the proposed Brawley campus was not anticipated to significantly increase demand for emergency services as the campus was expected to provide campus security and emergency services. SDSU would enter into a mutual aid agreement with the City of Brawley for fire and police services to ensure adequate response and services. Mitigation was not required.

At the time of the 2003 EIR, the nearest primary fire agency providing assistance to the Brawley campus area was the City of Calipatria Station, 10 miles and 15 minutes north of the Brawley campus. Currently, the nearest fire station to the campus is the Brawley Fire Department Station 2, located 2.5 miles and 7 response minutes away. This response time is better than that evaluated in the 2003 EIR, and as such, emergency response has improved. As described in Section 4.1.7, Fire Hazards, Imperial County contracts with the city of Brawley through a mutual aid agreement for the provision of fire services to areas within the city's SOI, including the Brawley campus. As such, the Imperial County Fire Department would continue to provide assistance to the city of Brawley, as discussed in the 2003 EIR. The proposed project would not impact evacuation routes, as there is no proposed construction or shutdown of CA-78. As such, **no impact** would occur, and no additional mitigation is required.

g) Would the project expose people or structures, either directly or indirectly, to a significant risk of loss, injury or death involving wildland fires?

The IS prepared as part of the Campus Master Plan EIR determined that no impact would occur. As discussed in Section 4.1.7, Fire Hazards, the proposed project is located within a non-wildland/non-urban area, for which there is no identified wildfire hazard. As such, **no impact** would occur. For additional discussion related to potential wildfire impacts, please refer to Section 6, Wildfire Impact Analysis and Conclusions, below.

6 Wildfire Impact Analysis and Conclusions

6.1 Thresholds of Significance

The thresholds of significance used to evaluate the impacts of the proposed project related to wildfire are based on Appendix G of the California Environmental Quality Act (CEQA) Guidelines (Cal. Code Regs., Title 14, Chptr. 3, sections 15000-15387.). Based on Appendix G, if the proposed project would be located in or near state responsibility areas or lands classified as very high fire hazard severity zones, the proposed project would result in a potentially significant impact if the project would result in any of the following:

a) Substantially impair an adopted emergency response plan or emergency evacuation plan.

b) Due to slope, prevailing winds, and other factors, exacerbate wildfire risks, and thereby expose project occupants to pollutant concentrations from a wildfire or the uncontrolled spread of a wildfire.

c) Require the installation or maintenance of associated infrastructure (such as roads, fuel breaks, emergency water sources, power lines or other utilities) that may exacerbate fire risk or that may result in temporary or ongoing impacts to the environment.

d) Expose people or structures to significant risks, including downslope or downstream flooding or landslides, as a result of runoff, post-fire slope instability, or drainage changes.

6.2 Wildfire Impact Analysis

a) ***Would the project be located in or near state responsibility areas or lands classified as very high fire hazard severity zones and do any of the following:***

Substantially impair an adopted emergency response plan or emergency evacuation plan; due to slope, prevailing winds, and other factors, exacerbate wildfire risks, and thereby expose project occupants to pollutant concentrations from a wildfire or the uncontrolled spread of a wildfire; require the installation or maintenance of associated infrastructure (such as roads, fuel breaks, emergency water sources, power lines or other utilities) that may exacerbate fire risk or that may result in temporary or ongoing impacts to the environment; and/or expose people or structures to significant risks, including downslope or downstream flooding or landslides, as a result of runoff, post-fire slope instability, or drainage changes.

Impacts related to wildfire were introduced as part of the CEQA Guidelines Appendix G in 2019. As such, the wildfire thresholds described in Appendix G were not previously evaluated in the 2003 EIR or IS.

As described in Section 4.1.7, Fire Hazards, applicable mapping of the project site shows that the site is not located within the SRA or a Very High Fire Hazard Severity Zone (VHFHSZ) (CAL FIRE 2007; the 2007 mapping is the current mapping). The nearest mapped fire hazard severity zones are located approximately 30 miles southwest and 45 miles northwest of the project site. Additionally, because the project site is located within the city of Brawley's sphere of influence (SOI), mutual aid agreements between the city and Imperial County have been entered into to ensure that adequate fire protection and services are provided to the project site by the City Fire Department.

Because the project site is not located in or near state responsibility areas or lands classified as VHFHSZ, it is not necessary to address the other inquiries presented in Appendix G. However, for information purposes, the following additional information is provided.

As described above, the project does not propose any closures of SR-78 nor any modifications to existing emergency access or evacuation routes. Because the site is not located in or near an area presenting wildfire hazard conditions, the project is not anticipated to exacerbate wildfire risk and therefore result in exposure to pollutant concentrations or the spread of a wildfire. The project would also not involve installation or maintenance of infrastructure that may exacerbate fire risk. Further, the project and larger campus is located on a relatively flat site with no known previous fire events. As a result, the potential to expose people or structure to significant risk associated with post-fire conditions is not anticipated.

Furthermore, construction and operation of the project would comply with all required building, fire, and safety code standards (e.g., Titles 19 and 24 of the California Code of Regulations and the California Health and Safety Code). As such, the project is not expected to exacerbate any wildfire risks, which may expose onsite occupants to pollutant concentrations from a wildfire or the uncontrolled spread of a wildfire. For the reasons presented here, no impact related to wildfire would occur as a result of development of the project.

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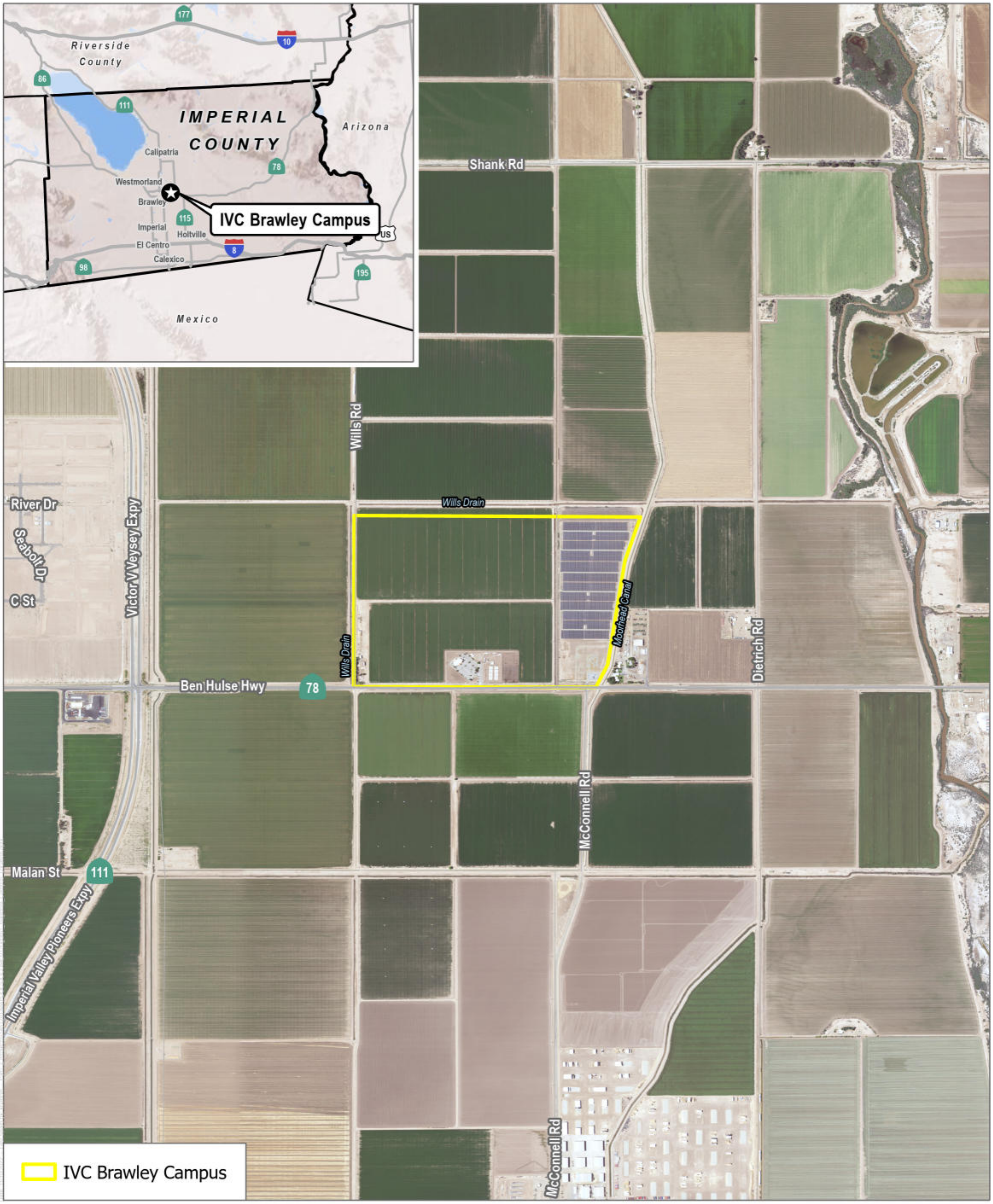
Attachment A
Figures 1 and 2



SOURCE: NAIP 2020, Open Streets Map 2019

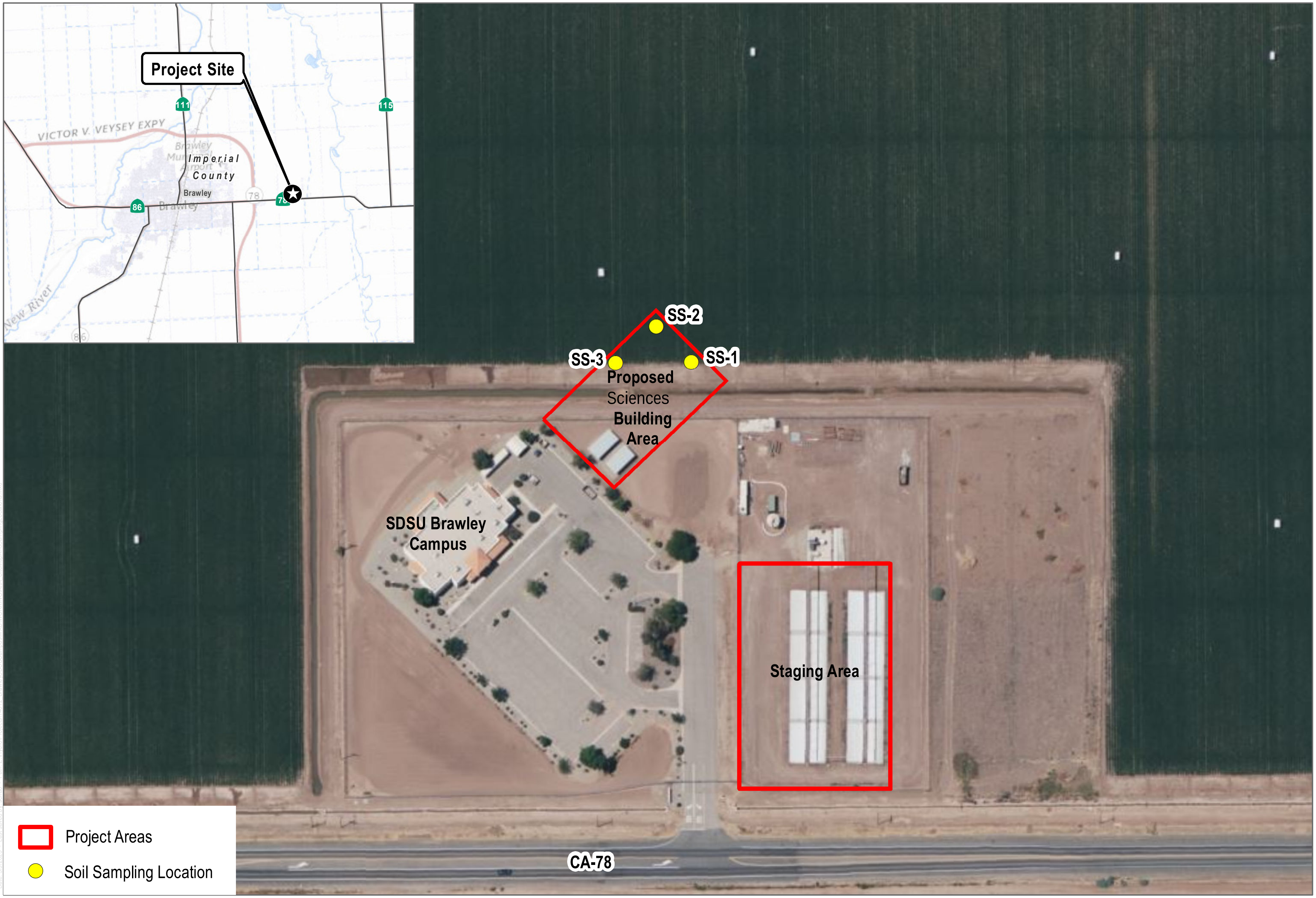
FIGURE 1

Regional/Campus Location

SDSU Brawley Sciences Building Project

DUDEK

1,000 Feet



SOURCE: Bing Maps

DUDEK

0 100 200 Feet

Figure 2

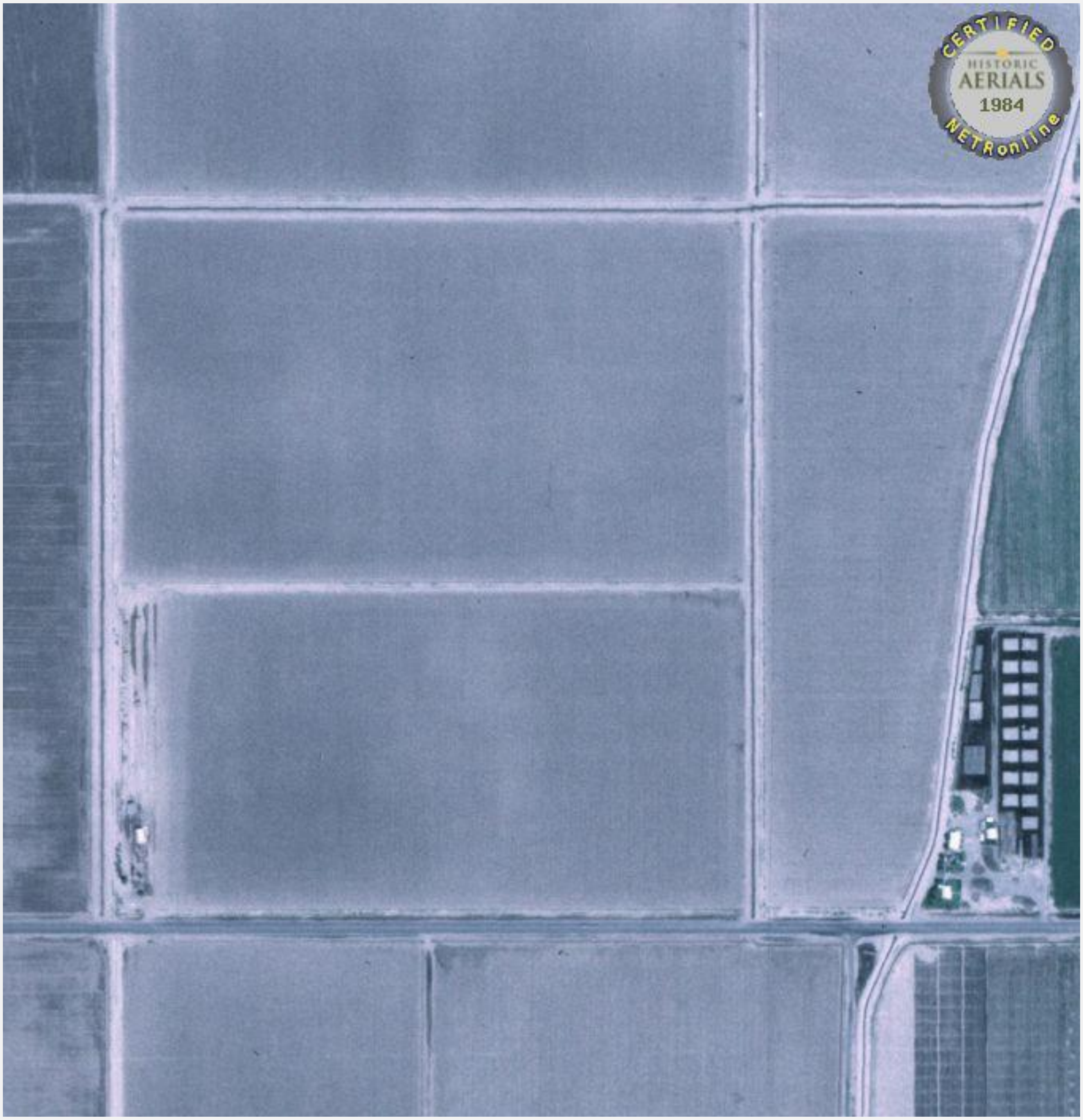
Site Map and Sampling Locations

SDSU Brawley Sciences Building Project Hazards Technical Memo

Attachment B

Historical Aerial Photographs

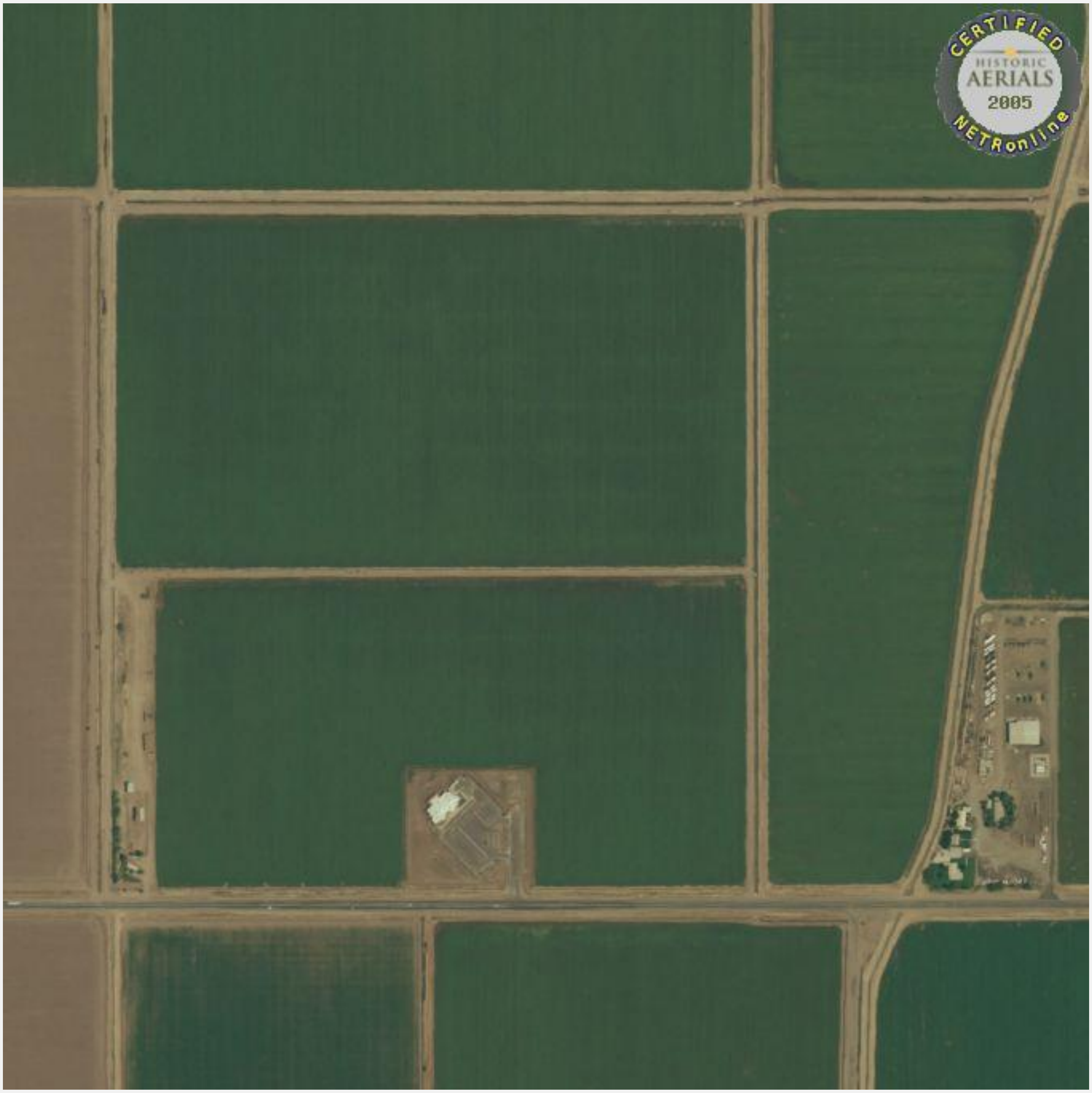
1953 Aerial Photograph: Project Site and SDSU Brawley Campus



1984 Aerial Photograph: Project Site and SDSU Brawley Campus

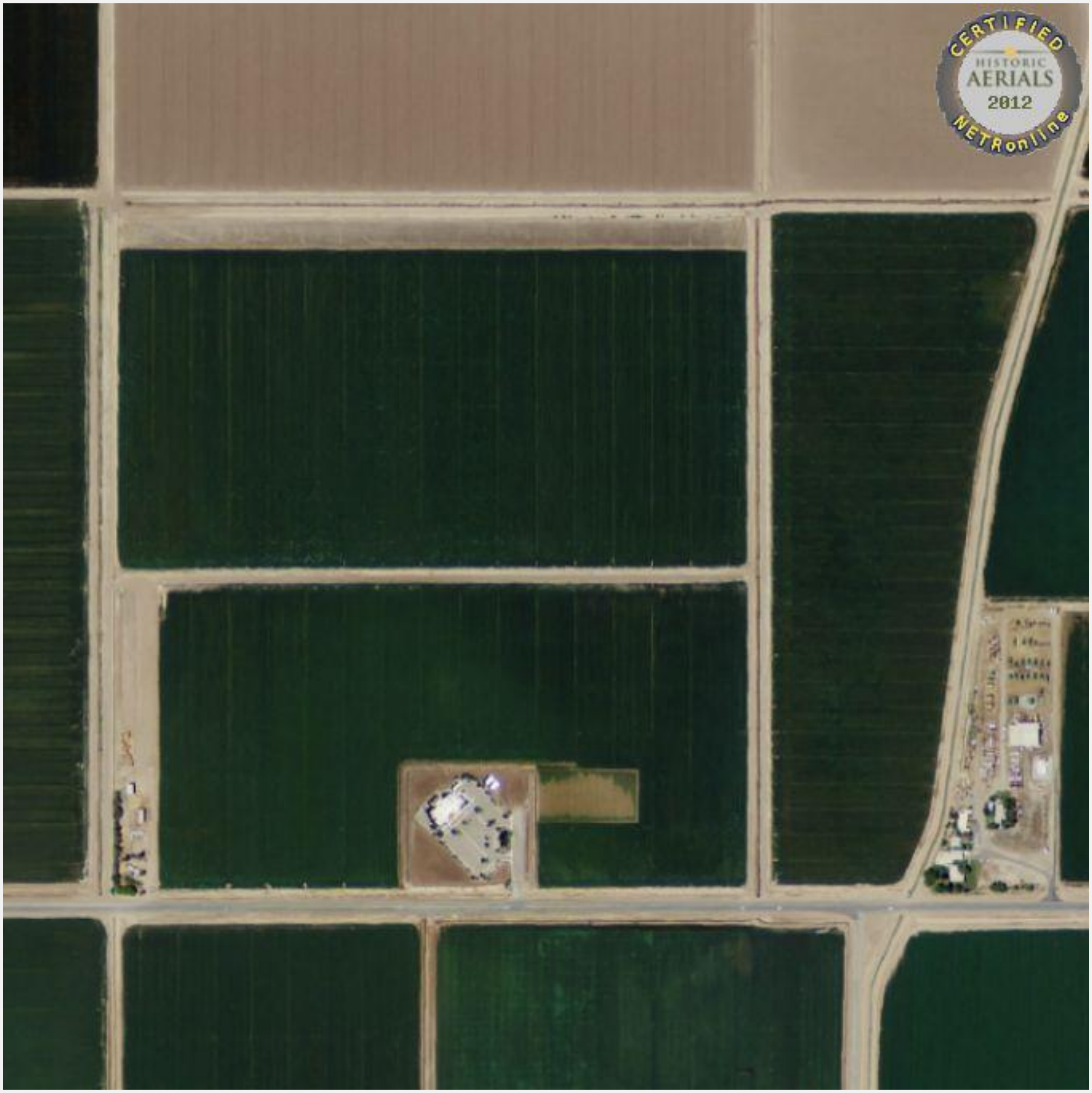
1996 Aerial Photograph: Project Site and SDSU Brawley Campus

2002 Aerial Photograph: Project Site and SDSU Brawley Campus



2005 Aerial Photograph: Project Site and SDSU Brawley Campus

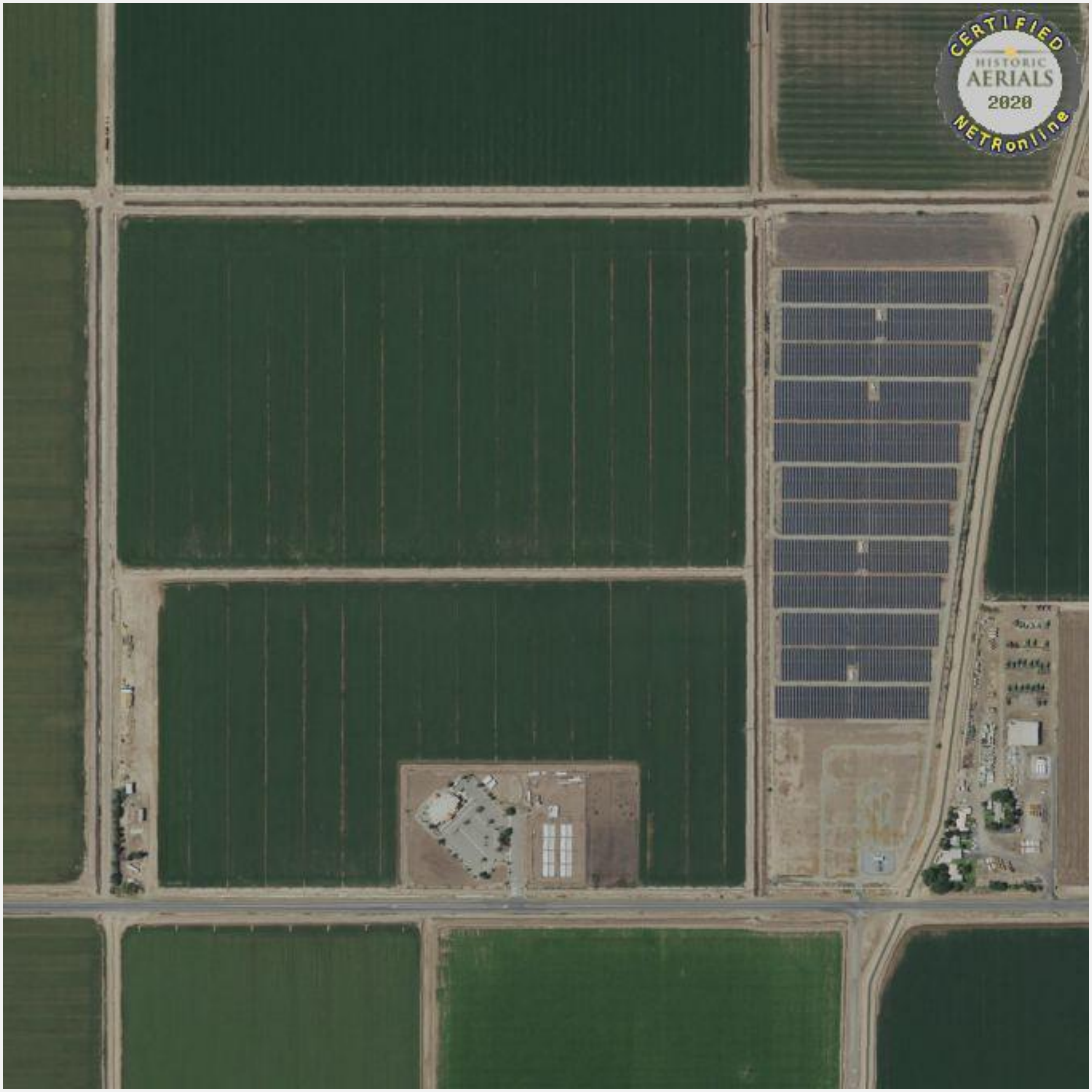
2010 Aerial Photograph: Project Site and SDSU Brawley Campus



2012 Aerial Photograph: Project Site and SDSU Brawley Campus

2014 Aerial Photograph: Project Site and SDSU Brawley Campus

2018 Aerial Photograph: Project Site and SDSU Brawley Campus



2020 Aerial Photograph: Project Site and SDSU Brawley Campus

Attachment C

Laboratory Report and QA/QC

714-449-9937
562-646-1611
11007 FOREST PLACE
SANTA FE SPRINGS, CA 90670
WWW.JONESENV.COM

08 March 2023

Audrey Herschberger
Dudek & Associates
605 Third Street
Encinitas, CA 92024

Re: SDSU-Brawley Campus

Enclosed are the results of analyses for samples received by the laboratory on 03/01/23. If you have any questions concerning this report, please feel free to contact me.

