Appendix DR2-G
Risk Analysis of the SEDC Alternative to the Ventura Compressor Station Modernization Project

RISK ANALYSIS OF THE SEDC ALTERNATIVE TO THE VENTURA COMPRESSOR STATION MODERNIZATION PROJECT

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RISK ANALYSIS OF THE SEDC ALTERNATIVE TO THE VENTURA COMPRESSOR STATION MODERNIZATION PROJECT

EXECUTIVE SUMMARY

Southern California Gas Company (SoCalGas) retained Quest Consultants Inc.® (Quest) to identify and assess the potential hazards and risks associated with the Ventura Compressor Station. The initial study evaluated the hazards and risks associated with accidental releases of natural gas at the existing Ventura Compressor Station, as well as the Ventura Compressor Station Modernization Project (Proposed Project). A quantitative risk analysis (QRA) was used to analyze the risk of potentially life-threatening events occurring, due to accidental releases of natural gas from the compressor station. The scope of the QRA included compressors and associated equipment that contain natural gas, excluding gas transmission pipeline assets at the compressor station. The extended analysis presented in this report was limited to the supplemental electric-driven compressor installation only (SEDC) alternative to the Proposed Project.

A qualitative assessment of risk was initially performed for all project alternatives in response to the PEA Completeness Review Letter. The study described in this report evaluates the SEDC alternative, using a QRA methodology. For the SEDC alternative, the existing compressor station would remain in its current state and two new electric compressors and associated infrastructure would be installed, all of which would operate at the same conditions as were assumed for the Proposed Project. The SEDC alternative will provide the same total design throughput of the Proposed Project. The QRA study was limited to development of risk in the form of location-specific individual risk (LSIR) contours, for non-pipeline aspects of the SEDC system.

Assessment of the results from the QRA study for the SEDC alternative finds the following:

- The onsite risks for the SEDC alternative are similar to those for the Proposed Project.
- The offsite risks for the SEDC alternative are similar to those for the existing site and Proposed Project, although larger than either due to the use of the existing compressors and placement of new compressors.
- Offsite risk for the SEDC alternative reaches only industrial areas; it does not extend to any residential or commercial areas.
- When evaluated according to international risk criteria standards, the SEDC alternative would be found acceptable, similar to the Proposed Project.

1.0 INTRODUCTION

Southern California Gas Company (SoCalGas) retained Quest Consultants Inc.® (Quest) to identify and assess the potential hazards and risks associated with the Ventura Compressor Station. The existing Ventura Compressor Station is located at 1555 North Olive Street in Ventura, California. Quest's original study, dated July 2024[1], evaluated the hazards and risks associated with accidental releases of natural gas at the existing Ventura Compressor Station, as well as for the Ventura Compressor Station Modernization Project (Proposed Project). The Proposed Project seeks to replace aging infrastructure and compensate for the loss of local California producer supply in a discrete and targeted manner, without increasing SoCalGas's footprint or seeking to extend its pipeline system. The approach taken for that study was a quantitative risk analysis (QRA). Risk is based on the combination of both the severity and likelihood of a life-threatening event occurring. The risk analysis served to evaluate the Proposed Project in comparison to existing site conditions.

The Proposed Project is subject to a Certificate of Public Convenience and Necessity (CPCN) from the California Public Utilities Commission (CPUC) and California Environmental Quality Act (CEQA) review. The QRA