Sincerely,

Colby Wakeman
Lab Director

JONES ENVIRONMENTAL, INC.

11007 FOREST PLACE
SANTA FE SPRINGS, CA 90670
714-449-9937 PHONE
562-646-1611 FAX

Dudek & Associates	Project: SDSU-Brawley Campus	
605 Third Street	Project Number: 14812	Reported
Encinitas, CA 92024	Project Manager: Audrey Herschberger	03/08/23 10:12

ANALYTICAL REPORT FOR SAMPLES

Sample ID	Laboratory ID	Matrix	Date Sampled	Date Received
SS-1	JEI230487-01	Soil	02/28/2023 11:39	03/01/2023 10:17
SS-2	JEI230487-02	Soil	02/28/2023 11:56	03/01/2023 10:17
SS-3	JEI230487-03	Soil	02/28/2023 12:09	03/01/2023 10:17
SS-4	JEI230487-04	Soil	02/28/2023 12:26	03/01/2023 10:17

DETECTIONS SUMMARY

Sample ID: SS-1 **Laboratory ID:** JEI230487-01

Analyte	Result	Reporting Limit	Units	Method	Notes
Arsenic, As	5.7	5.0	mg/kg	EPA 6010	

Sample ID: SS-2 **Laboratory ID:** JEI230487-02

Analyte	Result	Reporting Limit	Units	Method	Notes
Arsenic, As	5.7	5.0	mg/kg	EPA 6010	

Sample ID: SS-3 **Laboratory ID:** JEI230487-03

Analyte	Result	Reporting Limit	Units	Method	Notes
Arsenic, As	5.2	5.0	mg/kg	EPA 6010	

Sample ID: SS-4 **Laboratory ID:** JEI230487-04

Analyte	Result	Reporting Limit	Units	Method	Notes
Arsenic, As	5.4	5.0	mg/kg	EPA 6010	

Jones Environmental, Inc.

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Colby Wakeman
Lab Director

11007 FOREST PLACE
SANTA FE SPRINGS, CA 90670
714-449-9937 PHONE
562-646-1611 FAX

Dudek & Associates 605 Third Street Encinitas, CA 92024	Project: SDSU-Brawley Campus Project Number: 14812 Project Manager: Audrey Herschberger	Reported 03/08/23 10:12

SS-1
JEI230487-01(Soil)

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
Arsenic, As by EPA 6010									
Arsenic, As	5.7	5.0	mg/kg	1	QC2303059		03/06/23	EPA 6010	
Chlorinated Pesticides by GC/ECD by EPA 8081									
alpha-BHC	ND	10	µg/kg	1	QC2303062		03/02/23	EPA 8081	
beta-BHC	ND	10	µg/kg	"	"		"	"	
gamma-BHC (Lindane)	ND	10	µg/kg	"	"		"	"	
Heptachlor	ND	10	µg/kg	"	"		"	"	
delta-BHC	ND	10	µg/kg	"	"		"	"	
Aldrin	ND	10	µg/kg	"	"		"	"	
Heptachlor epoxide	ND	10	µg/kg	"	"		"	"	
gamma-Chlordane	ND	10	µg/kg	"	"		"	"	
alpha-Chlordane	ND	10	µg/kg	"	"		"	"	
Endosulfan I	ND	10	µg/kg	"	"		"	"	
4,4'-DDE	ND	10	µg/kg	"	"		"	"	
Dieldrin	ND	10	µg/kg	"	"		"	"	
Endrin	ND	10	µg/kg	"	"		"	"	
4,4'-DDD	ND	10	µg/kg	"	"		"	"	
Endosulfan II	ND	10	µg/kg	"	"		"	"	
4,4'-DDT	ND	10	µg/kg	"	"		"	"	
Endrin aldehyde	ND	10	µg/kg	"	"		"	"	
Endosulfan sulfate	ND	10	µg/kg	"	"		"	"	
Methoxychlor	ND	20	µg/kg	"	"		"	"	
Endrin ketone	ND	10	µg/kg	"	"		"	"	
Toxaphene	ND	20	µg/kg	"	"		"	"	
Technical Chlordane	ND	20	µg/kg	"	"		"	"	
Surrogate: TCMX	*70.96 %*	*30 - 120*							
Surrogate: Decachlorobiphenyl	*95.65 %*	*30 - 120*							

JONES ENVIRONMENTAL, INC.

11007 FOREST PLACE
SANTA FE SPRINGS, CA 90670
714-449-9937 PHONE
562-646-1611 FAX

Dudek & Associates 605 Third Street Encinitas, CA 92024	Project: SDSU-Brawley Campus Project Number: 14812 Project Manager: Audrey Herschberger	Reported 03/08/23 10:12

SS-2
JEI230487-02(Soil)

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
Arsenic, As by EPA 6010									
Arsenic, As	5.7	5.0	mg/kg	1	QC2303059		03/06/23	EPA 6010	
Chlorinated Pesticides by GC/ECD by EPA 8081									
alpha-BHC	ND	10	µg/kg	1	QC2303062		03/02/23	EPA 8081	
beta-BHC	ND	10	µg/kg	"	"		"	"	
gamma-BHC (Lindane)	ND	10	µg/kg	"	"		"	"	
Heptachlor	ND	10	µg/kg	"	"		"	"	
delta-BHC	ND	10	µg/kg	"	"		"	"	
Aldrin	ND	10	µg/kg	"	"		"	"	
Heptachlor epoxide	ND	10	µg/kg	"	"		"	"	
gamma-Chlordane	ND	10	µg/kg	"	"		"	"	
alpha-Chlordane	ND	10	µg/kg	"	"		"	"	
Endosulfan I	ND	10	µg/kg	"	"		"	"	
4,4'-DDE	ND	10	µg/kg	"	"		"	"	
Dieldrin	ND	10	µg/kg	"	"		"	"	
Endrin	ND	10	µg/kg	"	"		"	"	
4,4'-DDD	ND	10	µg/kg	"	"		"	"	
Endosulfan II	ND	10	µg/kg	"	"		"	"	
4,4'-DDT	ND	10	µg/kg	"	"		"	"	
Endrin aldehyde	ND	10	µg/kg	"	"		"	"	
Endosulfan sulfate	ND	10	µg/kg	"	"		"	"	
Methoxychlor	ND	20	µg/kg	"	"		"	"	
Endrin ketone	ND	10	µg/kg	"	"		"	"	
Toxaphene	ND	20	µg/kg	"	"		"	"	
Technical Chlordane	ND	20	µg/kg	"	"		"	"	
Surrogate: TCMX	*65.40 %*	*30 - 120*							
Surrogate: Decachlorobiphenyl	*87.63 %*	*30 - 120*							

Jones Environmental, Inc.

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Colby Wakeman
Lab Director

Jones Environmental, Inc.

11007 FOREST PLACE
SANTA FE SPRINGS, CA 90670
714-449-9937 PHONE
562-646-1611 FAX

Dudek & Associates	Project: SDSU-Brawley Campus	
605 Third Street	Project Number: 14812	Reported
Encinitas, CA 92024	Project Manager: Audrey Herschberger	03/08/23 10:12

SS-3
JEI230487-03(Soil)

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
Arsenic, As by EPA 6010									
Arsenic, As	5.2	5.0	mg/kg	1	QC2303059		03/06/23	EPA 6010	
Chlorinated Pesticides by GC/ECD by EPA 8081									
alpha-BHC	ND	10	µg/kg	1	QC2303062		03/02/23	EPA 8081	
beta-BHC	ND	10	µg/kg	"	"		"	"	
gamma-BHC (Lindane)	ND	10	µg/kg	"	"		"	"	
Heptachlor	ND	10	µg/kg	"	"		"	"	
delta-BHC	ND	10	µg/kg	"	"		"	"	
Aldrin	ND	10	µg/kg	"	"		"	"	
Heptachlor epoxide	ND	10	µg/kg	"	"		"	"	
gamma-Chlordane	ND	10	µg/kg	"	"		"	"	
alpha-Chlordane	ND	10	µg/kg	"	"		"	"	
Endosulfan I	ND	10	µg/kg	"	"		"	"	
4,4'-DDE	ND	10	µg/kg	"	"		"	"	
Dieldrin	ND	10	µg/kg	"	"		"	"	
Endrin	ND	10	µg/kg	"	"		"	"	
4,4'-DDD	ND	10	µg/kg	"	"		"	"	
Endosulfan II	ND	10	µg/kg	"	"		"	"	
4,4'-DDT	ND	10	µg/kg	"	"		"	"	
Endrin aldehyde	ND	10	µg/kg	"	"		"	"	
Endosulfan sulfate	ND	10	µg/kg	"	"		"	"	
Methoxychlor	ND	20	µg/kg	"	"		"	"	
Endrin ketone	ND	10	µg/kg	"	"		"	"	
Toxaphene	ND	20	µg/kg	"	"		"	"	
Technical Chlordane	ND	20	µg/kg	"	"		"	"	
Surrogate: TCMX	*75.49 %*	*30 - 120*							
Surrogate: Decachlorobiphenyl	*95.59 %*	*30 - 120*							

Jones Environmental, Inc.

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Colby Wakeman
Lab Director

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Dudek & Associates 605 Third Street Encinitas, CA 92024	Project: SDSU-Brawley Campus Project Number: 14812 Project Manager: Audrey Herschberger	Reported 03/08/23 10:12

SS-4
JEI230487-04(Soil)

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
Arsenic, As by EPA 6010									
Arsenic, As	5.4	5.0	mg/kg	1	QC2303059		03/06/23	EPA 6010	
Chlorinated Pesticides by GC/ECD by EPA 8081									
alpha-BHC	ND	10	µg/kg	1	QC2303062		03/02/23	EPA 8081	
beta-BHC	ND	10	µg/kg	"	"		"	"	
gamma-BHC (Lindane)	ND	10	µg/kg	"	"		"	"	
Heptachlor	ND	10	µg/kg	"	"		"	"	
delta-BHC	ND	10	µg/kg	"	"		"	"	
Aldrin	ND	10	µg/kg	"	"		"	"	
Heptachlor epoxide	ND	10	µg/kg	"	"		"	"	
gamma-Chlordane	ND	10	µg/kg	"	"		"	"	
alpha-Chlordane	ND	10	µg/kg	"	"		"	"	
Endosulfan I	ND	10	µg/kg	"	"		"	"	
4,4'-DDE	ND	10	µg/kg	"	"		"	"	
Dieldrin	ND	10	µg/kg	"	"		"	"	
Endrin	ND	10	µg/kg	"	"		"	"	
4,4'-DDD	ND	10	µg/kg	"	"		"	"	
Endosulfan II	ND	10	µg/kg	"	"		"	"	
4,4'-DDT	ND	10	µg/kg	"	"		"	"	
Endrin aldehyde	ND	10	µg/kg	"	"		"	"	
Endosulfan sulfate	ND	10	µg/kg	"	"		"	"	
Methoxychlor	ND	20	µg/kg	"	"		"	"	
Endrin ketone	ND	10	µg/kg	"	"		"	"	
Toxaphene	ND	20	µg/kg	"	"		"	"	
Technical Chlordane	ND	20	µg/kg	"	"		"	"	
Surrogate: TCMX	*40.45 %*	*30 - 120*							
Surrogate: Decachlorobiphenyl	*46.33 %*	*30 - 120*							

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Colby Wakeman
Lab Director

JONES ENVIRONMENTAL, INC.

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562-646-1611 FAX

Dudek & Associates 605 Third Street Encinitas, CA 92024	Project: SDSU-Brawley Campus Project Number: 14812 Project Manager: Audrey Herschberger	Reported 03/08/23 10:12

Arsenic, As by EPA 6010 - Quality Control

Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	%REC Limits	Notes
Batch QC2303059 - EPA 6010										
CCV 1										
Arsenic, As	1.1	5.0	%	1		106	90 - 110		110	
LCS 1										
Arsenic, As	196	5.0	%	200		98	80 - 120			
LCSD 1										
Arsenic, As	189	5.0	%	200		94	80 - 120	3.95	120	
Method Blank 1										
Arsenic, As	ND	5.0	mg/kg							

Dudek & Associates 605 Third Street Encinitas, CA 92024	Project: SDSU-Brawley Campus Project Number: 14812 Project Manager: Audrey Herschberger	Reported 03/08/23 10:12

Chlorinated Pesticides by GC/ECD by EPA 8081 - Quality Control

Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	%REC Limits	Notes
Batch QC2303062 - EPA 8081										
CCV 1										
alpha-BHC	59	10	%	50		117	80 - 120		120	
Heptachlor	59	10	%	50		118	80 - 120		120	
Aldrin	58	10	%	50		115	80 - 120		120	
Heptachlor epoxide	59	10	%	50		118	80 - 120		120	
gamma-Chlordane	54	10	%	50		109	80 - 120		120	
Endosulfan I	59	10	%	50		119	80 - 120		120	
4,4'-DDE	117	10	%	100		117	80 - 120		120	
Dieldrin	120	10	%	100		120	80 - 120		120	
Endrin	118	10	%	100		118	80 - 120		120	
4,4'-DDD	116	10	%	100		116	80 - 120		120	
Endosulfan II	107	10	%	100		107	80 - 120		120	
4,4'-DDT	107	10	%	100		107	80 - 120		120	
Endrin ketone	116	10	%	100		116	80 - 120		120	
LCS 1										
alpha-BHC	126	10	%	100		126	60 - 140			
Heptachlor	124	10	%	100		124	60 - 140			
Aldrin	125	10	%	100		125	60 - 140			
Heptachlor epoxide	129	10	%	100		129	60 - 140			
gamma-Chlordane	117	10	%	100		117	60 - 140			
Endosulfan I	128	10	%	100		128	60 - 140			
4,4'-DDE	134	10	%	100		134	60 - 140			
Dieldrin	135	10	%	100		135	60 - 140			
Endrin	123	10	%	100		123	60 - 140			
4,4'-DDD	135	10	%	100		135	60 - 140			
Endosulfan II	138	10	%	100		138	60 - 140			
4,4'-DDT	129	10	%	100		129	60 - 140			
Endrin ketone	137	10	%	100		137	60 - 140			
Surrogate: TCMX		*118.68 %*	*30 - 120*							
Surrogate: Decachlorobiphenyl		*119.22 %*	*30 - 120*							

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562-646-1611 FAX

Dudek & Associates 605 Third Street Encinitas, CA 92024	Project: SDSU-Brawley Campus Project Number: 14812 Project Manager: Audrey Herschberger	Reported 03/08/23 10:12

Chlorinated Pesticides by GC/ECD by EPA 8081 - Quality Control

Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	%REC Limits	Notes
Batch QC2303062 - EPA 8081										
LCSD 1										
alpha-BHC	118	10	%	100		118	60 - 140	6.45	140	
Heptachlor	122	10	%	100		122	60 - 140	2.02	140	
Aldrin	120	10	%	100		120	60 - 140	3.60	140	
Heptachlor epoxide	124	10	%	100		124	60 - 140	3.54	140	
gamma-Chlordane	118	10	%	100		118	60 - 140	0.42	140	
Endosulfan I	120	10	%	100		120	60 - 140	6.11	140	
4,4'-DDE	122	10	%	100		122	60 - 140	8.82	140	
Dieldrin	133	10	%	100		133	60 - 140	1.69	140	
Endrin	121	10	%	100		121	60 - 140	1.13	140	
4,4'-DDD	128	10	%	100		128	60 - 140	5.02	140	
Endosulfan II	134	10	%	100		134	60 - 140	3.10	140	
4,4'-DDT	123	10	%	100		123	60 - 140	4.96	140	
Endrin ketone	139	10	%	100		139	60 - 140	1.05	140	
Surrogate: TCMX		*111.28 %*	*30 - 120*							
Surrogate: Decachlorobiphenyl		*117.40 %*	*30 - 120*							
Method Blank 1										
alpha-BHC	ND	10	µg/kg							
beta-BHC	ND	10	µg/kg							
gamma-BHC (Lindane)	ND	10	µg/kg							
Heptachlor	ND	10	µg/kg							
delta-BHC	ND	10	µg/kg							
Aldrin	ND	10	µg/kg							
Heptachlor epoxide	ND	10	µg/kg							
gamma-Chlordane	ND	10	µg/kg							
alpha-Chlordane	ND	10	µg/kg							
Endosulfan I	ND	10	µg/kg							
4,4'-DDE	ND	10	µg/kg							
Dieldrin	ND	10	µg/kg							
Endrin	ND	10	µg/kg							
4,4'-DDD	ND	10	µg/kg							
Endosulfan II	ND	10	µg/kg							
4,4'-DDT	ND	10	µg/kg							
Endrin aldehyde	ND	10	µg/kg							
Endosulfan sulfate	ND	10	µg/kg							

11007 FOREST PLACE
SANTA FE SPRINGS, CA 90670
714-449-9937 PHONE
562-646-1611 FAX

Dudek & Associates 605 Third Street Encinitas, CA 92024	Project: SDSU-Brawley Campus Project Number: 14812 Project Manager: Audrey Herschberger	Reported 03/08/23 10:12

Chlorinated Pesticides by GC/ECD by EPA 8081 - Quality Control

Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	%REC Limits	Notes
Batch QC2303062 - EPA 8081										
Method Blank 1										
Methoxychlor	ND	20	µg/kg							
Endrin ketone	ND	10	µg/kg							
Toxaphene	ND	20	µg/kg							
Technical Chlordane	ND	20	µg/kg							
Surrogate: TCMX		*118.69 %*	*30 - 120*							
Surrogate: Decachlorobiphenyl		*117.00 %*	*30 - 120*							

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Colby Wakeman
Lab Director

Dudek & Associates 605 Third Street Encinitas, CA 92024	Project: SDSU-Brawley Campus Project Number: 14812 Project Manager: Audrey Herschberger	Reported 03/08/23 10:12

Notes and Definitions

DET	Analyte DETECTED
ND	Analyte NOT DETECTED at or above the reporting limit
NR	Not Reported
dry	Sample results reported on a dry
RPD	Relative Percent Difference
E	Estimated Concentration; concentration exceeds calibration range.
LCC	Leak Check Compound
MDL	Compound Reported to Method Detection Limit
I	Recovery outside of acceptable limits. LCS/LCSD recoveries and %RSD were within QC limits, therefore data was accepted.

JONES ENVIRONMENTAL, INC.

11007 Forest Pl.
Santa Fe Springs, CA 90670
(714) 449-9937
reports@jonesenv.com
www.jonesenv.com

Chain-of-Custody Record

Client: Dudek

Date: 2/28/2023

Project Name: SDSU - Brawley Campus

Client Project #: 14812

Project Address: 560 CA-78
Brawley, CA 92227

Email: aherschberger@dudek.com

Phone: 971-930-1706

Report To: Audrey Herschberger

Sampler: Stephanie Chao, SC

Turn Around Requested:
- ☐ Immediate Attention - 200%
- ☐ Rush 24 Hours - 100%
- ☐ Rush 48 Hours - 50%
- ☐ Rush 72 Hours - 25%
- ☐ Rush 96 Hours - 10%
- ☑ Normal - No Surcharge

LAB USE ONLY

Jones Project # JE230487

Page 1 of 1

Sample Container / Preservative Abbreviations

AS - Acetate Sleeve
SS - Stainless Steel Sleeve
BS - Brass Sleeve
G - Glass
AB - Amber Bottle
P - Plastic
SOBI - Sodium Bisulfate
MeOH - Methanol
HCl - Hydrochloric Acid
HNO3 - Nitric Acid
O - Other (See Notes)

Report Options
EDD ____
EDF* - 10% Surcharge____
*Global ID ____________

3.5

Analysis Requested

Sample ID	Sample Collection Date	Sample Collection Time	Laboratory Sample ID	Preservative	Sample Container	Sample Matrix: Soil (S), Sludge (SL), Aqueous (A), Free Product (FP)	EPA 8081A	EPA 6010B									Number of Containers	Notes & Special Instructions
SS-1	2/28/23	11:39	1 JE1230487-01	–	G	S	/	/									1	Arsenic ONLY by EPA 6010B-JC 030323
SS-2	2/28/23	11:56	2 JE1230487-02	–	G	S	/	/									1	
SS-3	2/28/23	12:09	3 JE1230487-03	–	G	S	/	/									1	
SS-4	2/28/23	12:26	4 JE1230487-04	–	G	S	/	/									1	

Relinquished By (Signature)	Printed Name	Received By (Signature)	Printed Name
[signature]	Stephanie Chao		
Company: Dudek	Date: 2/28/23 Time: 3:16 pm	Company	Date / Time
Relinquished By (Signature)	Printed Name	Received By Laboratory (Signature): [signature]	Printed Name: Kiara T.
Company	Date: / Time	Company: Jones	Date: 3/1/23 Time: 1010

4 Total Number of Containers

Client signature on this Chain of Custody form constitutes acknowledgement that the above analyses have been reqested, and the information provided herein is correct and accurate.

QUALITY CONTROL

Laboratory Data Validation

In accordance with the principles for data validation presented in the U.S. Environmental Protection Agency (U.S. EPA) National Functional Guidelines for Organic Laboratory Data Review, Dudek reviewed the sampling data in the following areas to evaluate potential impact on data quality:

- Analytical Holding Times
- Continuing Calibration Verification Sample
- Laboratory Control Sample/Laboratory Control Sample Duplicate
- Surrogate Compound Recovery

A total of 4 soil samples were analyzed. The soil samples were analyzed for arsenic by EPA 6010 as well as chlorinated pesticides by EPA 8081, by Jones Environmental, Inc. labs.

The analytical data obtained during the sampling event are considered to be usable for the intended monitoring purposes. Below is a summary of the validation results.

Technical Holding Times and Sample Preservation

All samples were analyzed within the required hold times.

The temperature measured for the sample cooler was between 0-6°C and therefore met laboratory guidelines.

Laboratory and Field Blanks

A method blank was run on each batch of soil samples, one for each sample batch up. For this sampling event, one method blank was analyzed for arsenic and another was analyzed for chlorinated pesticides.

No arsenic or chlorinated pesticides were identified above the laboratory reporting limits in the method blanks for the soil sample batches.

Surrogate Spikes

Two surrogates were spiked and analyzed for the soil samples analyzed for the chlorinated pesticides screen. The percent recoveries of surrogates were within associated control limits.

Matrix Spike/Matrix Duplicate Spikes

There were no matrix spike/matrix spike duplicate (MS/MSD) samples run for these samples.

Continuing Calibration Verification Samples

A continuing calibration verification sample was analyzed for arsenic and another for chlorinated pesticides for the soil samples. All percent recoveries and/or RPDs for the CCV samples were within their associated limits; thus, the data are acceptable.

Laboratory Control Samples

One LCS/LCSD sample was analyzed for arsenic and another for chlorinated pesticides for the soil samples. All percent recoveries and/or RPDs for the LCS/LCSD samples were within their associated limits; thus, the data are acceptable.

Duplicate Samples

One duplicate sample/duplicate pair was collected and analyzed during this sampling event (samples SS-3 and SS-4, both collected from soil sample location SS-3). The sample was analyzed for arsenic and chlorinated pesticides. The relative percent difference between the original and duplicate sample was not calculated for arsenic or chlorinated pesticides as the reported concentrations were less than reporting limits for chlorinated pesticides and less than five times the reporting limit for arsenic.

Appendix H

Hydrology and Water Quality Technical Memorandum

MEMORANDUM

To:	Michael Haberkorn, Gatzke Dillon & Ballance
From:	Perry Russell, Dudek
Subject:	SDSU Brawley Sciences Building Project Technical Memo – Hydrology and Water Quality
Date:	August 16, 2023
cc:	Sarah Lozano, Kirsten Burrowes, Dudek
Attachments:	Figures

Dudek has conducted an evaluation pursuant to the requirements of the California Environmental Quality Act (CEQA), California Public Resources Code 21000, et seq., to determine the presence and potential impacts related to hydrology and water quality associated with the proposed San Diego State University (SDSU) Imperial Valley Campus Brawley Sciences Building Project (proposed project or Project), located east of Brawley, California. This technical memorandum provides the results of the hydrology and water quality investigation.

1 Project Location and Setting

The project is located at 560 California State Route (SR) 78 (also referred to as Ben Hulse Highway) in Imperial County, east of the city of Brawley. Regional access to the campus is provided by SR 111 and SR 86 to the west and northwest, respectively, and SR 115 to the east (See Figure 1). The proposed project site is surrounded by agricultural uses to the north, south, and west. Undeveloped land and a solar farm are located directly east of the proposed project site. The proposed Sciences Building would be constructed northeast of existing campus Building 101, and the associated parking lot. Project construction staging areas would occupy the area of campus located southeast of the site and north of SR 78 (See Figure 2).

2 Project Description

In September 2003, CSU certified an environmental impact report and approved a Campus Master Plan for development of the SDSU Brawley Campus (Brawley Campus or campus), which would serve as an extension of the existing SDSU Imperial Valley Campus (IVC), located in Imperial County. The IVC is an extension of SDSU's main campus located in San Diego and furthers the university's regional educational mission to provide additional educational opportunities to the outlying communities of Imperial County. The approved Campus Master Plan and certified environmental impact report (EIR) provided sufficient environmental analysis and authorization necessary for enrollment of up to 850 full-time equivalent (FTE) students and corresponding faculty and staff and a framework for development of the facilities necessary to serve the approved campus enrollment.

The Brawley Campus is approximately 200 acres in size and is located east of the city of Brawley (city). Currently, the Campus has been partially built out with educational and support facilities, although much of the campus remains undeveloped or used for active agriculture. As noted above, the environmental impacts associated with development of the Brawley Campus, including a student enrollment up to 850 FTE, were evaluated at a program level of review in the previously certified 2003 SDSU Imperial Valley Campus Master Plan Project EIR (2003 EIR) (SCH 200251010). In CSU's effort to build out the IVC consistent with the previously approved Campus Master

Plan, SDSU now proposes construction and operation of sciences research and instruction facility that would be located on the Brawley Campus.

The proposed project involves the construction and operation of a sciencesbuilding (science, technology, engineering, and mathematics) that would house teaching labs, lecture spaces, faculty/administration offices, research spaces, and conference rooms, as well as mechanical, electrical, and telecom support spaces.

The proposed project site is approximately 3.2-acres in size and the construction staging areas would occupy approximately 1-acre in the area of campus located southeast of the site and north of SR 78. The project includes 61,119 sf of on-site landscaping, including the construction of bio-retention areas to capture stormwater runoff from stormwater drainages systems that will be located throughout the project site. Hardscape improvements will include 41,297 sf of sidewalks and pedestrian walkways, which will connect the project site to existing campus buildings and parking lot.

Additionally, the project will require new points of connection to domestic water, fire water, and sewer lines from existing utility lines to serve the new building, as well as new domestic water line infrastructure. Potable water will be provided by the city of Brawley, as well as sewer and wastewater collection services. New utility infrastructure will also be required to support electrical services for the building, as well as a back-up diesel operated generator.

The proposed project building would have an area of 36,900 gross sf and be approximately 35 feet in height. The project is projected to be built over the course of 19 months, with construction estimated to begin in January 2024. Construction and equipment staging would require 1-acre sf of space within the campus, directly east of the existing building (Building 101) and parking lot. The project would involve site preparation, grading, and excavation associated with project construction. Excavation depths are anticipated to be 2 to 5 feet. Waste (i.e., excavated gravel/soil) generated during project construction would be balanced within the site.

3 Analysis Methodology

The analysis presented here considers the potential environmental impacts of the proposed project relative to existing conditions. Establishment of the project site's existing hydrology and water quality conditions has been prepared using information contained in the previously certified 2003 EIR (SDSU 2003), combined with updated information, as applicable, from the California Department of Water Resources (DWR), U.S. Geological Survey (USGS), Federal Emergency Management Agency (FEMA), Imperial County General Plan (Water Element), and Imperial County General Plan EIR.

4. Hydrology and Water Quality

4.1 Existing Conditions

Hydrology and Drainage

Water used to irrigate virtually the entire Imperial Valley (valley) originates from the Colorado River. Local drainage patterns within the valley have been altered through agricultural activities. The Imperial Irrigation District (IID) maintains approximately 1,600 miles of irrigation drainage structures, which collect surface water runoff and subsurface drainage from some 32,200 miles of agriculture (tile) drains and channel the flow into the New River and Alamo River, which ultimately drain to the Salton Sea. The canals and laterals are often open and unprotected (SDSU 2003).

Surface runoff from the Brawley Campus flows northeast at a gradient of 0.1% (SDSU 2003) toward the Wills Drain, which in turn flows into the Alamo River, located approximately 1 mile east of the campus.

Water Quality

The Brawley Campus is located in the Colorado River Basin (Basin), under jurisdiction of the California Regional Water Quality Control Board, Colorado Region (RWQCB). The Basin encompasses the eastern portions of San Bernardino, Riverside, and San Diego counties and all of Imperial County. The Imperial Valley Planning Area is comprised of 2,500 square miles in the southern portion of the Region. The West Basin (the portion of the Basin that does not drain to the Colorado River) contains the Alamo River, New River, and some Imperial Valley agricultural drains. These surface water features are among the most contaminated and poorest quality water resources in the State. The New River, located approximately 3 miles northwest of the Brawley Campus and one of the few natural surface drainage features in the region, has a total dissolved solids (TDS) concentration between 2,000 and 4,000 parts per million and is classified as brackish rather than fresh water. The New River flows into Imperial Valley from Mexico with very high loads of sewage and industrial waste. As the New River flows through Imperial Valley, drainage from agricultural operations dramatically increases its flows. The New River is considered to be unsuitable for either domestic or agricultural uses.

Surface runoff from the Brawley Campus drains northeast toward the Wills Drain and Alamo River, which has generally better water quality than the New River but also is unsuitable for domestic or agricultural use (SDSU 2003). In accordance with state policy for water quality control, the RWQCB employs a range of beneficial use definitions for surface waters, groundwater basins, marshes, and mudflats that serve as the basis for establishing water quality objectives and discharge conditions and prohibitions. The RWQCB Colorado River Basin Plan has identified existing and potential beneficial uses supported by the key surface water drainages throughout its jurisdiction. Beneficial uses of the Imperial Valley Drains and the Alamo River include freshwater replenishment, water contact recreation (limited to fishing), non-contact water recreation, warm freshwater habitat, wildlife habitat, hydropower generation (potential), and preservation of rare, threatened, or endangered species (RWQCB 2019).

Under Clean Water Act Section 303(d), the State of California is required to develop a list of impaired water bodies that do not meet water quality standards and objectives. The Alamo River water quality impairments include sedimentation/siltation, toxaphene, chlorpyrifos, selenium, toxicity, polychlorinated biphenyls (PCBs), chlordane, diazinon, Escherichia coli (E. coli), chloride, cypermethrin, Enterococcus, malathion, dichlorodiphenyltrichloroethane (DDT), dieldrin, cyhalothrin, and lambda (SWRCB 2023a).

A Total Maximum Daily Load (TMDL) defines how much of a specific pollutant/stressor a given water body can tolerate and still meet relevant water quality standards. The RWQCB has developed TMDLs for select reaches of water bodies. According to the State Water Resources Control Board (SWRCB), the primary cause of water quality impairment in the Salton Sea is the heavy use of pesticides in the late 1900s, and the closed-sink nature of the Basin that prevents migration and dissolution of the particles. Though the use of these pesticides has diminished significantly in the last 20 years, the SWRCB has implemented a number of TMDLs to address these water quality issues. Since many of the pollutants present, such as pesticides, are attached to sediments, sediment management practices plays important roles in reducing the compounds. As a result, an Alamo River Pathogen TMDL was adopted by the RWQCB on June 27, 2001, approved by the SWRCB on February 19, 2002, approved by the Office of Administrative Law on May 3, 2002, and approved by the U.S. Environmental Protection Agency on June 28, 2002. This TMDL addresses sedimentation and siltation in the Alamo River (SWRCB 2023a).

Flooding

Flooding occurs in varying degrees throughout Imperial County. Floodwaters rise either from sudden downpours or as a result of slow heavy precipitation. Hazardous flooding in the Brawley vicinity is more likely to occur in areas adjacent to floodplains located along the New River, located approximately 3 miles northwest of the Brawley Campus, and the Alamo River, located approximately 1 mile east of the campus. These rivers flow in a northerly direction through the center of the Imperial Valley toward the Salton Sea (SDSU 2003).

Flood zones identified on FEMA Flood Insurance Rate Maps (FIRMs) are identified as a Special Flood Hazard Area (SFHA). An SFHA is defined as the area that will be inundated by the flood event having a 1% chance of being equaled or exceeded in any given year. The 1%-annual-chance flood is also referred to as the base flood or 100-year flood. “Floodways” are areas within the SFHA that include the channel of a river/watercourse and adjacent land areas, which in an unobstructed condition can discharge a 100-year flood/base flood without any increase in water surface elevations. The Brawley Campus is not located within a SFHA (FEMA 2008). However, most of the flat irrigated valley, with its low-lying canal/drain systems, is subject to minor, shallow flooding and ponding due to the lack of local topographic relief, occasional intense storm events, and low soil infiltration rates that produce rapid runoff flows (SDSU 2003).

Groundwater

The Brawley Campus is located in the Imperial Valley Planning Area of the West Colorado River Basin, in the Imperial Hydrologic Subunit (HSU). Isolated aquifers of good quality groundwater are present in Imperial HSU, but overall groundwater quality is generally poor. Groundwater resources are generally unsuitable for domestic consumption under federal and State drinking water standards. Groundwater is stored in the Pleistocene sediments of the Imperial Valley floor. These fine-grained lake sediments inhibit ground water movement, and tile-drain systems are utilized to dewater the sediments to a depth below the root zone of crops and to prevent the accumulation of saline water on the surface. Few wells have been drilled in these lake sediments because the yield is poor and the water is generally saline. The few wells in the Valley are for domestic use only. Factors that diminish groundwater reserves are consumptive use, evapotranspiration, evaporation from soils where groundwater is near the surface, and losses through outflow and export. In addition, groundwater quality is considered to result from infiltration of agricultural runoff and pre-existing subsurface salt deposits. The RWQCB has designated groundwaters in Imperial HSU for the beneficial uses of municipal and industrial supply (SDSU 2003).

The Imperial County groundwater basins are not adjudicated and are all designated by the California Department of Water Resources as having a very low priority with regard to enacting the Sustainable Groundwater Management Act (SGMA)(California DWR 2020). Low and very low priority basins are not required to prepare Groundwater Sustainability Plans at this time. Groundwater is managed by Imperial County’s Groundwater Ordinance contained in Title 9, Division 22, of the Land Use Ordinance, Section 92201.

The city of Brawley operates a municipal water treatment system that supplies domestic water to approximately 20,000 people. Colorado River water, imported via the All American Canal, is the predominant water supply and is used for irrigation, industrial, and domestic purposes. Potable water and irrigation water are supplied to the city by the IID (SDSU 2003). The Brawley campus site is located outside of the Service Area of the city , but is located within the city Sphere of Influence (City of Brawley 2015). A Memorandum of Understanding (MOU) has been executed to ensure adequate levels of service for the Brawley campus.

5 Impact Analysis and Conclusions

5.1 Thresholds of Significance

The thresholds of significance used to evaluate the impacts of the proposed project related to hydrology and water quality are based on Appendix G of the CEQA Guidelines (Cal. Code Regs., Title 14, Chptr. 3, sections 15000-15387). A significant impact under CEQA would occur if the proposed project would:

a. Violate any water quality standards or waste discharge requirements or otherwise substantially degrade surface or groundwater quality.
b. Substantially decrease groundwater supplies or interfere substantially with groundwater recharge such that the project may impede sustainable groundwater management of the basin.
c. Substantially alter the existing drainage pattern of the site or area, including through the alteration of the course of a stream or river or through the addition of impervious surfaces, in a manner which would:
   i) result in substantial erosion or siltation on- or off-site;
   ii) substantially increase the rate or amount of surface runoff in a manner which would result in flooding on- or offsite;
   iii) create or contribute runoff water which would exceed the capacity of existing or planned stormwater drainage systems or provide substantial additional sources of polluted runoff; or
   iv) impede or redirect flood flows.
d. In flood hazard, tsunami, or seiche zones, risk release of pollutants due to project inundation.
e. Conflict with or obstruct implementation of a water quality control plan or sustainable groundwater management plan.

5.2 Impact Analysis

a) Would the project violate any water quality standards or waste discharge requirements or otherwise substantially degrade surface or groundwater quality?

Impacts relative to this significance criteria and threshold are separately addressed in the contexts of project construction and operation.

Construction

Construction impacts related to water quality were evaluated in Section 3.11, Water Quality, of the 2003 EIR, which concluded that the potential surface water and groundwater quality impacts during construction would be less than significant with implementation of a construction Stormwater Pollution Prevention Program (SWPPP), as required by the Clean Water Act.

The proposed project involves construction and operation of a new campus building generally within the footprint of Building 102, as identified in the approved Campus Master Plan and previously analyzed in the 2003 EIR. Project construction activities, such as grading, excavation, and trenching, would result in disturbance of soils on the project site. Construction site runoff can contain soil particles and sediments from these activities. Dust from construction sites, in addition to spills or leaks from heavy equipment and machinery, staging areas, or building sites can also enter runoff and water bodies. Typical pollutants could include petroleum products and heavy metals from equipment, as well as products such as paints, solvents, and cleaning agents, which could contain hazardous constituents. Sediment from erosion of graded or excavated surface materials, leaks or spills from equipment, or inadvertent releases of construction materials could result in water quality degradation if runoff containing the sediment entered receiving waters in sufficient quantities to exceed water quality objectives. However, contributions of sediment from construction and construction-related pollutants would be minor and not measurable in the context of the watershed as a whole.

The prevailing standard is nevertheless to reduce pollutant contributions to the maximum extent practicable regardless of how minor the sediment contribution might be. Regulations (Phase II Rule) that became final on December 8, 1999, expanded the existing National Pollutant Discharge Elimination System (NPDES) Program to address stormwater discharges from construction sites that disturb land equal to or greater than 1.0 acre. The regulations also require that stormwater discharges from small municipal separate storm sewer systems (MS4s) be regulated by an NPDES General Permit for Storm Water Discharges Associated with Construction Activity (Order No. 2009-0009-DWQ, NPDES No. CAS000002), also known as the Construction General Permit.

The Construction General Permit requires the development and implementation of a SWPPP, which describes best management practices (BMPs) the discharger would use to protect stormwater runoff. The SWPPP would incorporate effective BMPs, including silt fences installed along limits of work and the project construction site, stockpile containment (e.g., Visqueen, fiber rolls, gravel bags), exposed soil stabilization structures (e.g., fiber matrix on slopes and construction access stabilization mechanisms), construction of temporary sedimentation basins, limitations on work periods during storm events, and street sweeping. The SWPPP must contain a visual monitoring program, a chemical monitoring program for non-visible pollutants to be implemented if there is a failure of BMPs, and a sediment-monitoring plan, as the site discharges directly to a water body listed on the 303(d) list for sediment. Routine inspection of all BMPs is required under the provisions of the Construction General Permit. Surface water pollution prevention would prevent seepage of contaminants into the underlying groundwater. A copy of the applicable SWPPP would be kept at the construction site.

Non-stormwater discharges during construction would include periodic application of water for dust control purposes. Because dust control is necessary during windy and dry periods to prevent wind erosion and dust plumes, water would be applied in sufficient quantities to wet the soil but not so excessively as to produce runoff from the construction site. Water applied for dust control would either quickly evaporate or locally infiltrate into shallow surface soils. These stipulations are routine in SWPPPs and other construction contract documents, which typically state that water would only be applied in a manner that does not generate runoff. Therefore, water applied for dust control would not result in appreciable effects on groundwater or surface water features and thus would not cause or contribute to exceedances of water quality objectives contained in the RWQCB Basin Plan.

No new information or substantial changes in circumstances have occurred requiring new or additional analysis with regard to construction-related impacts to water quality at the project site. As such, potential project impacts relating to violation of surface water and groundwater quality standards or waste discharge requirements during construction would be **less than significant**, and no mitigation is required.

Operation

The analysis presented in Section 3.11, Water Quality, of the 2003 EIR, concluded that increases in surface runoff would not have a substantial effect on groundwater or surface water quality. Surface flows of fresh water from the site would be lower in salt (i.e., TDS) concentrations than the Salton Sea; therefore, dilution of Salton Sea water with fresh water would not be a significant impact. In addition, conversion of the project site from agricultural uses to urban uses would reduce the amount of fertilizer and pesticide residues, salts, and selenium infiltrating into soils and groundwater, or discharging to the drainage system. While conversion from agricultural to urban uses would increase surface discharges of total petroleum hydrocarbons and other urban pollutants to local drains and the Alamo River, overall changes in water quality to the Alamo River and Salton Sea would be insignificant because of the relatively small amounts of runoff from the site relative to the volume of agricultural water draining to these water bodies.

While the 2003 EIR did not identify significant impacts, mitigation measures were adopted recommending that 1) SDSU coordinate separate storm drain and sanitary sewers for project facilities so that stormwater runoff will not increase the frequency or volume of wastewater treatment overflows, and 2) a stormwater detention basin be constructed at a capacity equal to the flow level now generated, plus the increase generated by impervious surfaces created during development (See Mitigation Monitoring and Reporting Program (MMRP) page 11-4)[1]. With implementation of the mitigation measures, impacts were determined to be less than significant.

The proposed project building would have an area of 36,900gross sf and hardscape improvements would include 41,297sf of sidewalks and pedestrian walkways, which will connect the project site to the existing campus building and parking lot. The project would also include 61,119sf of on-site landscaping, Increased impervious areas and non-point source pollutants associated with the proposed project could alter the types and levels of pollutants that may be present in project site runoff. Runoff from building rooftops, driveways, and landscaped areas can contain nonpoint source pollutants such as sediment, trash, oil,

[1] **3.11 Water Quality Mitigation Measures** included on page 11-4 of the 2003 EIR: (1) SDSU shall coordinate separate storm drains and sanitary sewers for project facilities so that storm runoff from the project will not increase the frequency or volume of waste water treatment plant overflows. (2) Storm water detention basins, as shown as part of the project design, shall be constructed consistent with engineering standards at a capacity equal to the flow level now generated plus the increase generated by impervious surface created during development.

grease, heavy metals, pesticides, herbicides, and/or fertilizers. Concentrations of pollutants carried in urban runoff are extremely variable, depending on factors such as the volume of runoff reaching the storm drains, time since the last rainfall, and degree to which street cleaning occurs. Without design features to capture and treat stormwater runoff, the increase in the developed area could have adverse water quality impacts on downstream drainages and the Alamo River.

The County of Imperial is enrolled under SWRCB Phase II Small MS4 General Permit 2013-0001 DWQ, which provides permit coverage for non-traditional MS4s, such as public campuses (SWRCB 2023b). In compliance with this permit, the project would include the construction of bio-retention areas to capture stormwater runoff from stormwater drainages systems that will be located throughout the project site. Bio-retention features function as both water quality and flood control features, by filtering out surface water contaminants and slowing stormwater runoff prior to off-site stormwater discharge. In addition, proposed landscaping would further reduce potential adverse water quality impacts by reducing impervious surfaces, which increase runoff, collect pollutants, and contribute to adverse water quality impacts. With construction of proposed bio-retention features and landscaping, water quality impacts would be minimized such that the project would not violate any water quality standards or waste discharge requirements or otherwise substantially degrade surface or groundwater quality. Impacts would be **less than significant**, and no additional mitigation is required.

b) Would the project substantially decrease groundwater supplies or interfere substantially with groundwater recharge such that the project may impede sustainable groundwater management of the basin?

The Initial Study (IS) prepared for the 2003 EIR determined that no impact would occur with regard to decreased groundwater supplies or groundwater recharge. Following project construction, changes in land cover (e.g., increases in impervious surfaces) ultimately could affect the amount of stormwater that percolates into the ground versus the amount that runs off into downstream drainages and the Alamo River. However, the Brawley campus is surrounded by pervious agricultural areas that facilitate percolation and, as such, construction of the proposed building and associated sidewalks and pedestrian walkways would have a nominal effect on groundwater recharge. In addition, the project would include bio-retention basins that will be located throughout the project site, and 61,119sf of on-site landscaping. These pervious areas will slow runoff and enhance groundwater recharge.

As to any potential impacts related to the direct drawing of groundwater supplies, potable water is provided to the campus via a MOU with the city of Brawley. Colorado River water, imported via the All American Canal, is the predominant water supply for the project area and is used for irrigation, industrial, and domestic purposes. Thus, the project would not substantially decrease groundwater supplies such that the project would impede sustainable groundwater management of a groundwater basin.

As such, direct impacts of the proposed project on aquifer volumes and the local groundwater table would be negligible. The project would not substantially interfere with groundwater recharge such that the project may impede sustainable groundwater management of the underlying groundwater basin. Impacts would be **less than significant.**

c) ***Would the project substantially alter the existing drainage pattern of the site or area, including through the alteration of the course of a stream or river or through the addition of impervious surfaces, in a manner which would:***

- i) ***result in substantial erosion or siltation on- or off-site;***
- ii) ***substantially increase the rate or amount of surface runoff in a manner which would result in flooding on- or offsite; or***
- iii) ***create or contribute runoff water which would exceed the capacity of existing or planned stormwater drainage systems or provide substantial additional sources of polluted runoff?***

Impacts related to changes in drainage patterns and potential increased runoff were evaluated in Section 3.8, Hydrology/Flood Control, of the 2003 EIR, which concluded that undergrounding portions of the drainage system could result in upstream backups or increased flooding due to more restrictive conditions. However, undergrounding portions of the drainage system could incrementally improve water quality in the drains by limiting exposure to surface contaminants. In order to provide stormwater runoff protection for downstream properties, drainage improvements were required in order to retain projected 100-year event storm runoff and release it at existing rates, as allowed by IID. Mitigation measures were adopted recommending that 1) the drainage patterns be coordinated with the City to ensure that new drainage patterns do not adversely affect the City drainage system, 2) a site-specific drainage study and detention basin design shall be conducted, 3) SDSU coordinate with IID to ensure relocation and undergrounding plans for canals and drains are designed to maintain existing flow rates and structure capacity, and 4) any temporary relocation of private or IID canals and drainage ditches are coordinated with the affected agencies (See MMRP page 11-4)[2]. With implementation of these mitigation measures, impacts were determined to be less than significant.

The proposed project would involve the construction of additional improvements that would increase the impervious surface area; these include the proposed building, sidewalks and pedestrian walkways, and landscaping. Although the footprint of pervious and impervious areas would change in comparison to existing conditions, drainage from the site would occur at the same outfall locations as those that currently exist. The topography of the site is relatively flat to gently sloping and would not change appreciably as a result of project construction or operation. As a result, impacts relating to alteration of the existing drainage pattern of the site would not be significant.

As discussed for Threshold b, although the amount of impervious surfaces would increase following project construction, the project would include bio-retention basins that will be located throughout the project site, as well as 61,119sf of on-site landscaping. These pervious areas will slow runoff such that the project would not substantially increase the rate or amount of surface runoff and result in flooding on- or off-site, or result in substantial erosion or siltation on- or off-site. Similarly, inclusion of the bio-retention features and landscaping would reduce runoff such that the project would not create or contribute runoff water

[2] **3.8 Hydrology/Flood Control Mitigation Measures** included on page 11-4 of the 2003 EIR: (1) The drainage patterns will be coordinated with the City of Brawley to ensure that new drainage patterns from the campus will not adversely affect the City drainage system. A site specific drainage study and detention basin design shall be conducted by a registered hydraulic engineer and provided to the City and IID, which will be consistent with engineering standards. (2) SDSU will coordinate with IID to ensure relocation and undergrounding plans for canals and drains are designed to maintain existing flow rates and structure capacity. (3) Any temporary relocation of private or IID canals and drainage ditches shall be coordinated with the affected agencies.

which would exceed the capacity of existing or planned stormwater drainage systems, or provide substantial additional sources of polluted runoff. For these reasons, impacts would be **less than significant,** and no additional mitigation is required.

iv) impede or redirect flood flows?

The IS prepared for the 2003 EIR determined that no impact would occur with regard to 100-year flood hazard areas.

As discussed in Section 4.1, Existing Conditions, the Brawley Campus is not located within a SFHA. Therefore, construction of the proposed campus building would not impede or redirect flood flows. **No impacts** would occur.

d) In flood hazard, tsunami, or seiche zones, would the project risk release of pollutants due to project inundation?

The IS prepared for the 2003 EIR determined that no impact would occur with regard to flooding, including flooding as a result of failure of a levee or dam, or inundation by seiche, tsunami, or mudflow.

As discussed for Threshold c-iv, the Brawley Campus is not located within a SFHA. The project site is not located in proximity to the Pacific Ocean and would therefore not be susceptible to tsunamis. A seiche is oscillations in an enclosed body of water, such as a lake or reservoir, typically as a result of seismically induced ground shaking. No such bodies of water are located adjacent to the Brawley Campus; therefore, the proposed building would not be susceptible to seiches. Since adoption of the 2003 EIR, the CEQA significance criteria have been revised (per Appendix G of the 2023 CEQA Statute and Guidelines) and impacts related to failure of a levee or dam, or inundation by mudflow, are no longer evaluated under CEQA. Therefore, flooding related to levees, dams, and mudflows have not been evaluated in this memo. As a result, the project would not risk release of pollutants due to project inundation. **No impacts** would occur.

e) Would the project conflict with or obstruct implementation of a water quality control plan or sustainable groundwater management plan?

The 2003 EIR and IS prepared for the 2003 EIR did not specifically address conflict with or obstruction of implementation of a water quality control plan or sustainable groundwater management plan. Therefore, a discussion regarding this issue is provided below. Impacts related to construction and operation of the proposed project are addressed separately.

Construction

As previously noted, the proposed project would be required to comply with the Construction General Permit requiring preparation and implementation of a SWPPP to control runoff from construction work sites. The SWPPP must include BMPs to address transport of sediment and protect properties from erosion, flooding, or the deposition of mud, debris, or construction-related pollutants. Implementation of BMPs, including physical barriers to prevent erosion and sedimentation, construction of sedimentation basins, limitations on work periods during storm events, use of infiltration swales, protection of stockpiled materials, and a variety of other measures, would substantially reduce the potential for impacts to surface water quality occurring during construction. Therefore, the project would not conflict with or obstruct implementation of a water quality control plan or sustainable groundwater management plan and impacts from construction would be **less than significant**.

Operations

The proposed project would be subject to the requirements of the Water Quality Control Plan for the Colorado River Basin (i.e., Basin Plan), which outlines water quality objectives for all surface water resources within the basin, including the nearby Alamo River. Compliance with the Basin Plan is ensured through waste discharge requirements for all surface water discharges, including stormwater. Imperial County, as a Permittee under the SWRCB Phase II Small MS4 General Permit (2013-0001 DWQ), is required to implement stormwater BMPs that comply with water quality objectives, including capturing and treating stormwater runoff. The project would include construction of numerous biofiltration features and landscaping, which would ensure that the project is consistent with the Basin Plan's water quality objectives.

Further, groundwater would not be used as a water source for the project. Water would be supplied from the Colorado River via the All American Canal. Therefore, the Project would not conflict with or obstruct implementation of the Basin Plan or a Groundwater Sustainability Plan (under SGMA). As a result, impacts would be **less than significant.**

6 References

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Appendix I
Noise Technical Memorandum

MEMORANDUM

To:	Michael Haberkorn, Gatzke Dillon & Ballance
From:	Cole Martin, INCE & Mark Storm, INCE Bd. Cert.
Subject:	SDSU Imperial Valley – Brawley, Brawley Sciences Building Project- Noise Technical Memorandum
Date:	August 16, 2023
cc:	Kirsten Burrowes, Sarah Lozano, Dudek
Attachments:	A – Figures B – Construction Noise Prediction Model Worksheets

Dudek has conducted an evaluation pursuant to the requirements of the California Environmental Quality Act (CEQA), California Public Resources Code 21000, et seq., to determine the presence of and potential impacts related to noise associated with the proposed San Diego State University (SDSU) Imperial Valley – Brawley, Brawley Sciences Building Project (project or proposed project), located east of Brawley, California. This technical memorandum provides the results of the noise assessment.

1 Project Location and Setting

The project is located at 560 California State Route (SR) 78 (also referred to as Ben Hulse Highway) in Imperial County, east of the City of Brawley (see Attachment A: Figure 1). Regional access to the campus is provided by SR 111 and SR 86 to the west and northwest, respectively, and SR 115 to the east. The proposed project site is surrounded by agricultural uses to the north, south, and west. Undeveloped land and a solar farm are located directly east of the proposed project site. The proposed building would be constructed northeast of existing campus Building 101, and the associated parking lot. Project construction staging areas would occupy the area of campus located southeast of the site and north of SR 78 (see Attachment A: Figure 2).

2 Project Description

In September 2003, CSU certified an environmental impact report (EIR) and approved a Campus Master Plan for development of Brawley Center (Brawley campus or center), which would serve as an extension of the existing SDSU Imperial Valley Campus (IVC) located in Imperial County. The IVC is an extension of SDSU's main campus located in San Diego and furthers the university's regional educational mission to provide additional educational opportunities to the outlying communities of Imperial County. The approved Campus Master Plan and certified environmental impact report (EIR) provided the sufficient environmental analysis and authorization necessary for enrollment of 850 full-time equivalent (FTE) students and corresponding faculty and staff and provided a framework for development of the facilities necessary to serve the approved campus enrollment.

The Brawley campus is approximately 200 acres in size and is located east of the city of Brawley (City). See Attachment A: Figure 1. Currently, the campus has been partially built out with educational and support facilities, although much of the campus remains undeveloped or used for active agriculture. As noted above, the environmental impacts associated with development of the Brawley campus, including a student enrollment up to

850 FTE, were evaluated at a program level of review in the previously certified 2003 SDSU Imperial Valley Campus Master Plan Project EIR (2003 EIR) (SCH 200251010). In CSU's effort to build out the IVC consistent with the previously approved Campus Master Plan, SDSU now proposes construction and operation of a sciences building that would be located on the Brawley campus.

The proposed project involves the construction and operation of a sciences building that would house teaching labs, lecture spaces, faculty/administration offices, research spaces, and conference rooms, as well as mechanical, electrical, and telecom support spaces. The proposed project does not include/propose any increase in the previously authorized and approved maximum student enrollment of 850 FTE.

The proposed project site is approximately 3.2-acres in size and the construction staging areas would occupy approximately 1-acre in the area of campus located southeast of the site and north of California State Route (SR) 78. The project includes 61,119 sf of on-site landscaping, including the construction of bio-retention areas to capture stormwater runoff from stormwater drainages systems that will be located throughout the project site. Hardscape improvements will include 41,297 sf of sidewalks and pedestrian walkways, which will connect the project site to existing campus buildings and parking lot.

Additionally, the project would require new points of connection to domestic water, fire water, and sewer lines from existing utility lines to serve the new building, as well as new domestic water line infrastructure. Potable water will be provided by the City of Brawley, as well as sewer and wastewater collection services. New utility infrastructure will also be required to support electrical services for the building, as well as a back-up diesel operated generator.

The proposed project building would have an area of 36,900 gross sf and would be approximately 35 feet in height. The project is expected to be built over the course of 19 months, with construction estimated to begin in 2024. Construction and equipment staging would require 1-acre of space within the campus, directly east of existing Building 101 and the parking lot. The project would involve site preparation, grading, and excavation associated with project construction. Excavation depths are anticipated to be 2-5 feet. Waste (i.e., excavated gravel/soil) generated during project construction would be balanced within the site.

3 Analysis Methodology

The analysis presented here considers the potential environmental impacts of the proposed project relative to existing conditions. Establishment of the project site's existing noise conditions and assessment of project-attributed environmental noise impacts has been prepared using information contained in the previously certified 2003 SDSU Imperial Valley Campus Master Plan Project EIR (SDSU 2003), with the information updated, as applicable, with the following contemporary data sources and techniques:

- Federal Transit Administration guidance (FTA 2018) to estimate outdoor ambient sound levels in the project vicinity; and
- Federal Highway Administration (FHWA) Roadway Construction Noise Model (RCNM) reference maximum sound levels (L_{max} at 50 feet distance) and acoustical usage factors (AUF).

4 Noise

4.1 Acoustical Fundamentals

4.1.1 Sound

Noise is defined as unwanted sound. Sound may be described in terms of level or amplitude (measured in decibels [dB]), frequency or pitch (measured in hertz or cycles per second), and duration (measured in seconds or minutes). The standard unit of measurement of the amplitude of sound is the decibel. Because the human ear is not equally sensitive to sound at all frequencies, a special frequency-dependent rating scale is used to relate noise to human sensitivity. The dBA scale performs this compensation by discriminating against low and very high frequencies in a manner approximating the sensitivity of the human ear. Several descriptors of noise (noise metrics) exist to help predict average community reactions to the adverse effects of environmental noise, including traffic-generated noise, on a community. These descriptors include the equivalent noise level over a given period (L_{eq}), the statistical sound level, the day–night average noise level (L_{dn}), and the Community Noise Equivalent Level (CNEL). Each of these descriptors uses units of dBA. Table 1, Typical Exterior and Interior Sound Levels in the Environment, provides examples of A-weighted noise levels from common sounds. In general, human sound perception is such that a change in sound level of 3 dBA is barely noticeable, a change of 5 dBA is clearly noticeable, and a change of 10 dBA is perceived as either doubling or halving the sound level depending on whether the sound is increasing or decreasing.

Table 1. Typical Exterior and Interior Sound Levels in the Environment

Common Outdoor Activities	Noise Level (dBA)	Common Indoor Activities
—	110	Rock band
Jet flyover at 300 meters (1,000 feet)	100	—
Gas lawn mower at 1 meter (3 feet)	90	—
Diesel truck at 15 meters (50 feet), at 80 kilometers per hour (50 mph)	80	Food blender at 1 meter (3 feet) Garbage disposal at 1 meter (3 feet)
Noisy urban area, daytime gas lawn mower at 30 meters (100 feet)	70	Vacuum cleaner at 3 meters (10 feet)
Commercial area Heavy traffic at 90 meters (300 feet)	60	Normal speech at 1 meter (3 feet)
Quiet urban daytime	50	Large business office Dishwasher, next room
Quiet urban nighttime	40	Theater, large conference room (background)
Quiet suburban nighttime	30	Library
Quiet rural nighttime	20	Bedroom at night, concert hall (background)
—	10	Broadcast/recording studio
Lowest threshold of human hearing	0	Lowest threshold of human hearing

Source: Caltrans 2020.
Note: dBA = A-weighted decibel.

The L_{eq} value is a sound level energy-averaged over a specified period (typically no less than 15 minutes for environmental studies). It is a single numerical value that, if constant over time, represents the same amount of variable sound energy received by a receptor during a time interval. For example, a 1-hour L_{eq} measurement would represent the average amount of energy contained in all the noise that occurred in that hour. L_{eq} is an effective noise descriptor because of its ability to assess the total time-varying effects of noise on sensitive receptors.

Unlike the L_{eq} metric, L_{dn} and CNEL descriptors always represent 24-hour periods, often on an annualized basis. L_{dn} and CNEL also differ from L_{eq} because they apply a time-weighted dB adjustment designed to emphasize noise events that occur during the evening and nighttime hours (when speech and sleep disturbance is of more concern). "Time weighted" refers to the fact that L_{dn} and CNEL penalize noise that occurs during certain sensitive periods. In the case of CNEL, noise occurring during the daytime (7:00 a.m.–7:00 p.m.) receives no penalty. Noise during the evening (7:00 p.m.–10:00 p.m.) is penalized by adding 5 dB, while nighttime (10:00 p.m.–7:00 a.m.) noise is penalized by adding 10 dB. L_{dn} differs from CNEL in that the daytime period is defined as 7:00 a.m.–10:00 p.m., thus eliminating the evening period. L_{dn} and CNEL are the predominant criteria used to measure roadway noise affecting residential receptors. These two metrics generally differ from one another by no more than 0.5 dB to 1 dB and, as such, are often treated as equivalent to one another.

4.1.2 Sensitive Receptors

Noise-sensitive land uses are locations where people reside or where the presence of unwanted sound could adversely affect the use of the land. Consistent with types discussed in the 2003 EIR, residences, schools, hospitals, guest lodging, libraries, and some passive recreation areas would be considered noise sensitive and may warrant unique measures for protection from intruding noise. Sensitive receptors in the vicinity of the project site consist of a residential use located to the west. This sensitive receptor represents the nearest sensitive land use with the potential to be impacted by construction and/or operation of the project.

4.2 Existing Noise Conditions

The FTA has offered guidance on estimating existing outdoor ambient sound levels due to proximity to roadways and rail, or based on an approximation formula with population density as the input parameter (FTA 2018). By way of example, the former of these techniques predicts that daytime L_{eq} can be 55 dBA at a distance of 800 feet to an Interstate highway, and 75 dBA at a distance of only 50 feet. Similar estimates are offered by the FTA with respect to receptor proximity to operating railroads, parkways, and arterial roads. Previously conducted outdoor ambient sound level surveys for other cities in California, exhibited in a variety of published project studies that are publicly available, show daytime L_{eq} values that are generally consistent with these estimates but also account for other acoustical contributors to the measured environment at a specific surveyed location.

Utilizing a combination of data from the aforementioned FTA guidance, the following Table 2, Estimated Outdoor Ambient Sound Level (dBA, CNEL) per FTA Guidance, provides a matrix from which the pre-existing outdoor ambient sound level, expressed as day-night sound levels (L_{dn}, which for purposes of this assessment, are considered equivalent to CNEL values) can be estimated.

Table 2. Estimated Outdoor Ambient Sound Level (dBA, CNEL) per FTA Guidance

Population Density (people per square mile) in Vicinity of Project Implemented under Program	300–1,000	1,000–3,000	3,000–10,000	10,000–30,000
Distance to Interstate Highway 1,2 = 10–50 feet	75	75	75	75
50–100 feet	70	70	70	70
100–200 feet	65	65	65	65
200–400 feet	60	60	60	60
400–800 feet	55	55	55	60
800 or more feet	50	50	55	60
Parkway (55 mph) or City Streets (30 mph) 1,3 = 10–50 feet	70	70	70	70
50–100 feet	65	65	65	65
100–200 feet	60	60	60	60
200–400 feet	55	55	55	60
400 or more feet	50	50	55	60
Railway 1,4 = 10–30 feet	75	75	75	75
30–60 feet	70	70	70	70
60–120 feet	65	65	65	65
120–240 feet	60	60	60	60
240–500 feet	55	55	55	60
500–800 feet	50	50	55	60
800 or more	45	50	55	60

Notes:
1 Distances are perpendicular to transportation route centerline and do not include shielding from intervening rows of buildings.
2 Roadways with 4 or more lanes that permit trucks, with traffic at 60 mph.
3 Parkways with traffic at 55 mph, but without trucks, and city streets with the equivalent of 75 or more heavy trucks per hour and 300 or more medium trucks per hour at 30 mph.
4 Main line railroad corridors typically carrying 5-10 trains per day at speeds of 30-40 mph.
Source: FTA 2018

By way of example, online aerial photographs indicate that the population density surrounding the project is likely to be less than 300 people per square mile due to the rural nature of the project area, which FTA guidance would suggest results in a relatively quiet outdoor ambient sound level (45 dBA CNEL) when highways, parkways, and rail transportation routes are very far away. But since the project area is approximately 200-400 feet from Highway 78, FTA guidance then suggests that the estimated outdoor ambient sound level would be at least 55 dBA CNEL. FTA guidance also suggests that published airport noise contours should be consulted, which may show outdoor ambient sound in a project near an airport or airfield is actually much higher than what the values in Table 2 suggest.

Estimates of outdoor ambient sound levels at the project site are consistent with the sound level survey described in Appendix F of the 2003 EIR, which states that 59.7 dBA L_{eq} was sampled over an hour at a distance of 100 feet from the SR 78 centerline. This 2003 EIR baseline sound level is consistent with the 60 dBA magnitude appearing in Table 2 for the “Other Roadway” type and a distance of 100 feet.

4.3 Regulatory Setting

Because SDSU is part of the California State University system, which is a state agency, the proposed project is not subject to local government planning and land use plans, policies, or regulations. Furthermore, as described in Section 2, Project Description, the environmental impacts associated with development of the Brawley Campus Master Plan, including impacts attributable to noise, were previously evaluated at a program level of review in the certified 2003 EIR, and the proposed project (operation of a Lithium Research Hub/STEM research and instruction facility) would be implemented under the approved program. As such, noise impacts related to development of the overall Campus Master Plan, such as those impacts attributable to the increased vehicle traffic generated by 850 FTE students, were previously analyzed and no further analysis of vehicle traffic noise under CEQA is required. Accordingly, the following subsections, which summarize relevant laws, ordinances, regulations, policies, standards, and other guidance that typically would be considered by other development projects in Imperial County, is provided for informational purposes and background context only.

4.3.1 Federal

There are no federal noise standards that would directly regulate environmental noise during construction and operation of the project. The following is provided because guidance summarized herein is provided for informative context with respect to typical noise level thresholds for environmental impact assessment.

Federal Transit Administration

In its Transit Noise and Vibration Impact Assessment guidance manual, the FTA recommends a daytime construction noise level threshold of 80 dBA L_{eq} over an 8-hour period (FTA 2018) when “detailed” construction noise assessments are performed to evaluate potential impacts to community residences surrounding a project. Although this FTA guidance is not a regulation, it can serve as a quantified standard in the absence of such limits at the state and local jurisdictional levels.

4.3.2 State of California

California Government Code Section 65302(f) mandates that the legislative body of each county and city adopt a noise element as part of its comprehensive general plan. The local noise element must recognize the land use compatibility guidelines established by the State Department of Health Services. The guidelines rank noise land use compatibility in terms of “normally acceptable”, “conditionally acceptable”, “normally unacceptable”, and “clearly unacceptable” noise levels for various land use types. Single-family homes are “normally acceptable” in exterior noise environments up to 60 dBA CNEL and “conditionally acceptable” up to 70 dBA CNEL. Multiple-family residential uses are “normally acceptable” up to dBA 65 CNEL and “conditionally acceptable” up to dBA 70 CNEL. Schools, libraries, and churches are “normally acceptable” up to 70 dBA CNEL, as are office buildings and business, commercial, and professional uses.

4.3.3 Imperial County

The following information is provided for information and background purposes only as CSU/SDSU, as a state agency, is not subject to local planning laws and regulations.

As summarized in Section IV.C.1 of its General Plan Noise Element, Imperial County utilizes an interior background sound level standard of 45 dBA CNEL (due to intrusion of exterior noise sources) for inhabited spaces and 50 dBA hourly L_{eq} for schools, libraries and other non-residential facilities with only daytime occupancy.

Consistent with state land use planning guidelines, Imperial County also has its own matrix of noise levels considered compatible for the exteriors of various land uses. Section IV.C.2 of the Noise Element summarizes property line noise limits, expressed as hourly L_{eq} values, that vary with the time of day (i.e., 7 a.m. to 10 p.m. for daytime, and 10 p.m. to 7 a.m. for nighttime, during which time thresholds are more stringent by 5 dB).

With respect to construction noise, Section IV.C.3 limits off-site exposures to 75 dBA L_{eq} over an 8-hour period at the nearest sensitive receptor, and prohibits construction equipment operation outside of the 7 a.m. to 7 p.m. period on weekdays and outside of 9 a.m. to 5 p.m. on Saturdays. Commercial construction activities are prohibited on Sundays and holidays.

Imperial County also has standards relating to the outdoor ambient environment, permissible increases in noise levels that may result due to a noise-generating project:

- If the future noise level after completion of the project causes a 5 dB CNEL increase or greater but within a “normally acceptable” range per the Noise/Land Use Compatibility Guidelines; or
- If the future noise level after completion of the project causes a 3 dB CNEL increase and at a magnitude greater than that of the “normally acceptable” range per the Noise/Land Use Compatibility Guidelines.

5 Impact Analysis and Conclusions

5.1 Thresholds of Significance

The thresholds of significance used to evaluate the impacts of the proposed project related to noise are based on Appendix G of the California Environmental Quality Act (CEQA) Guidelines (Cal. Code Regs., Title 14, Chapter. 3, sections 15000-15387.). A significant impact under CEQA would occur if the proposed project would:

a) Result in generation of a substantial temporary or permanent increase in ambient noise levels in the vicinity of the project in excess of standards established in the local general plan or noise ordinance, or applicable standards of other agencies?
b) Result in generation of excessive groundborne vibration or groundborne noise levels?
c) For a project located within the vicinity of a private airstrip or an airport land use plan or, where such a plan has not been adopted, within two miles of a public airport or public use airport, expose people residing or working in the project area to excessive noise levels?

5.2 Impact Analysis

The Initial Study (IS) prepared for the 2003 EIR determined that there would be “no impact” with respect to generation of noise levels in excess of standards established in the local general plan or noise ordinance or applicable standards of other agencies. The IS similarly concluded no impact due to generation of excessive groundborne vibration or groundborne noise levels; and, no significant impact regarding exposure of people working or residing in the area to excessive aviation noise levels from sufficiently proximate public or private airports or airfields. For these reasons, the 2003 EIR focused on an assessment of potentially significant temporary or permanent increases to outdoor ambient noise levels. A summary of the prior analysis, including significance determinations and mitigation, if applicable, is provided below.

Consistent with the 2003 EIR, the impact assessment herein includes predictive analyses of construction noise (i.e., temporary noise sources) and permanent noise sources, such as HVAC equipment, etc., that would be installed as part of the proposed Project. Durable but localized acoustical additions to the outdoor sound environment on site due to intermittent and continuous sources, such as steady-state operating heating, ventilating, and air-conditioning (HVAC) systems are discussed qualitatively and consistent with the IS finding of no impact to persons on site.

a) Would the project result in generation of a substantial temporary or permanent increase in ambient noise levels in the vicinity of the project in excess of standards established in the local general plan or noise ordinance, or applicable standards of other agencies?

Short-Term Construction Noise

Chapter 3.9, Noise, of the 2003 EIR included an evaluation of potential impacts related to construction noise based on the technical analysis undertaken and presented in EIR Appendix F. Based on the necessarily programmatic analysis, the 2003 EIR determined that no impact would occur with regard to construction noise.

Construction noise is considered a short-term (i.e., temporary) impact. As CSU is not subject to County standards or thresholds, we note for information purposes only that construction-related noise would be considered significant if construction activities exceed the allowable hours of operation as permitted by the County threshold of 75 dBA L_{eq} over an 8-hour period at the nearest sensitive receptor. Such noise-sensitive land uses in the vicinity of the proposed project include a single family-residence to the west (approximately 1,390 feet from the construction boundary). Although additional residences and other noise-sensitive receptors are further afield, the construction noise assessment conducted for the present analysis focused on project-attributed noise exposure levels predicted to occur at these nearest existing residences. Construction noise levels at more distant receptors would be substantially lower, consistent with established acoustical principles of attenuation with geometric divergence and other factors.

Project-generated construction noise will vary depending on the construction process, the type of equipment involved, the location of the construction site with respect to sensitive receptors, the schedule proposed to carry out each task (e.g., hours and days of the week), and the duration of the construction work. Using construction equipment information provided by SDSU, project-level construction noise was calculated using a spreadsheet-based model emulating the Federal Highway Administration (FHWA) Roadway Construction Noise Model (FHWA 2008). Table 3, Construction Scenario Assumptions, presents the equipment list used for the construction noise analysis.

Table 3. Construction Scenario Assumptions (default 5 days per week)

Phase	Equipment Type	Quantity	Usage Hours
Site Preparation	Graders	1	8
	Rubber Tired Dozers	1	7
	Tractors/Loaders/Backhoes	1	8
Grading	Graders	1	8
	Rubber Tired Dozers	1	8
	Tractors/Loaders/Backhoes	2	7
Building Construction	Cranes	1	6
	Forklifts	1	6
	Generator Sets	1	8
	Tractors/Loaders/Backhoes	1	6
	Welders	3	8
Architectural Coating	Air Compressors	1	6

Using the information presented above, construction noise for the proposed project was predicted at a distance of 300 feet (i.e., the same distance used for the prediction of construction noise in the 2003 EIR), as well as 1,390 feet (for the nearest noise-sensitive receptor). Attachment B displays the construction noise model worksheet for the analysis.

As shown in Attachment B, Construction Noise Prediction Model Worksheets, and as a consequence of using construction equipment reference noise data that was available after the 2003 EIR was certified, the predicted aggregate construction noise level at a distance of 300 feet from the project site is expected to be 70 dBA L_{eq} over an 8-hour period for the noisiest phase (Grading) and is one dB higher than the 68.8 dBA 8-hour L_{eq} estimated in the 2003 EIR. Although the 2003 EIR did not identify a particular quantified dB limit against which to assess construction noise impact, this predicted exposure level during daytime hours is below Imperial County's criterion of 75 dBA 8-hour L_{eq} or the FTA guidance-based 8-hour L_{eq} threshold of 80 dBA. At the exterior of the nearest apparent noise-sensitive receptor (1,390 feet from the project), the predicted construction noise level is 57 dBA L_{eq} during the Grading phase and would not only be much quieter than these standards, but very likely comparable to or less than existing outdoor ambient noise levels as may be estimated by the matrix in Table 2. For these reasons, and consistent with the 2003 EIR conclusions, potential impacts associated with project-generated construction noise would be **less than significant.**

Long-Term Operational Noise

Chapter 3.9, Noise, of the 2003 EIR, and the noise study prepared for the EIR, determined that buildout of the Campus Master Plan, including the vehicle trips that would be generated by the approved 850 FTE students, would not result in potentially significant impacts related to traffic roadway noise. The analysis determined that vehicle trips generated by the Campus Master Plan would result in a roadway noise increase over existing conditions of approximately 2.0 dBA, which is below the accepted level of human detectability, and the resulting noise levels would not exceed the applicable significance criteria.

Project-Generated Off-Site Traffic Noise

As noted, the 2003 EIR determined that buildout of the entire Campus Master Plan, including the vehicle trips that would be generated by 850 enrolled FTE students, would not result in significant impacts related to roadway traffic noise. Because roadway noise generated by student enrollment vehicle trips is the primary source of roadway noise, and because the proposed Project does not seek to increase, nor would it increase, enrollment beyond the previously approved FTE, no further analysis of potential impacts related to vehicle roadway noise is necessary under CEQA. Moreover, because the proposed project would implement only a portion of the development planned under the approved Campus Master Plan, the project is expected to generate a number less than 2,000 daily trips to the roadway system, which is the average daily traffic (ADT) volume expected for the entire 850 FTE students. Therefore, based on the lower anticipated level of traffic that would be generated by the proposed project, as compared to that of the entire Brawley Campus Master Plan, impacts would also be expected to be **less than significant.**

Project-Generated Operations Noise

The proposed project is consistent with the development of new classroom and administrative buildings described in the 2003 EIR for the future Brawley campus. As a new building, with added available on-site parking that incorporates modern construction techniques and materials, anticipated heating, ventilating and air-conditioning (HVAC) equipment, the project would be sized and constructed in a manner comparable with similar CSU structures and compatible with other buildings in the Brawley area with respect to climate conditions. Electro-mechanical equipment such as HVAC systems tend to operate continuously and from fixed locations that are typically shielded from direct view by building rooftop parapets or similar solid screens or enclosures—for both visual and security reasons. Hence, and due to the location of the proposed project on the Brawley campus, noise emissions from these stationary sources of steady-state noise would attenuate with distance, intervening structures, acoustical air absorption, and acoustical ground absorption until reaching the nearest noise-sensitive receptor at which the exposure level would be far below Imperial County property line standards or the existing outdoor ambient level and thus a **less than significant** impact.

The proposed project would also emit modest levels of noise due to on-site low-speed (or idling) passenger vehicle traffic associated with full and part-time students, CSU staff and service contractors, and visitors (e.g., deliveries). At such low speeds, engine exhaust noise levels are far less than those emitted by roadway traffic and would thus contribute only low levels of added noise to the outdoor ambient sound environment. For this reason, such on-site traffic noise would be considered a **less than significant** noise impact.

Conclusion

As described above, the proposed project would be consistent with buildout of the Brawley Campus Master Plan that was contemplated in 2003 EIR. As a result, impacts related to generation of a substantial temporary or permanent increase in ambient noise levels during project construction and operation would be **less than significant.**

b) Result in generation of excessive groundborne vibration or groundborne noise levels.

The IS prepared for the 2003 EIR determined that there would be no impact with respect to generation of groundborne vibration or groundborne noise levels. Consistent with this finding, due to source-to-receiver distances expected between construction activities undertaken in connection with the proposed project and the nearest potential off-site vibration-sensitive receptors, which are of sufficient distance to attenuate groundborne vibration to less than perceptible levels, impacts would be considered **less than significant**.

c) For a project located within the vicinity of a private airstrip or an airport land use plan or, where such a plan has not been adopted, within two miles of a public airport or public use airport, expose people residing or working in the project area to excessive noise levels.

The IS prepared for the 2003 EIR determined that there would be no impact with respect to people on campus exposed to excessive aviation noise from nearby public and private airports and airfields. According to Figure 4-C (Noise Impact Area) of the local Airport Land Use Compatibility Plan (ALUCP) pertaining to Brawley Municipal Airport (Imperial County Airports 1996), the Brawley campus is located east of the 65 dBA CNEL aviation noise contour and, thus, impacts would be considered **less than significant.**

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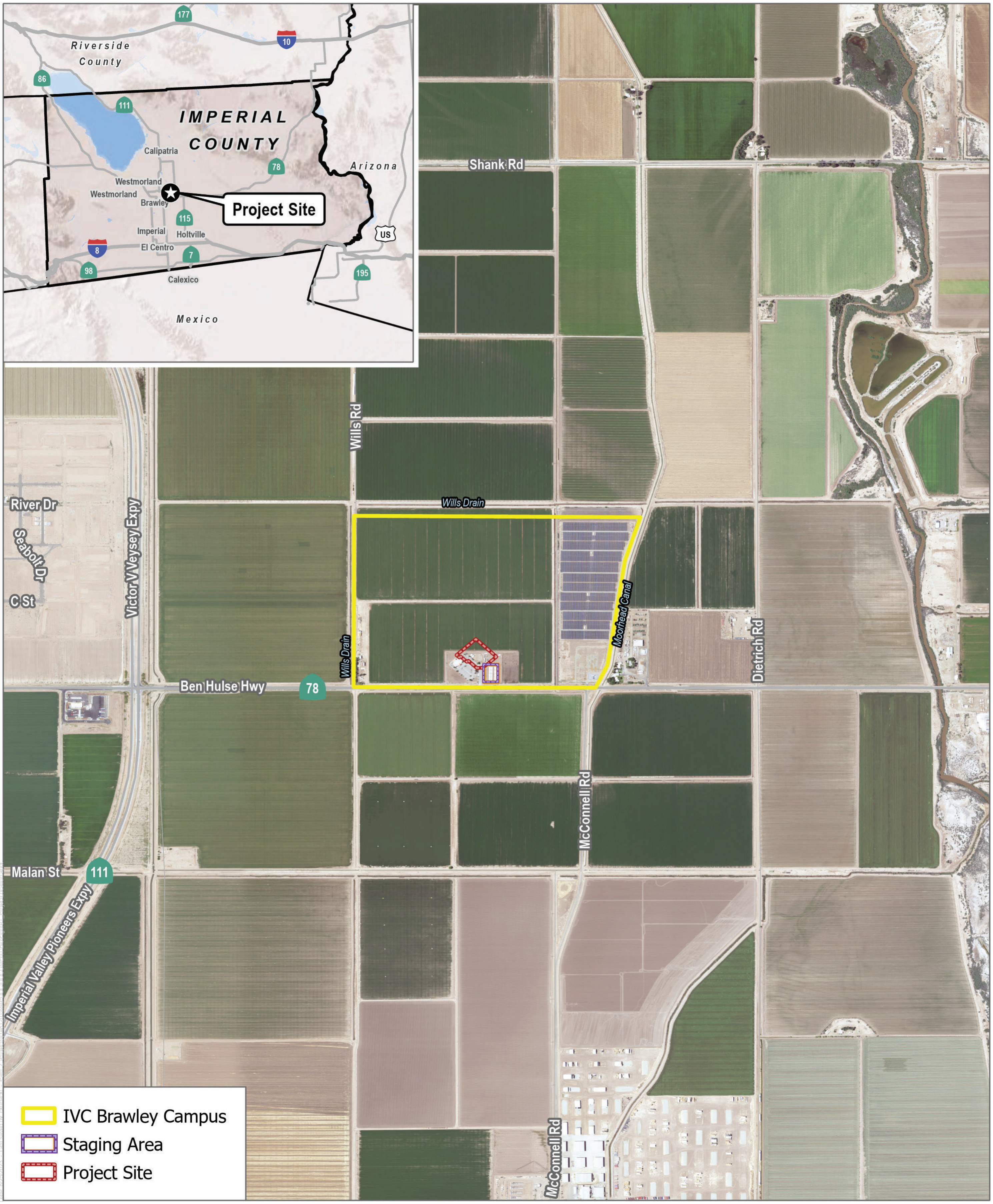
Attachment A

Figures



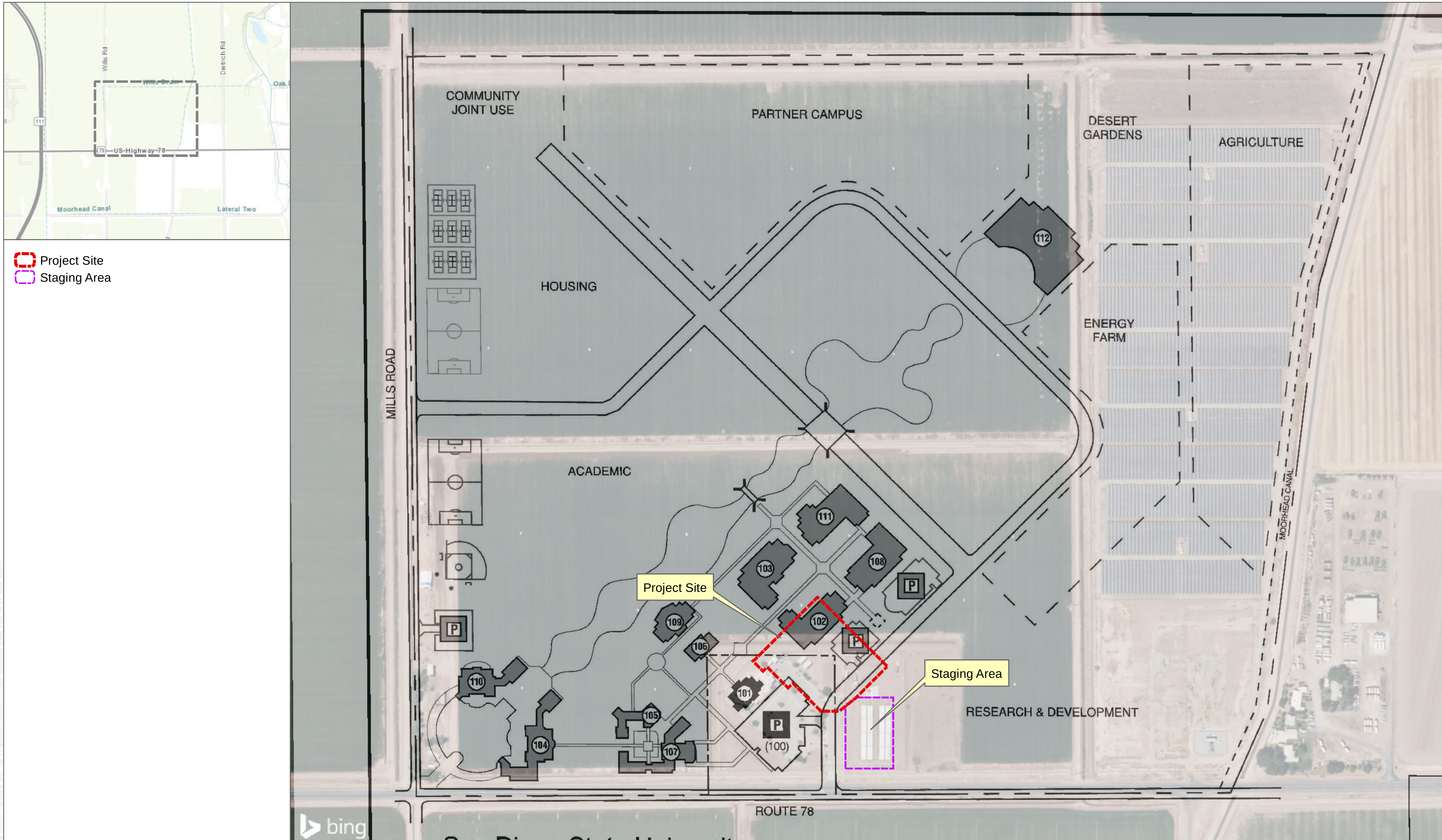
SOURCE: NAIP 2020, Open Streets Map 2019

DUDEK

FIGURE 1

Regional/Campus Location

SDSU Brawley Sciences Building Project



SOURCE: AERIAL-BING MAPPING SERVICE 2022; CAMPUS MASTER PLAN 2003

DUDEK

0 175 350 Feet

FIGURE 2

SDSU Brawley Project Site and Staging Area

SDSU Brawley Sciences Building Project

Attachment B
Construction Noise Prediction Model Worksheets

To User: bordered cells are inputs, unbordered cells have formulae

noise level limit for construction phase at residential land use, per County guidance = 75

allowable hours over which Leq is to be averaged = 8

= temporary barrier (TB) of input height inserted between source and receptor

Construction Activity	Equipment	Total Equipment Qty	AUF % (from FHWA RCNM)	Reference Lmax @ 50 ft. from FHWA RCNM	Client Equipment Description, Data Source and/or Notes	Source to NSR Distance (ft.)	*Temporary Barrier Insertion Loss (dB)*	*Additional Noise Reduction*	Distance-Adjusted Lmax	Allowable Operation Time (hours)	Allowable Operation Time (minutes)	Predicted 8-hour Leq
All Phases	Man Lift	2	20	75	Fork Lift - 175 HP	300	0.1		54.9	4	240	48
	Dump Truck	9	40	76	Off-Highway Trucks	300	0.1		55.9	4	240	59
	Front End Loader	1	40	79	Tracked Loaders	300	0.1		58.9	4	240	52
	Tractor	2	40	84	Tracked Tractor/Dozer	300	0.1		63.9	4	240	60
	Scraper	1	40	84	Scraper	300	0.1		63.9	4	240	57
	Roller	1	20	80	Roller	300	0.1		59.9	4	240	50
	Grader	1	40	85	Grader/Paver	300	0.1		64.9	4	240	58
									Total for All Phases Phase:			**65.0**

Equipment	Source Elevation (ft)	Receiver Elevation (ft)	Barrier Height (ft)	Source to Barr. ("A") Horiz. (ft)	Rcvr. to Barr. ("B") Horiz. (ft)	Source to Rcvr. ("C") Horiz. (ft)	"A" (ft)	"B" (ft)	"C" (ft)	Path Length Diff. "P" (ft)	Abarr (dB)	Heff (with barrier)	Heff (wout barrier)	G (with barrier)	G (without barrier)	ILbarr (dB)
Man Lift	5	5	0	295	5	300	295.0	7.1	300.0	0.00	0.1	5.0	5.0	0.7	0.7	0.1
Dump Truck	5	5	0	295	5	300	295.0	7.1	300.0	0.00	0.1	5.0	5.0	0.7	0.7	0.1
Front End Loader	5	5	0	295	5	300	295.0	7.1	300.0	0.00	0.1	5.0	5.0	0.7	0.7	0.1
Tractor	5	5	0	295	5	300	295.0	7.1	300.0	0.00	0.1	5.0	5.0	0.7	0.7	0.1
Scraper	5	5	0	295	5	300	295.0	7.1	300.0	0.00	0.1	5.0	5.0	0.7	0.7	0.1
Roller	5	5	0	295	5	300	295.0	7.1	300.0	0.00	0.1	5.0	5.0	0.7	0.7	0.1
Grader	5	5	0	295	5	300	295.0	7.1	300.0	0.00	0.1	5.0	5.0	0.7	0.7	0.1

To User: bordered cells are inputs, unbordered cells have formulae

noise level limit for construction phase at residential land use, per County guidance = 75

allowable hours over which Leq is to be averaged = 8

= temporary barrier (TB) of input height inserted between source and receptor

Construction Activity	Equipment	Total Equipment Qty	AUF % (from FHWA RCNM)	Reference Lmax @ 50 ft. from FHWA RCNM	Client Equipment Description, Data Source and/or Notes	Source to NSR Distance (ft.)	*Temporary Barrier Insertion Loss (dB)*	*Additional Noise Reduction*	Distance-Adjusted Lmax	Allowable Operation Time (hours)	Allowable Operation Time (minutes)	Predicted 8-hour Leq
All Phases	Man Lift	2	20	75	Fork Lift - 175 HP	1390	0.1		40.0	4	240	33
	Dump Truck	9	40	76	Off-Highway Trucks	1390	0.1		41.0	4	240	44
	Front End Loader	1	40	79	Tracked Loaders	1390	0.1		44.0	4	240	37
	Tractor	2	40	84	Tracked Tractor/Dozer	1390	0.1		49.0	4	240	45
	Scraper	1	40	84	Scraper	1390	0.1		49.0	4	240	42
	Roller	1	20	80	Roller	1390	0.1		45.0	4	240	35
	Grader	1	40	85	Grader/Paver	1390	0.1		50.0	4	240	43
									Total for All Phases Phase:			**50.0**

Equipment	Source Elevation (ft)	Receiver Elevation (ft)	Barrier Height (ft)	Source to Barr. ("A") Horiz. (ft)	Rcvr. to Barr. ("B") Horiz. (ft)	Source to Rcvr. ("C") Horiz. (ft)	"A" (ft)	"B" (ft)	"C" (ft)	Path Length Diff. "P" (ft)	Abarr (dB)	Heff (with barrier)	Heff (wout barrier)	G (with barrier)	G (without barrier)	ILbarr (dB)
Man Lift	5	5	0	1385	5	1390	1385.0	7.1	1390.0	0.00	0.1	5.0	5.0	0.7	0.7	0.1
Dump Truck	5	5	0	1385	5	1390	1385.0	7.1	1390.0	0.00	0.1	5.0	5.0	0.7	0.7	0.1
Front End Loader	5	5	0	1385	5	1390	1385.0	7.1	1390.0	0.00	0.1	5.0	5.0	0.7	0.7	0.1
Tractor	5	5	0	1385	5	1390	1385.0	7.1	1390.0	0.00	0.1	5.0	5.0	0.7	0.7	0.1
Scraper	5	5	0	1385	5	1390	1385.0	7.1	1390.0	0.00	0.1	5.0	5.0	0.7	0.7	0.1
Roller	5	5	0	1385	5	1390	1385.0	7.1	1390.0	0.00	0.1	5.0	5.0	0.7	0.7	0.1
Grader	5	5	0	1385	5	1390	1385.0	7.1	1390.0	0.00	0.1	5.0	5.0	0.7	0.7	0.1

Attachment C

Traffic Noise Modeling Calculations - Summary

Project: 14812 SDSU Brawley STEM Facility

	Segment Description and Location					
Number	Name	From	To	Existing (2020)	Existing (2020) + Project	Δ Existing (2020) – Existing (2020) + Project
Summary of Net Changes						
1	Highway 78	Highway 111	Detrich Road	67.9	69.5	1.6

*All modeling assumes average pavement, level roadways (less than 1.5% grade), constant traffic flow and does not account for shielding of any type or finite roadway adjustments. All levels are reported as A-weighted noise levels.

Attachment C
Traffic Noise Model Calculations

Project: 14812 SDSU Brawley STEM Facility

Noise Level Descriptor: CNEL
Site Conditions: Soft
Traffic Input: ADT
Traffic K-Factor: 10

Segment Description and Location				Input											Output				
						Distance to Directional Centerline, (feet)4		Traffic Distribution Characteristics							CNEL,	Distance to Contour, (feet)3			
Number	Name	From	To	ADT	Speed (mph)	Near	Far	% Auto	% Med	% Hvy	% Day	% Eve	% Night		(dBA)5,6,7	70 dBA	65 dBA	60 dBA	55 dBA
Existing (2020) Conditions																			
1	Highway 78	Highway 111	Detrich Road	4,350	55	90	112	47.0%	30.0%	23.0%	80.0%	5.0%	15.0%		67.9	73	156	337	726

*All modeling assumes average pavement, level roadways (less than 1.5% grade), constant traffic flow and does not account for shielding of any type or finite roadway adjustments. All levels are reported as A-weighted noise levels.

Attachment C

Traffic Noise Model Calculations

Project: 14812 SDSU Brawley STEM Facility

Noise Level Descriptor: CNEL
Site Conditions: Soft
Traffic Input: ADT
Traffic K-Factor: 10

Number	Name	From	To	ADT	Speed (mph)	Distance to Directional Centerline, (feet)4 Near	Far	% Auto	% Med	% Hvy	% Day	% Eve	% Night	CNEL, (dBA)5,6,7	Distance to Contour, (feet)3 70 dBA	65 dBA	60 dBA	55 dBA
Segment Description and Location				Input				Traffic Distribution Characteristics						Output				
Existing (2020) + Project Conditions																		
1	Highway 78	Highway 111	Detrich Road	6,350	55	90	112	47.0%	30.0%	23.0%	80.0%	5.0%	15.0%	69.5	93	201	434	934

*All modeling assumes average pavement, level roadways (less than 1.5% grade), constant traffic flow and does not account for shielding of any type or finite roadway adjustments. All levels are reported as A-weighted noise levels.

Appendix J

SDSU City of Brawley MOU

ADMINISTRATIVE AGREEMENT BETWEEN THE SAN DIEGO STATE UNIVERSITY POLICE DEPARTMENT AND THE IMPERIAL COUNTY SHERIFF'S DEPARTMENT

I. PURPOSE

The purpose of this Memorandum of Understanding (MOU) is to identify procedures for the San Diego State University Police Department and the Imperial County Sheriff's Department to provide response to incidents occurring on San Diego State University properties. The intent of this document is to identify and affix responsibilities for providing efficient police services for the area contiguous to the San Diego State University Brawley campus, as defined by Education Code 67381.

II. AUTHORITY, JURISDICTION AND DUTIES

The San Diego State University Police Department (UPD) will be the primary reporting and investigating law enforcement agency for all Part 1 violent crimes occurring on the San Diego State University Brawley campus, regardless if the victims/suspects are affiliated with San Diego State University. Except for:

> **Any homicide, officer-involved shooting, or use of force incident by any officer that results in death, which occurs on the Brawley campus. In the event any incident specified above should occur, UPD shall contact the Imperial County Sheriff's Department. The Imperial County Sheriff's Department shall assume lead responsibility for the investigation, with assistance provided by UPD.**

Both agencies will continue to provide mutual aid assistance when requested, as appropriate.

III. INVESTIGATIVE RESPONSIBILITIES

The investigating agency shall be responsible for the release of information regarding any media inquiries. A copy of any media press release will be provided to either the San Diego State University Police Department or the Imperial County Sheriff's Department as appropriate.

Further, each agency assumes responsibility for preparing the appropriate reports for the Bureau of Criminal Statistics and the Uniform Crime Report.

IV. LIABILITY

The San Diego State University Police Department and the Imperial County Sheriff's Department acknowledge that this MOU is by and between independent agencies and is not intended to, and shall not be construed to create the relationship of agent, servant, employee, partnership, joint venture, or association. For tort liability purposes, neither participating agency shall be considered the agent of the other. Each participating agency shall, to the extent possible under federal and state law, assume financial responsibility for any liabilities arising from the acts or omissions of its own employees' actions pursuant to this MOU.

V. TERM OF AGREEMENT

This MOU shall be in effect for five (5) years from July 1, 2019. San Diego State University Police Department and Imperial County Sheriff's Department representatives shall meet and confer at least once every five years, or more frequently if deemed necessary, to review the terms of this MOU. If it is determined that modifications are necessary, such modifications shall be made and appropriately executed by authorized representatives from each agency.

Chief Josh Mays San Diego State University Police Department	10/21/19 Date
Raymond Loera Imperial County Sheriff's Department	10-29-19 Date

Appendix K
Transportation Analysis

MEMORANDUM

To:	Michael Haberkorn Gatzke Dillon & Ballance LLP	Date:	5-24-2023
From:	John Boarman, P.E. LLG, Engineers	LLG Ref:	3-22-3658
Subject:	SDSU Brawley STEM Facility, Transportation Analysis		

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The purpose of this technical memorandum is to analyze the potential transportation impacts related to construction and development of the proposed STEM (science, technology, engineering, and mathematics) building to be constructed on the Brawley campus of San Diego State University (SDSU) (Project or proposed Project). The transportation impacts associated with development of the Brawley campus were analyzed previously in the certified 2003 SDSU Imperial Valley Master Plan Project environmental impact report (EIR), SCH No. 200251010. The EIR analyzed the potential transportation-related impacts associated with development of a Campus Master Plan that would serve a student enrollment up to 850 full-time equivalent (FTE) students. The proposed Project does not include/propose an increase in the previously authorized and approved maximum student enrollment of 850 FTE, nor would the proposed Project result in an FTE enrollment above the previously approved 850.[1]

PROJECT DESCRIPTION

The proposed Project consists of the construction of a new standalone building that would house laboratory, lecture, and research space on the SDSU Brawley campus. The new building would be located on a vacant site in the southwest portion of the campus that was designated for development on the approved Brawley Campus Master Plan. Specifically, the STEM building would be located generally on the site of Building 102, as shown on the Campus Master Plan and previously analyzed and approved as part of the 2003 EIR. See ***Figure C***, Proposed Building.

The proposed building would consist of approximately 66,000 gross square feet (“GSF”), with 43,000 assignable square feet (“ASF”). The structure would include lower and upper division teaching labs, interdisciplinary lecture space, 45 faculty/administrative offices, research and research services space, conference rooms, and mechanical/electrical/telecommunication support space. The facility also will include 20,000 ASF of labs, core facilities with major instruments, and experimental fabrication space for collaborative work with public and private partners.

[1] A full-time equivalent (FTE) student is a student taking a full course load of 15 credits. Three part-time students, each taking five credits, would be considered one FTE student.

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The new building would accommodate a portion of the previously approved 850 FTE students; the proposed Project does *not* include or propose an increase in student enrollment over the previously approved level. Existing faculty plus four new faculty members would staff the new facility; no other additional university staff or personnel would be added to the campus population as a result of the proposed Project.[2]

Figure A shows a project vicinity map, depicting the location of the existing campus structures. ***Figure B*** shows a project area map. *Figure C* contains a map of the proposed building.

A summary of the traffic impact analysis presented in the 2003 EIR in support of the approved Campus Master Plan is presented below, followed by additional analysis specific to the proposed Project.

A. Campus Master Plan EIR Traffic Impact Analysis

In 2003, Linscott, Law and Greenspan (LLG) conducted a traffic impact analysis (TIA) pursuant to the requirements of the California Environmental Quality Act (CEQA) for the then proposed SDSU Brawley Campus Master Plan. The Brawley campus is located in the eastern portion of the city of Brawley, approximately one-quarter mile west of McConnell Road on the north side of SR-78. The TIA analyzed the potential transportation-related impacts associated with development of the campus, including an FTE student enrollment of 850. The project analyzed in the traffic study included the development of new classrooms and administrative buildings that would provide the necessary facilities to serve up to 850 FTE students. The complete traffic study, *Traffic Impact Analysis San Diego State University Off-Campus Center Brawley, California* (March 19, 2003, LLG), is attached to this memorandum as ***Appendix A***.

Table 2 of the TIA shows that the campus at buildout, with an enrollment of 850 FTE students, would generate 2,000 Average Daily Trips (ADT), with 170 AM peak hour trips and 200 PM peak hour trips. LLG used the Institute of Traffic Engineers (ITE) trip rates to calculate the number of peak hour trips that would be generated by the campus at buildout.

The study area analyzed in the TIA included the following 8 intersections and 6 street segments (See TIA Tables 3A and 4).

Intersections:

1. SR-78 / SR-86

[2] SDSU reports that approximately 45 FTE students were enrolled for the Fall 2022 semester at the Brawley campus.

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2. SR-78 / SR-111 W.
3. SR-111 / Shank Road
4. SR-78 / SR-111
5. SR-78 / Project Access Driveway
6. SR-78 / McConnell Road
7. McConnell Road / Schwartz Road
8. SR-78 / Seybert Road

Street Segments:

1. SR-78: West of SR-86 S.
2. SR-78: SR-86 S. to SR-111 W.
3. SR-78: SR-111 S. to McConnell Road
4. SR-78: McConnell Road to SR-115
5. SR-86: South of SR-78
6. SR-111: North of Shank Road
7. SR-111: South of SR-78

The analysis presented in the TIA concluded that the future Brawley campus, with a buildout enrollment of 850 FTE students, would result in significant cumulative impacts at the SR-78 / SR-111 intersection, the segment of SR-111 south of SR-78, and at the campus access point to SR-78.

To mitigate the identified significant impacts, the Final EIR included the following mitigation measures, which were drafted based on the improvements recommended in the TIA (see Final EIR Mitigation Monitoring and Reporting Program (MMRP) page 11-3). The mitigation measures were adopted by the California State University Board of Trustees, and all of the improvements encompassed by the measures have been implemented to date, with the exception of signalization of the SR-78 / SR-111 intersection because the necessary signal warrants have not yet been met (i.e., the intersection does not yet generate sufficient traffic volumes to warrant signalization). (Existing/current road configurations were noted via Google Maps.)

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- Provision of an eastbound left-turn pocket and a westbound right-turn pocket on SR-78 at the project access point, provision of a dedicated southbound left-turn lane and right-turn lane at the project driveway approaching SR-78 shall be completed by Caltrans.
- Caltrans shall ensure that County of Imperial standards are applied to the corner sight distance at the campus access point.
- The eventual signalization of the SR-78 / SR-111 intersection, including dedicated northbound left-turn lane with a shared through-right turn lane shall be completed by Caltrans.

  Note that in addition to the above described improvements, right-of-way consistent with Caltrans standards has been dedicated along the project frontage. As previously mentioned, the access point to SR-78 at the SR-78 / SR-111 intersection remains unsignalized since signal warrants are not met.

B. Project Specific Analysis

The analysis presented below addresses the potential project-specific transportation related impacts associated with construction and development of the STEM building. The previously certified EIR analyzed the potential traffic impacts associated with development of the current approved Brawley Campus Master Plan at a program level of review. As previously noted, that analysis considered the potential impacts associated with a student enrollment of 850 FTE students. Because the proposed Project would not increase student enrollment beyond the number analyzed in the 2003 TIA and related EIR, no further analyses of vehicle trips that would be generated by the student body or faculty/staff is necessary or required.

The following thresholds of significance are based on CEQA Guidelines Appendix G, XVII Transportation. The proposed project would have a potential significant transportation-related effect if the project would:

a) Conflict with a program, plan, ordinance or policy addressing the circulation system, including transit, roadway, bicycle and pedestrian facilities?

b) Conflict or be inconsistent with CEQA Guidelines Section 15064.3, subdivision (b)?

c) Substantially increase hazards due to a geometric design feature (e.g., sharp curves or dangerous intersections) or incompatible uses (e.g., farm equipment)?

d) Result in inadequate emergency access?

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Would the project conflict with a program, plan, ordinance or policy addressing the circulation system, including transit, roadway, bicycle and pedestrian facilities?

The proposed Project would be constructed and developed consistent with the previously approved 2003 Campus Master Plan for the SDSU Brawley campus. The Project would be built generally on the site of Building 102 as designated on the approved Campus Master Plan. Additionally, the proposed Project does not include any improvements to the Brawley circulation system, including transit, roadway, bicycle, or pedestrian facilities. Any improvements constructed relating to the proposed Project would be constructed on-site and would be consistent with the Campus Master Plan and any applicable CSU policies. Accordingly, the impacts would be **less than significant.**

Would the project conflict or be inconsistent with CEQA Guidelines Section 15064.3, subdivision (b)?

CEQA Guidelines section 15064.3, subdivision (b), provides the criteria for analyzing transportation impacts based on a vehicle miles traveled (VMT) metric. Generally, VMT exceeding an applicable threshold of significance may indicate a significant impact requiring mitigation. Projects that decrease VMT in the project area compared to existing conditions should be presumed to have a less than significant transportation impact. Additionally, if existing models or methods are not available to estimate the VMT for a particular project, a lead agency may analyze the project's VMT qualitatively, taking into account such factors as the availability of transit, proximity to other destinations, etc. For many projects, a qualitative analysis of construction traffic may be appropriate. A lead agency has discretion to choose the most appropriate methodology to evaluate a project's VMT.

In terms of construction traffic, construction of the proposed Project would entail 7,500 cubic yards of fill that would be cut on campus and then reused on the Project site. Because the cut and fill process will be balanced on-site, there would be no import or export related vehicle trips and no VMT generated in connection with this process. As to vehicle trips generated by material deliveries, worker trips, etc., based on the relatively small building to be constructed (66,000 SF), it is our professional judgment that construction-related trips would generate a nominal amount of vehicle trips and associated VMT. Moreover, VMT associated with heavy duty truck trips (as opposed to light-duty and passenger vehicle trips) is not considered as part of the CEQA VMT analysis. For these reasons, impacts related to construction-related vehicle trips would be **less than significant**.

As to those vehicle trips that would be generated in connection with operation of the STEM building, as previously explained, vehicle trips associated with a student

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enrollment of 850 FTE were previously analyzed as part of the 2003 certified EIR, with appropriate mitigation recommended and implemented. As the proposed Project would not increase, or result in an increase above, the previously approved enrollment, there would be no additional vehicle trips associated with the operation of the Project and, therefore, no further analysis under CEQA is required.

For information purposes, we note that one of the key inputs into VMT calculations is trip length. The presence of the SDSU satellite campus in Brawley allows students that live in Brawley or elsewhere in Imperial County to drive a shorter distance than if they attended another university. For instance, a student living in downtown Brawley would need to drive 6 miles one-way to the SDSU Brawley campus. However, if that same student were to attend SDSU or UC Riverside, the student would need to travel a much greater distance and, thereby, would generate substantially more VMT.

For comparative purposes, we note that the distances to other comparable campuses are much longer.

- Brawley to San Diego State University 120 miles
- Brawley to UC Riverside 160 miles
- Brawley to CSU San Bernardino 150 miles

Due to the far greater distances to travel to other universities, it is reasonable to conclude that the proposed Project would result in reduced trip lengths and, hence, reduced VMT than if the student were traveling to another campus.

Thus, the STEM facility is analogous to opening a neighborhood Starbucks or other local serving facility. These types of facilities are presumed under VMT analyses to shorten trips and reduce areawide VMT because the patrons of such establishments no longer need to travel to more distant locations. (See, Office of Planning and Research (OPR) Technical Advisory (December 2018, page 16.). For these reasons, it is our professional judgment that the proposed Project would have an overall positive effect on VMT.

Would the project substantially increase hazards due to a geometric design feature (e.g., sharp curves or dangerous intersections) or incompatible uses (e.g., farm equipment)?

The proposed Project would not increase transportation / geometric "hazards" as all Project traffic would use the existing campus access driveway, which is built to Caltrans standards. Any internal campus roads that would be built as part of the project would be designed to applicable standards and as such would not include

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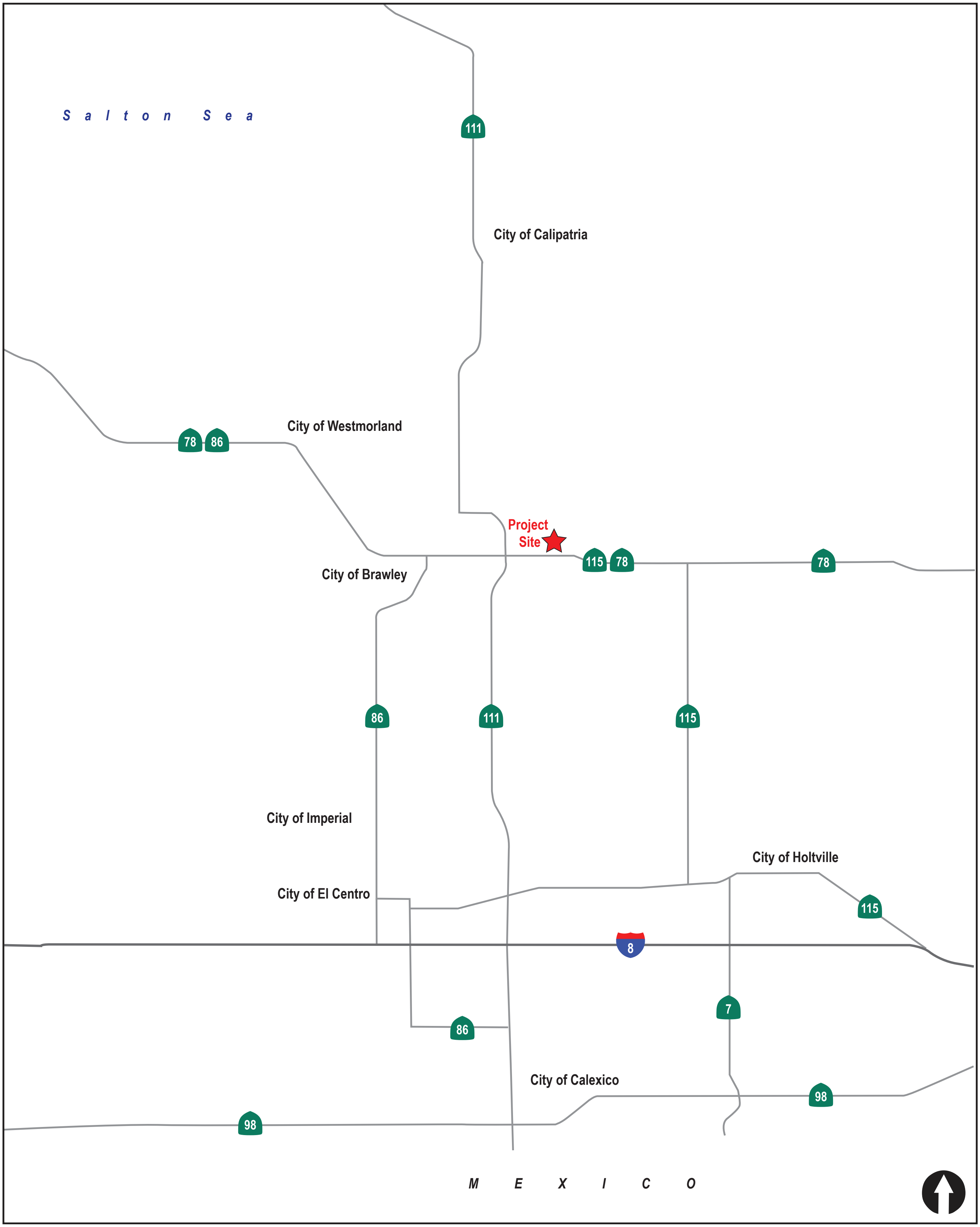
sharp curves or dangerous intersections. Additionally, the Project does not include incompatible uses that would require the use of corresponding equipment incompatible with existing vehicular traffic, such as farm equipment. For these reasons, impacts related to hazards would be **less than significant**.

Would the project result in inadequate emergency access?

Under the proposed project, emergency access would be provided, as it currently is, via the campus access point to SR-78. Since this access is built to Caltrans standards and the proposed project would not alter the existing access, adequate emergency access would be maintained. As such, impacts related to emergency access would be **less than significant**.

cc: File

Attachments: ***Figure A***: Vicinity Map
Figure B: Project Area Map
Figure C: Proposed Building
Appendix A:2003 Traffic Impact Analysis



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Date: 03/27/23

Figure A

Vicinity Map

BRAWLEY STEM FACILITY

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Date: 03/27/23

Figure B

Project Area Map

Brawley STEM Facility

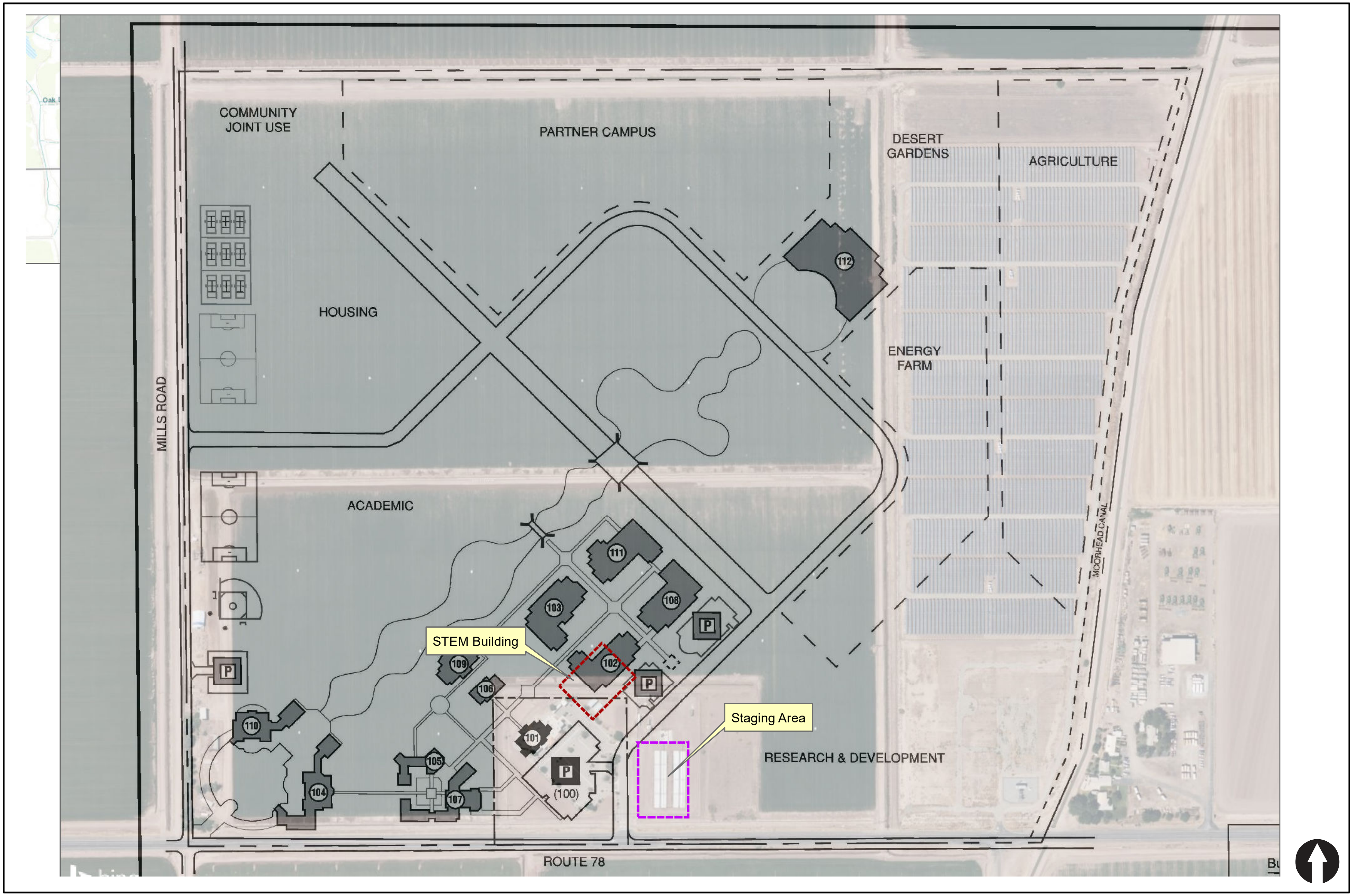

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Figure C

Proposed Building

Brawley STEM Facility

APPENDIX A

2003 TRAFFIC STUDY

TRAFFIC IMPACT ANALYSIS
SAN DIEGO STATE UNIVERSITY OFF-CAMPUS CENTER
BRAWLEY, CALIFORNIA

February 13, 2003
Revised: March 19, 2003

Prepared by:

LINSCOTT
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TRAFFIC IMPACT ANALYSIS
SAN DIEGO STATE UNIVERSITY OFF-CAMPUS CENTER
BRAWLEY, CALIFORNIA

1.0 INTRODUCTION

Linscott, Law & Greenspan Engineers (LLG) has been retained to assess the traffic implications due to the construction of an off-campus center, operated by San Diego State University in the City of Brawley. The campus would be constructed in two phases. The first phase of the project would be limited to 350 full time equivalent students (FTE) and the second phase would increase the equivalent enrollment to 850 (FTE).

Figure 1 sets out the site vicinity.

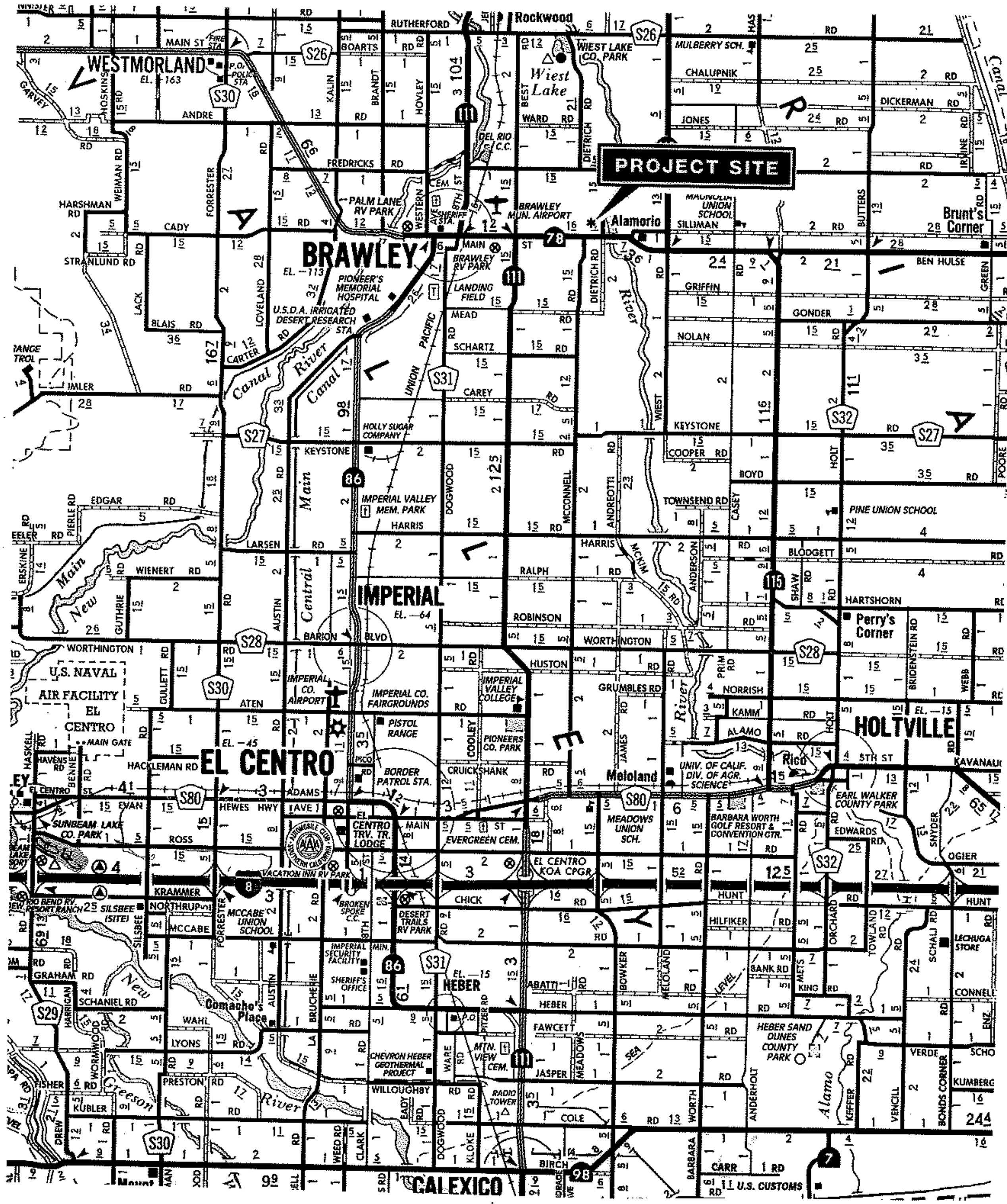
The subject site is located in the eastern portion of the City of Brawley, approximately one quarter-mile west of McConnell Road and one and a-quarter-miles east of Best Road on the north side of State Route 78 (SR 78). Access will be provided via one driveway to SR 78.

1.1 Study Methodology

The following study methodology was adopted for the traffic study, and can be broken into three distinct steps. The first step involved the assessment of the existing traffic conditions in the study area, and includes an inventory of roadway geometries, observations of traffic flow, and the collection of peak period traffic counts.

In the second step of the study, future traffic conditions were forecasted building on the collected existing data. Traffic forecasts reflect traffic generation and the distribution of project traffic.

The third step involved intersection and street segment performance analysis and identification of operational issues. Significant impacts, within the study area were identified, and mitigation measures recommended as appropriate.



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NO SCALE

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Figure 1

VICINITY MAP

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1.2 Study Area

The study area for this project encompasses areas of anticipated impact related to the project. Intersections where the project is anticipated to add over 50 peak hour trips were analyzed.

Included in this traffic study are the following chapters:

- Site Context;
- Traffic Forecasts;
- Traffic Operational Analysis;
- Year 2030 Operations; and
- Significance of impacts/Mitigation measures.

2.0 SITE CONTEXT

2.1 Project Description

The project proposes to construct an off-campus center, which would be operated by San Diego State University (SDSU). The project includes the development of new classrooms and administrative buildings to provide facilities for up to 850 full time equivalent students (FTE). The campus will be constructed in two phases, with the first phase of the project accommodating 350 FTE and the second phase accommodating the ultimate number of students at 850 FTE, an increase of 500 FTE. The campus is located in the eastern portion of the City of Brawley, approximately one quarter-mile west of McConnell Road and one and a-quarter-miles east of Best Road on the north side of State Highway 78.

Phase I is anticipated to be completed in 1 year and Phase II by 2009.

Access to campus parking will be via one driveway to SR 78 and serve two main parking areas on the eastern side of the campus. **Appendix A** contains the conceptual site plan.

2.2 Existing Street System

According to County of Imperial Public Road Standards, Primary Arterials should be 80 feet wide in 100 feet of Right-of-Way (R/W), providing four thru lanes, and a raised or painted median. Major Roads should be 60 feet wide in 80 feet of R/W, providing four undivided thru lanes, and curbside parking. Collectors should be 40 feet wide in 60 feet of R/W providing two-thru undivided lanes.

The following is a general description of the roadways in the project area. **Figure 2** depicts the existing conditions including the lane geometrics of the key intersections in the study area.

State Route 78 is classified as a State Highway on the Imperial County Circulation Element and is an east/west route within the project area. State Route 78 is constructed as a four-lane conventional highway (two travel lanes in each direction) from SR 86 to SR 111 through the incorporated City of Brawley. This portion of SR 78 provides no bike lanes, but does provide bus stops and has a posted speed limit of 30 mph. A portion of SR 78 between SR 111 W. and SR 111 S. is constructed as a 4-lane undivided roadway with a Two Way Left turn lane (TWLTL) median. East of SR 111, SR 78 is constructed as a two-lane undivided roadway providing no bike lanes or bus stops. This portion of SR 78 has a posted speed limit of 65 mph.

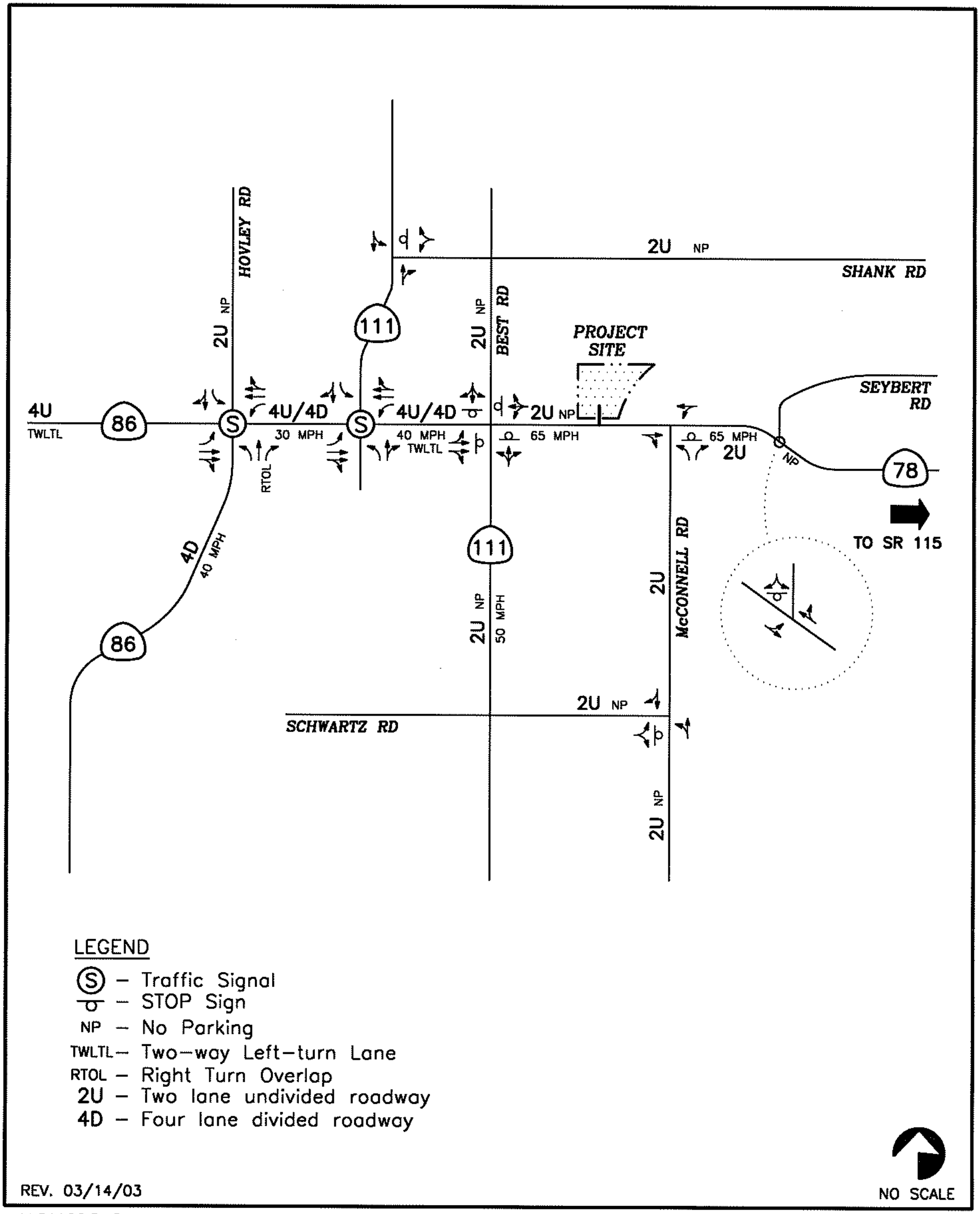

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Figure 2

EXISTING CONDITIONS DIAGRAM

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State Route 111 is classified as a State Highway on the Imperial County Circulation Element and is a north/south route within the project area. SR 111 is constructed as a 2-lane undivided roadway providing no bike lanes or bus stops, and a posted speed limit of 50 mph. SR 111 W. is currently offset to the west from the southern portion of SR 111, which runs from SR 78 south to I-8.

State Route 86 (SR 86) is classified as a State Highway on the Imperial County Circulation Element and is a north/south route within the project area. This facility parallels the western side of the Salton Sea, joining with SR 78 south of Salton City, and continues through Westmorland to Brawley and terminates at SR 111. SR 86 is constructed as a four-lane roadway within the project vicinity providing no bike lanes or bus stops. Parking is prohibited along both sides of the roadway.

Hovley Road is an unclassified 2-lane roadway within the City of Brawley providing no bike lanes or Bus stops. Parking is permitted along both sides of the roadway.

Best Road is an unclassified 2-lane undivided roadway within the City of Brawley providing no bike lanes or Bus stops. Parking is prohibited along both sides of the roadway.

McConnell Road is classified as a Local Collector in the Imperial County Circulation Element. It is currently constructed as a two-lane undivided roadway with no posted speed limit or bike lanes within the project area.

Shank Road is classified as a Local Collector in the Imperial County Circulation Element. It is currently constructed as a two-lane undivided roadway with no posted speed limit or bike lanes within the project area.

Seybert Road is an unclassified 2-lane undivided roadway within the City of Brawley providing no bike lanes or Bus stops. Parking is prohibited along both sides of the roadway.

Schwartz Road is an unclassified 2-lane undivided roadway within the City of Brawley providing no bike lanes or Bus stops. Parking is prohibited along both sides of the roadway.

3.0 TRAFFIC FORECASTS

3.1 Existing Traffic Volumes

Existing weekday morning and afternoon traffic volumes were established at key area intersections to capture peak commuter activity. Existing AM and PM counts were conducted by LLG in March 2002 at the key intersections selected for analysis. Existing Average Daily Traffic (ADT) volumes were obtained from the *Caltrans State Highway Traffic Volumes Book* (Year 2000). **Table 1** displays the existing ADTs. **Figure 3** depicts the existing AM / PM peak hour turning movement counts and ADTs within the study area. **Appendix B** contains copies of the intersection manual and ADT volumes sheets. The key signalized and unsignalized intersections within the project area are listed below:

Signalized Intersections

- SR 78 / SR 86; and
- SR 78 / SR 111 (West).

Unsignalized Intersections

- SR 78 / SR 111 (South);
- SR 78 / Project Access Driveway;
- SR 78/ McConnell Road;
- SR 78/ Seybert Road;
- SR 111/ Shank Road; and
- McConnell Road/Schwartz Road.

Table 1
Existing Daily Traffic Volumes

SEGMENT	YEAR	ADT
SR 78		
West of SR 86	2000	18,600
SR 86 to SR 111 (West)	2000	26,000
SR 111 (South) to SR 115	2000	3,200
SR 86		
South of SR 78	2000	17,400
SR 111		
North of Shank Road	2000	6,200
South of SR 78	2000	7,300

Source: Caltrans Highway Traffic Volumes, 2000
1) ADT – Average Daily Traffic Volume

3.2 Project Traffic Generation

Trip generation estimates for the proposed development were calculated based on Institute of Transportation Engineers (ITE) rates for a College Campus. The amount of equivalent students (850) used to formulate a trip generation were based on the *Enrollment Needs Study for Imperial County prepared* by the California State University Chancellor's office in July 2001. **Table 2** tabulates the project traffic generation for phases I and II. The project is calculated to ultimately generate approximately 2,000 ADT with 130 inbound / 40 outbound trips during the AM peak hour and 60 inbound / 140 outbound trips during the PM peak hour. It should be noted that it was found that deriving the project trip generation based on acreage (Phase I acreage is 5.04) rather than students (FTE) would result in less traffic. Therefore, using students as the trip generation variable results in a conservative estimation of traffic.

Table 2
Project Trip Generation

PHASE	LAND USE	AMOUNT	DAILY TRIP ENDS		AM PEAK HOUR				PM PEAK HOUR			
			RATE	ADT	PEAK %	IN:OUT	VOLUME IN	VOLUME OUT	PEAK %	IN:OUT	VOLUME IN	VOLUME OUT
I	College Campus	350 Students	2.38[2]	830	9%	75:25	50	20	10%	30:70	25	60
II	College Campus	850[1] Students	2.38[2]	2,000	9%	75:25	130	40	10%	30:70	60	140

NOTES:
1 850 (FTE) students based on findings concluded from *Enrollment Needs Study for Imperial County.*
2 Source: Institute of Transportation Engineers Manual, 5th Ed., Code 550.
3 ADTs rounded to nearest 100 and peak hour volumes rounded to nearest 5.

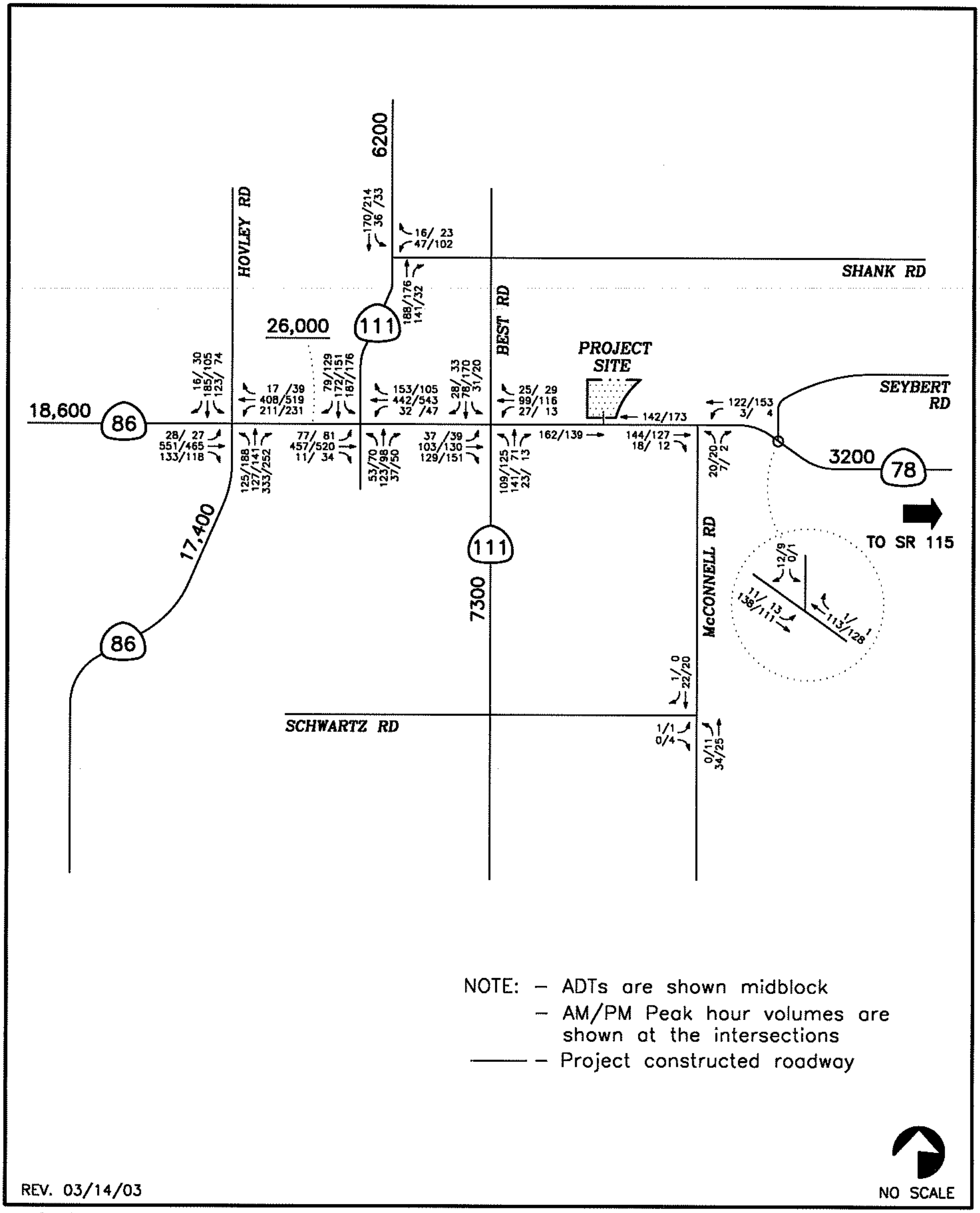

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Figure 3

EXISTING TRAFFIC VOLUMES AM/PM PEAK HOURS & ADTs

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3.3 Project Traffic Distribution / Assignment

The project-generated traffic was distributed and assigned to the street system based on roadway system characteristics (i.e. project's proximity to SR 78, SR 86, and SR 111), and Table 6A from the *Enrollment Needs Study for Imperial County* depicting Imperial County Regional Populations and Imperial Valley Campus (IVC) Enrollments. This table is included in **Appendix C**. Project traffic will access parking via SR 78 only. Appendix A contains the conceptual site plan.

Figure 4 shows the project trip distribution percentages. **Figure 5** shows the assignment of project phase I traffic and **Figure 5a** show the assignment of the ultimate total project traffic. **Figure 6** shows the existing + project phase I traffic.

3.4 Cumulative Projects

Since there are other potential projects in the area which could generate traffic in the near term, additional cumulative traffic was added to the existing + project traffic volumes. Three specific projects were included as outlined below, based on discussions with County staff. **Appendix D** contains the cumulative traffic data utilized for this report.

Brawley Beef Processing Plant is a proposed beef processing facility located north of Shank Road and east of SR 111. The project is calculated to generate 918 ADT, with 365 inbound/65 outbound trips during the AM peak hour and 65 inbound/365 outbound trips during the PM peak hour. Traffic data was taken from traffic study prepared by Darnell & Associates (July 2000).

Luckey Ranch is a proposed mixed-use development within the City of Brawley and extending into the County of Imperial. The project consists of single and multi-family housing, commercial and industrial usage, as well as community and neighborhood parks. For the purpose of this report, Phase I (0-5 years) project traffic was utilized for near-term cumulative traffic data. The entire project is included in the 2030 analysis as a long-term cumulative project. Phase I of the project is estimated to generate 6,047 ADT with 615 inbound/134 outbound trips during the AM peak hour and 131 inbound/493 outbound trips during the PM peak hour. Appendix D contains the trip generation table calculated by LLG. Traffic data was taken from traffic study prepared by Darnell & Associates (July 1999). Unfortunately, this study only includes an ADT assignment of project traffic and not a peak hour assignment.

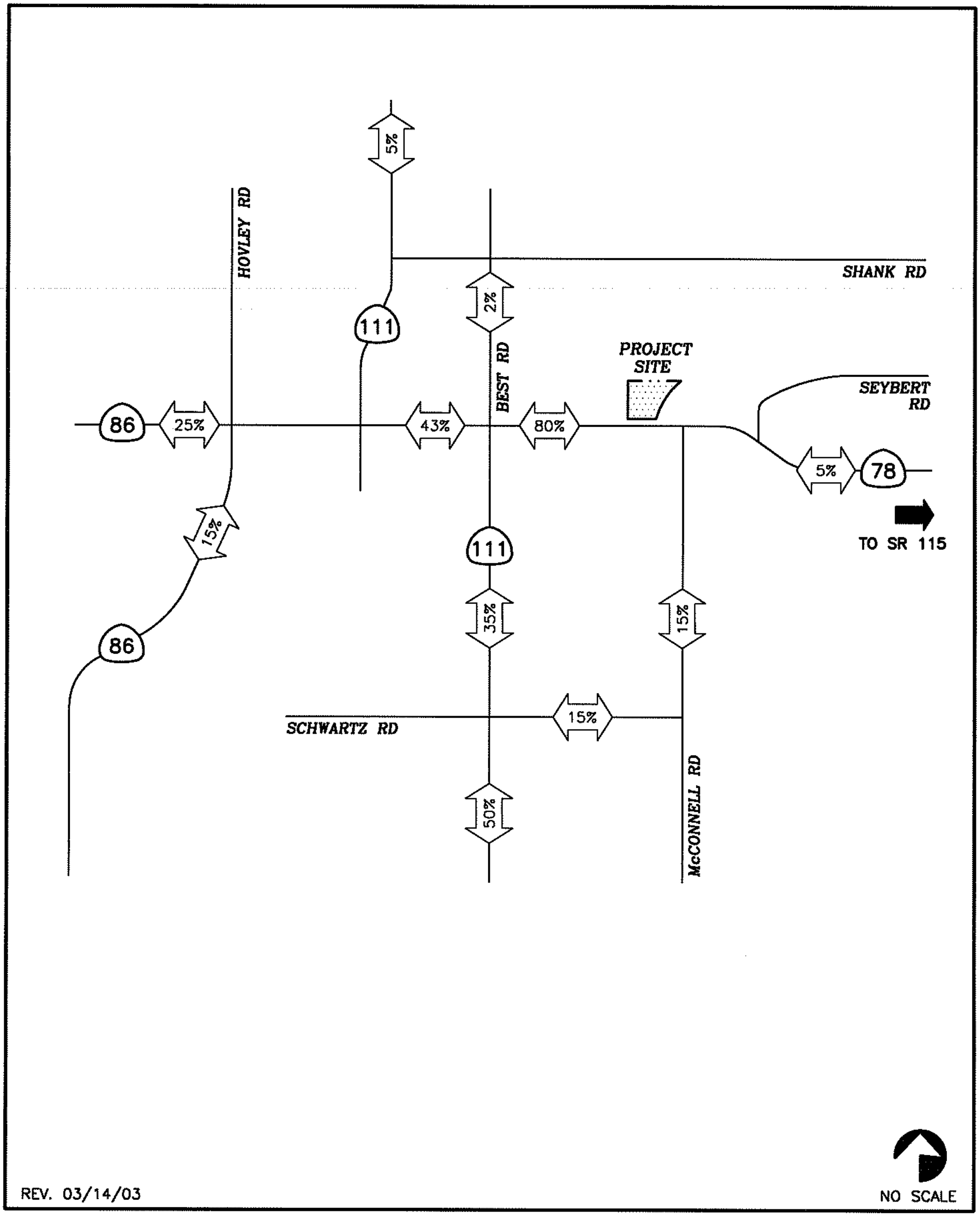

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Figure 4

REGIONAL TRIP DISTRIBUTION

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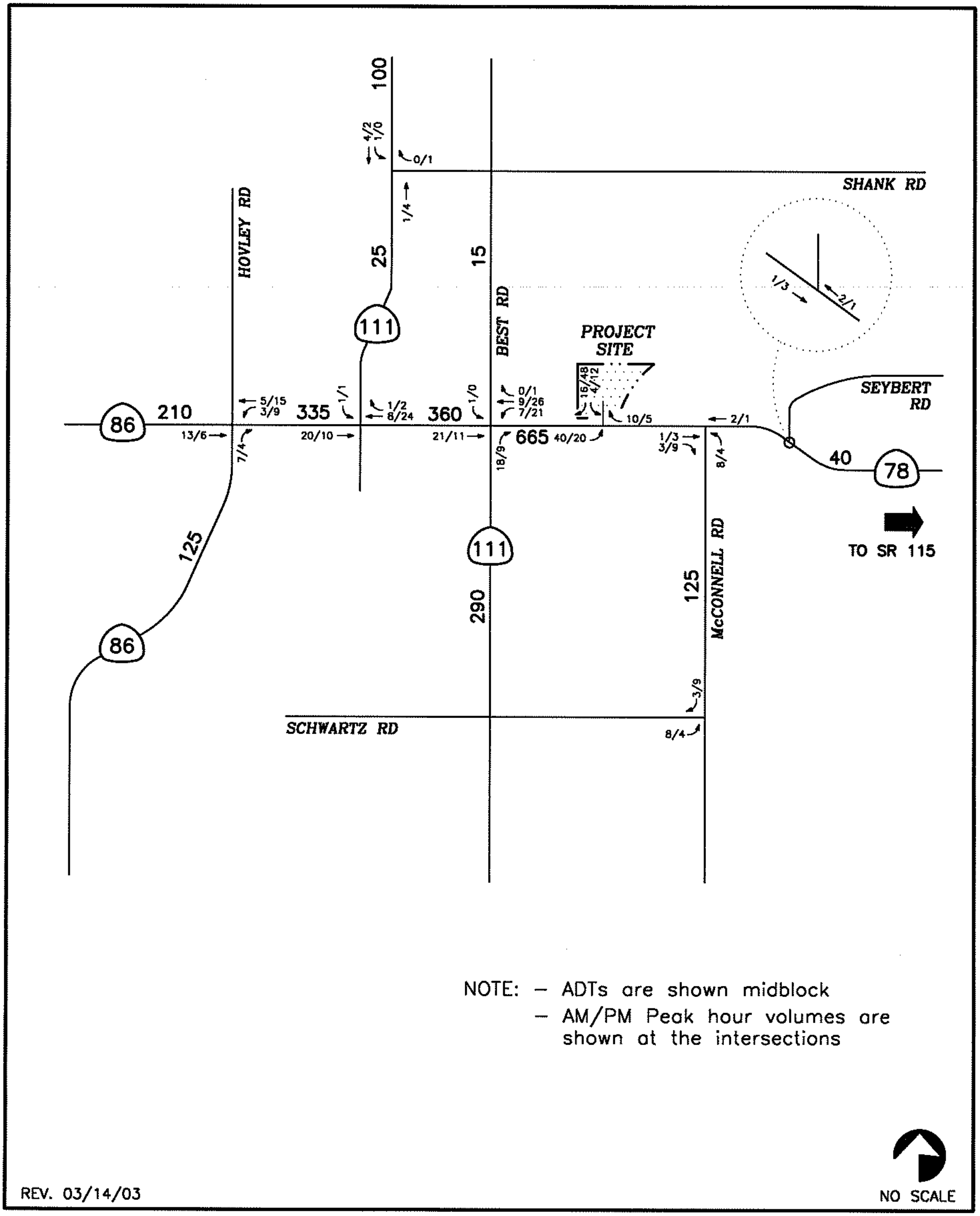

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Figure 5

PHASE I PROJECT TRAFFIC VOLUMES
AM/PM PEAK HOURS & ADTs

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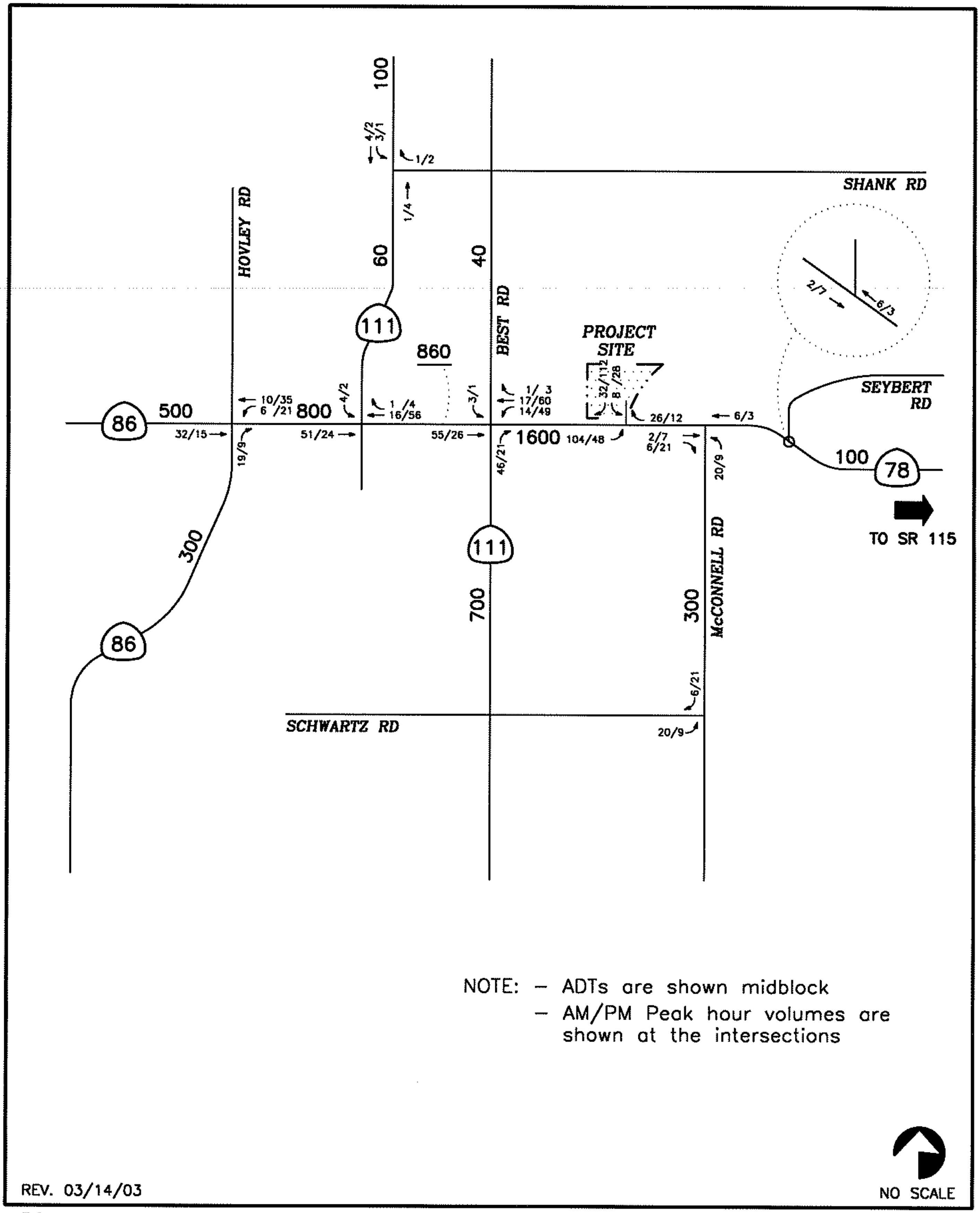

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Figure 5a

TOTAL PROJECT (Phases I & II) TRAFFIC VOLUMES AM/PM PEAK HOURS & ADTs

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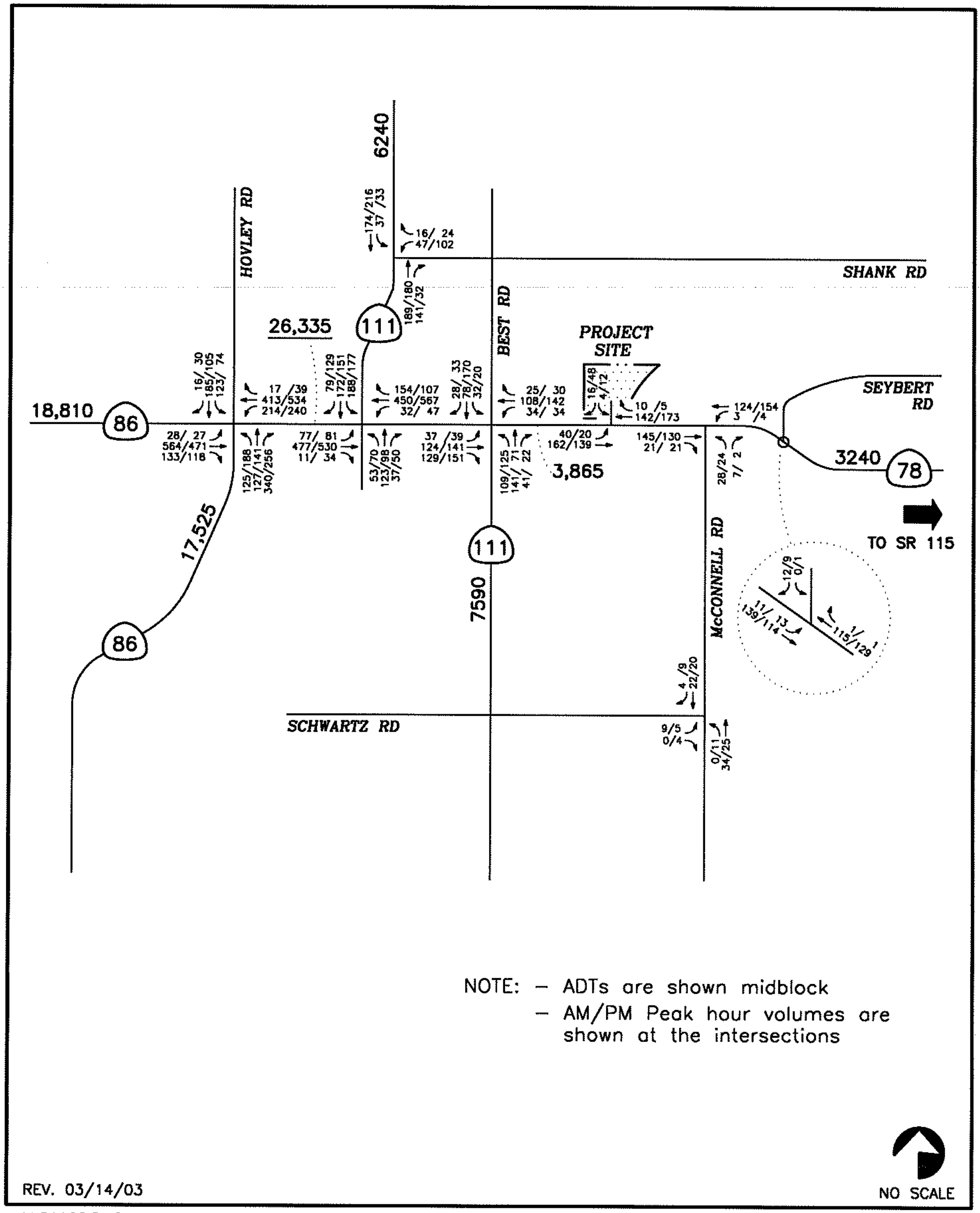

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Figure 6

EXISTING + PROJECT PHASE I TRAFFIC VOLUMES AM/PM PEAK HOURS & ADTs

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The Brawley Bypass Project proposes to adopt a new alignment and construct a four-lane expressway in Imperial County from SR 86 northeast of the city of Brawley, to SR 111, southeast of the city of Brawley. Three alignment alternatives are proposed. For the purpose of this report, this project was only included in the long-term cumulative analysis (2030), utilizing Table 1-1 (Traffic Projections) of the *Brawley Bypass* Draft Environmental Impact Report (DEIR), prepared by CALTRANS in May 2001 (see Appendix D).

In addition, a **growth factor** of 21% (3% per year for 7 years) was added to the existing traffic volumes to account for general growth within the project area and an assumed Phase II completion year of 2009. To be conservative, the Brawley Bypass was assumed to not be completed prior to 2009. However, the Brawley Bypass was assumed to be in for the 2030 analysis.

Figure 7 shows the total cumulative projects traffic volumes. The resultant future traffic volumes (existing + growth + cumulative projects) are set out in **Figure 8**. **Figure 9** shows the existing + growth + cumulative projects + total project traffic volumes.

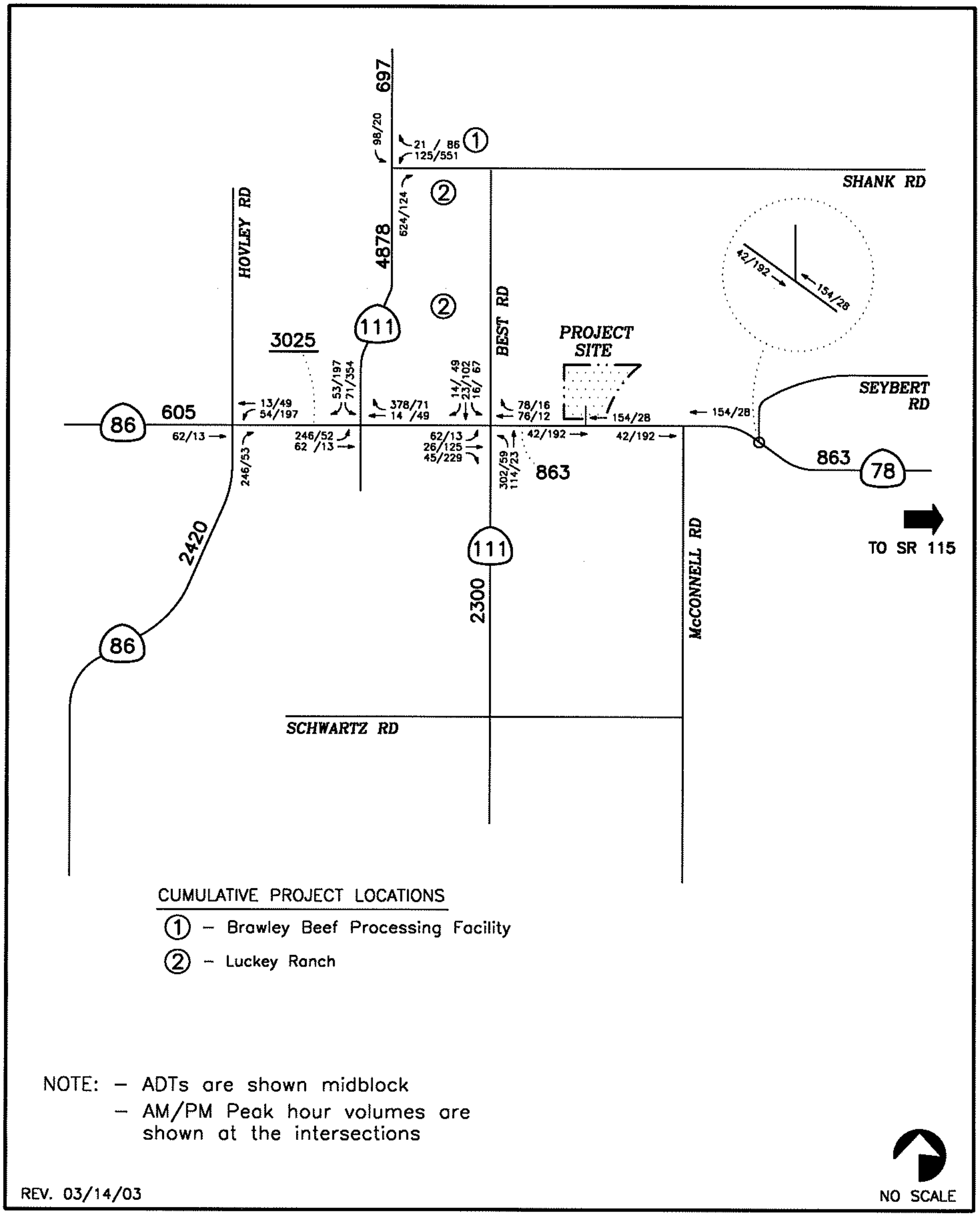

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Figure 7

CUMULATIVE PROJECTS TRAFFIC VOLUMES
AM/PM PEAK HOURS & ADTs

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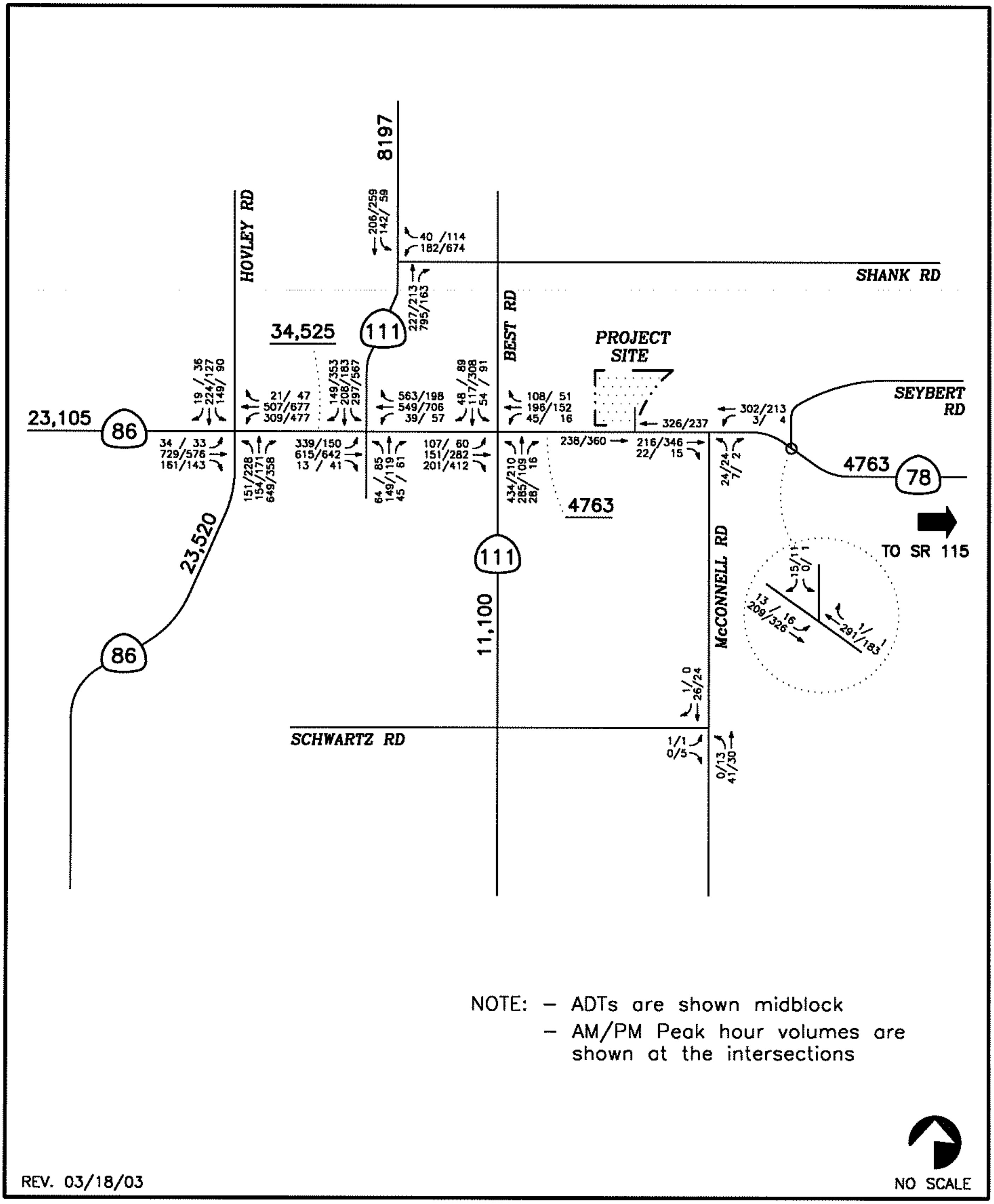

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Figure 8

EXISTING + GROWTH + CUMULATIVE PROJECTS TRAFFIC VOLUMES AM/PM PEAK HOURS & ADTs

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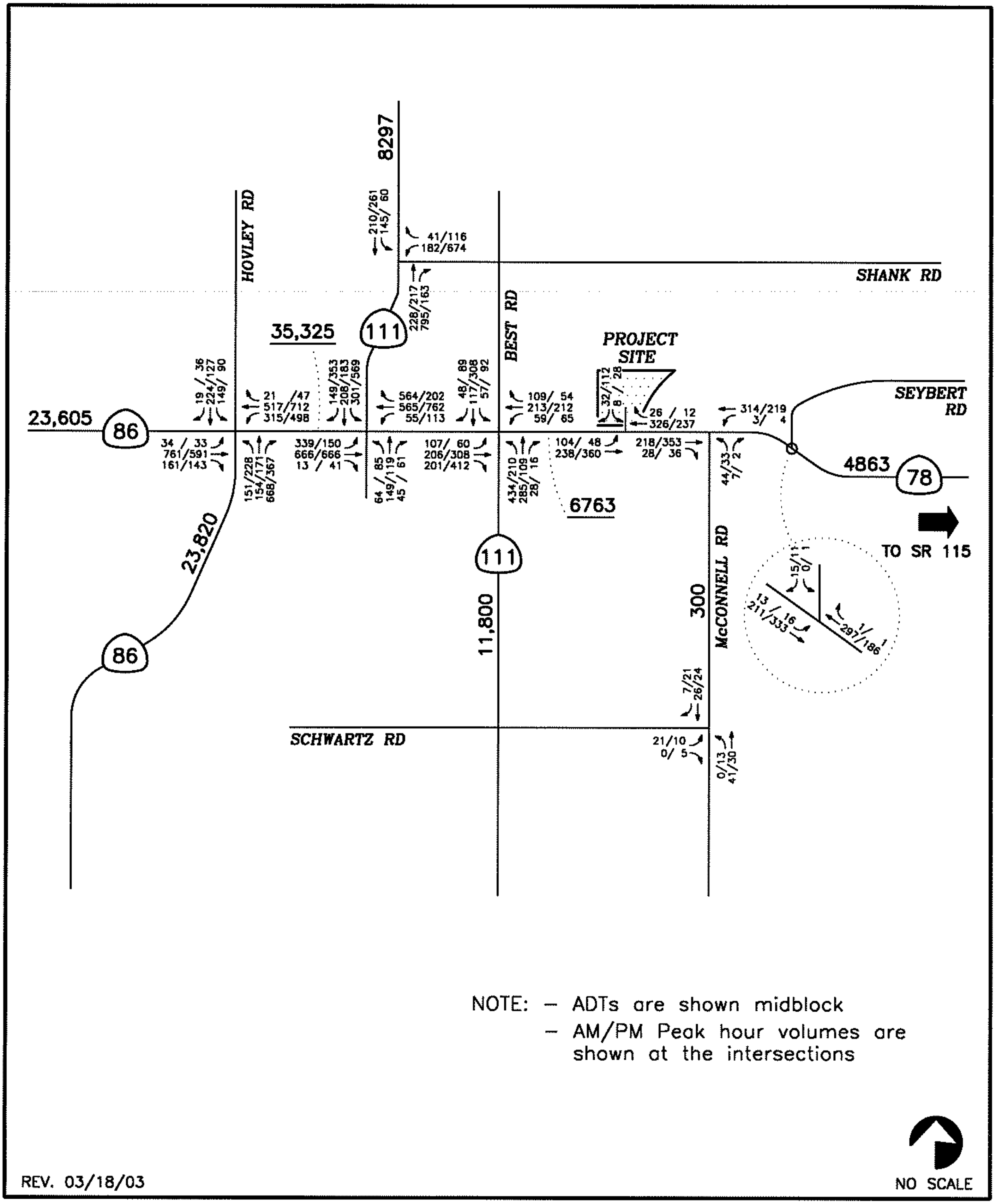

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Figure 9

EXISTING + GROWTH + CUMULATIVE PROJECTS + TOTAL PROJECT TRAFFIC VOLUMES AM/PM PEAK HOURS & ADTs

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4.0 TRAFFIC OPERATIONS ANALYSIS

4.1 Significance Criteria

A project traffic impact was considered significant if the addition of project traffic caused an intersection or street segment to operate at worse than LOS C, based on language contained in the Imperial County General Plan. If an intersection or street segment is calculated to currently operate at LOS D or worse, an impact is considered significant if the project causes intersection delays to increase by more than 2 seconds or the V/C ratio to degrade by more than 0.02.

4.2 Traffic Analysis Methodology

Level of Service (LOS) is the term used to denote the different operating conditions which occur on a given roadway segment under various traffic volume loads. It is a qualitative measure of the effect of a number of factors including roadway geometries, speed, travel delay, freedom to maneuver, and safety. Level of service provides an index to the operational qualities of a roadway segment or an intersection. Level of service designations range from A to F, with LOS A representing the best operating conditions and LOS F representing the worst operating conditions. Level of service designation is reported differently for signalized and unsignalized intersections, as well as for roadway segments as described below.

Signalized intersections were analyzed under weekday morning and afternoon peak hour conditions. Average vehicle delay was determined utilizing the methodology found in Chapter 16 of the *2000 Highway Capacity Manual (HCM),* with the assistance of the *Traffix* (version 7.5) computer software. The delay values (represented in seconds) were qualified with a corresponding intersection LOS. Signalized intersection calculation worksheets and a more detailed explanation of the methodology are attached in **Appendix E**. **Table 3a** reports signalized intersection operations during peak hour conditions. **Table 3b** shows the Intersecting Lane Volume (ILV) analysis for the signalized intersections. The ILV analysis sheets are attached in Appendix E.

Unsignalized intersections were analyzed under weekday morning and afternoon peak hour conditions. Average vehicle delay and Levels of Service (LOS) was determined based upon the procedures found in Chapter 17 of the *2000 Highway Capacity Manual (HCM),* with the assistance of the *Traffix* (version 7.5) computer software. Unsignalized intersection calculation worksheets and a more detailed explanation of the methodology are attached in **Appendix F**. **Table 4** reports unsignalized intersection operations during peak hour conditions.

Street segment analysis is based upon the comparison of daily traffic volumes (ADTs) to the Roadway capacities on the City of Brawley General Plan roadway classifications as shown in **Appendix G**. This table provides segment capacities for different street classifications, based on traffic volumes and roadway characteristics. **Table 5** outlines the near-term street segment analysis results with **Table 6** outlining Year 2030 street segment analysis results both with and without the proposed Brawley Bypass alignment of SR 78/SR 111.

4.3 Existing Operations

Table 3a shows under existing conditions, the key signalized intersections are calculated to operate at LOS C during both the morning and afternoon peak periods.

Table 3b shows under existing conditions, the key signalized intersections are calculated to operate at under capacity during both the morning and afternoon peak periods.

Table 4 shows under existing conditions, the minor street movements at each key unsignalized intersection are calculated to operate at LOS B or better during both the morning and afternoon peak periods.

Table 5 shows under existing conditions, all key segments are calculated to currently operate at LOS C or better.

4.4 Existing + Project Phase I Operations

Table 3a shows that with the addition of project phase I traffic, the key signalized intersections are calculated to continue to operate at LOS C during the morning and afternoon peak periods. The delays increases are very minimal (0.7 second maximum increase).

Table 3b shows with the addition of project - phase I traffic, the key signalized intersections are calculated to continue to operate at under capacity during both the morning and afternoon peak periods.

Table 4 shows that with the addition of project phase I traffic, the minor street movements at the key unsignalized intersections are calculated to continue to operate at LOS B or better during the morning and afternoon peak periods. The delays increase only slightly (0.8 second maximum increase).

Table 5 shows that with the addition of project traffic, all key segments are calculated to continue to operate at LOS D or better.

4.5 Existing + Growth + Cumulative Projects Operations

The following is a description of analysis results for this scenario.

Table 3a shows that the key signalized intersections are calculated to continue to operate at LOS C during the morning and afternoon peak periods.

Table 3b shows that the key signalized intersections are calculated to operate at near capacity during both the morning and afternoon peak periods using the Caltrans ILV method.

Table 4 shows that the minor street movements at the key unsignalized intersections are calculated to continue to operate at LOS B or better during the morning and afternoon peak periods with the exception of the minor street movement at the following two intersections which are calculated to operate at LOS F:

- SR 111 / Shank Road; and
- SR 78 / SR 111 S.

These poor levels of service are due to the large amount of traffic generated by Luckey Ranch.

Table 5 shows that with the addition of total project traffic, all key segments are calculated to continue to operate at LOS D or better with the exception of the following segments which are calculated to operate at LOS E.

- SR 78: SR 86 S. to SR 111 W.; and
- SR 111: South of SR 78.

These poor levels of service are due to the large amount of traffic generated by Luckey Ranch.

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4.6 Existing + Growth + Cumulative Projects + Total Project Operations

The following is a description of analysis results for this scenario.

Table 3a shows that the LOS D is calculated at the SR 78/SR 86 intersection during the morning and afternoon peak periods. However, the intersection of SR 78/SR 111 W. degrades to LOS E during both the morning and afternoon peak periods.

Table 3b shows with the addition of cumulative project traffic, the key signalized intersections are calculated to continue to operate at near capacity during the morning and afternoon peak periods.

Table 4 shows that the minor street movements at the key unsignalized intersections are calculated to continue to operate at LOS B or better during the morning and afternoon peak periods with the following exceptions which are calculated to continue operate at LOS F.

- SR 111/Shank Road; and
- SR 78/SR 111 S.

The Luckey Ranch Traffic Study recommends that a traffic signal be installed at the intersection of SR 111/Shank Road. LOS C is calculated with the installation of a traffic signal.

Table 5 shows that all segments are calculated to operate at LOS D or better with the following exceptions which are calculated to continue to operate at LOS E.

- SR 78: SR 86 S. to SR 111 W.; and
- SR 111: South of SR 78.

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Table 3a
Signalized Intersection Operations

Intersection	Peak Hour	Existing		Existing + Project Phase I		Existing + Growth + Cumulative Projects		Existing + Growth + Cumulative Projects + Total Project		Delay Increase due to Total Project	Sig[3]
		Delay[1]	LOS[2]	Delay	LOS	Delay	LOS	Delay	LOS		
SR 78/SR 86	AM	29.7	C	29.8	C	44.2	D	47.6	D	3.4	NO
	PM	27.4	C	28.1	C	35.9	D	37.1	D	1.2	NO
SR 78/SR 111 W.	AM	24.6	C	24.7	C	55.9	E	57.1	E	1.2	NO
	PM	24.4	C	24.6	C	49.5	D	52.3	D	2.8	NO

Notes:
1. Average delay expressed in seconds per vehicle.
2. Level of Service. See Appendix for delay thresholds.
3. Sig - Significant project impacts based on Significance Criteria.
4. Shading represents a significant impact.

SIGNALIZED
DELAY / LOS THRESHOLDS

DELAY	LOS
0.0 < 10.0	A
10.1 to 20.0	B
20.1 to 35.0	C
35.1 to 55.0	D
55.1 to 80.0	E
> 80.1	F

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Table 3b
Signalized Intersection Operations
ILV Methodology

Intersection	Peak Hour	Existing		Existing + Project Phase I		Existing + Growth + Cumulative Projects		Existing + Growth + Cumulative Projects + Total Project	
		ILV[1]	STATUS	ILV	STATUS	ILV	STATUS	ILV	STATUS
SR 78/SR 86	AM	786	UNDER	888	UNDER	1,277	NEAR	1,280	NEAR
	PM	846	UNDER	858	UNDER	1,228	NEAR	1,256	NEAR
SR 78/SR 111 W.	AM	722	UNDER	727	UNDER	1,386	NEAR	1,399	NEAR
	PM	755	UNDER	768	UNDER	1,349	NEAR	1,381	NEAR

Notes:
1. ILV – Intersection Lane Volume

STATUS

≤ 1,200 ILV/HR	UNDER CAPACITY
>1,200 but ≤ 1,500 ILV/HR	NEAR CAPACITY
> 1,500 ILV/HR	OVER CAPACITY

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TABLE 4
UNSIGNALIZED INTERSECTION OPERATIONS

INTERSECTIONS	CONTROL TYPE	PEAK HOUR	EXISTING		EXISTING + PROJECT PHASE I		EXISTING + GROWTH + CUMULATIVE PROJECTS		EXISTING + GROWTH + CUMULATIVE PROJECTS + TOTAL PROJECT		Sig[3]
			DELAY[1]	LOS[2]	DELAY	LOS	DELAY	LOS	DELAY	LOS	
SR 111 / Shank Road	TWSC[1]	AM	12.9	B	13.0	B	> 50.1	F	25.2	C*	NO
		PM	13.9	B	14.0	B	> 50.1	F	27.5	C*	NO
SR 78 / SR 111 S.	AWSC	AM	11.3	B	11.9	B	> 50.1	F	> 50.1 *29.1*	F *C***	YES[4]
		PM	11.7	B	12.5	B	> 50.1	F	> 50.1 *24.0*	F *C***	YES[4]
SR 78 / Project Access D/W	TWSC[1]	AM	DNE	DNE	9.5	A	DNE	DNE	12.1	B	NO
		PM	DNE	DNE	9.8	A	DNE	DNE	12.4	B	NO
SR 78 / McConnell Road	TWSC[1]	AM	10.2	B	10.4	B	12.3	B	13.2	B	NO
		PM	10.5	B	10.6	B	13.3	B	13.9	B	NO
McConnell Road / Schwartz Road	TWSC[1]	AM	8.8	A	8.9	A	8.9	A	9.0	A	NO
		PM	8.5	A	8.7	A	8.7	A	8.9	A	NO
SR 78 / Seybert Road	TWSC[1]	AM	9.0	A	9.0	A	10.1	B	10.1	B	NO
		PM	9.2	A	9.2	A	9.3	A	9.6	A	NO

NOTES:
1. Average delay expressed in seconds per vehicle and represents worst case minor street movement.
2. Level of Service
3. Significant project impacts based on Significance Criteria.
DNE - Does not exist
N/A - Not applicable since Driveway does not exist today.
AWSC - All Way Stop Controlled intersection
TWSC - Two Way Stop Controlled intersection
Shading represents a significant impact
* - LOS with traffic signal mitigation recommended in the Luckey Ranch Traffic Study.
** - LOS with recommended mitigation (installation of traffic signal).
4. A Significant cumulative impact is calculated.

UNSIGNALIZED
DELAY / LOS THRESHOLDS

DELAY	LOS
0.0 < 10.0	A
10.1 to 15.0	B
15.1 to 25.0	C
25.1 to 35.0	D
35.1 to 50.0	E
> 50.1	F

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Table 5
Near-Term Street Segment Operations

Street Segment	Classification	Existing Capacity (LOS E)[1]	Existing			Existing + Project Phase I			Sig[5]	Existing + Growth + Cumulative Projects			Existing + Growth + Cumulative Projects + Total Project			Project V/C increase	Sig
			ADT[2]	V/C[3]	LOS[4]	ADT	V/C	LOS		ADT	V/C	LOS	ADT	V/C	LOS		
SR 78																	
West of SR 86 S.	State Highway	37,000	18,600	0.50	B	18,810	0.51	B	NO	23,105	0.62	B	23,605	0.64	C	0.01	NO
SR 86 S. to SR 111 W.	State Highway	37,000	26,000	0.70	C	26,335	0.71	C	NO	34,525	0.93	E	35,325	0.95	E	0.02	NO
SR 111 S. to McConnell Road	State Highway	16,200	3,200	0.20	B	3,865	0.24	B	NO	4,763	0.29	C	6,763	0.42	C	0.12	NO
McConnell Road to SR 115	State Highway	16,200	3,200	0.20	B	3,240	0.20	B	NO	4,763	0.29	C	4,863	0.30	C	0.01	NO
SR 86																	
South of SR 78	State Highway	37,000	17,400	0.47	B	17,525	0.47	B	NO	23,520	0.64	B	23,820	0.64	B	0.01	NO
SR 111																	
North of Shank Road	State Highway	16,200	6,200	0.38	C	6,240	0.39	C	NO	8,197	0.51	D	8,297	0.51	D	0.01	NO
South of SR 78	State Highway	16,200	7,300	0.45	D	7,590	0.47	D	NO	11,100	0.69	E	11,800	0.73	E	0.04	YES

NOTES:
1. Capacity based on County of Imperial roadway classification.
2. Average Daily Traffic.
3. Volume to Capacity ratio.
4. Level of Service.
5. Significant project impacts based on Significance Criteria.

5.0 YEAR 2030 OPERATIONS

Year 2020 traffic volumes were taken from Table 1-1 of the *SR 78/SR 111 Brawley Bypass (DEIR)* study. This table depicts the Year 2020 ADTs both with and without the proposed SR 78/SR 111 alignment. Table 1-1 is included in **Appendix H**. These volumes were increased by 20% (2% per year over 10 years) to represent Year 2030 volumes.

Table 6 shows the addition of project traffic to the Year 2030 traffic volumes taken from Table 1-1. Table 6 shows that with the proposed SR 78/SR 111 Brawley Bypass alignment, all key segments are calculated to operate at LOS D or better. Table 6a shows that without the proposed SR 78/SR 111 alignment, all key segments are calculated to operate at LOS F.

Table 6
Year 2030 Street Segment Operations

			YEAR 2030* (With Bypass)			YEAR 2030* (Without Bypass)		
Street Segment	**Classification**	**Capacity (LOS E)[1]**	**YEAR 2030 + PROJECT**			**YEAR 2030 + PROJECT**		
			ADT[2]	**V/C[3]**	**LOS[4]**	**ADT[2]**	**V/C[3]**	**LOS[4]**
SR 78								
SR 86 S. to SR 111 W.	State Highway	37,000	27,360	0.74	C	48,960	1.32	F
SR 111 W. to SR 111 S.	State Highway	34,200	27,430	0.80	D	49,030	1.43	F
SR 111								
SR 78 to Adler Street	State Highway	57,000	18,070	0.32	A	24,070	1.49	F
SR 78 to Malan Street	State Highway	57,000	6,840	0.12	A	18,840	1.16	F

SOURCE: Table 1-1 from the CALTRANS SR 78/SR 111 Bypass report (May 2001).

NOTES:
1. Capacity based on County of Imperial roadway classifications.
2. Average Daily Traffic.
3. Volume to Capacity.
4. Level of Service.
5. Significant project impacts based on Significance Criteria.

* Includes project traffic.

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6.0 SIGNIFICANCE OF IMPACTS / MITIGATION MEASURES

Based on the established significance criteria, no significant direct project impacts were calculated.

No significant cumulative impacts are calculated at the signalized intersections since the project adds less than 2 seconds of delay to the intersections, which are calculated to degrade to LOS D or worse with cumulative traffic. A significant cumulative impact is calculated at the SR 78/SR 111 S. unsignalized intersection, since LOS F is calculated with the addition of cumulative and project traffic and the project adds over 2 seconds of delay and a significant cumulative impact is also calculated on SR 111, south of SR 78. In addition, significant impacts would occur if adequate access were not provided to the site via SR 78.

The following measures are recommended to mitigate impacts (by phase) to below a level of significance.

Project Phase I Mitigation:

1) Provide an eastbound left-turn pocket and a westbound right turn pocket on SR 78 at the project access point. In addition, provide a dedicated southbound left turn lane and right turn lane at the project driveway approaching SR 78.

2) Ensure corner sight distance meets Caltrans standards at the project driveway to SR 78.

3) Dedicate Right-of-Way (ROW) along the project frontage to ultimate SR 78 standards.

Total Project Mitigation:

4) Contribute a fair share towards the eventual signalization of the SR 78/SR 111 S. intersection. The northbound approach should provide a dedicated northbound left-turn lane with a shared through-right turn lane. This would mitigate the cumulative significant impact at both the SR 78/SR 111 S. intersection and the SR 111 segment, south of SR 78.

5) Annually monitor the SR 78/project driveway intersection for possible future signalization.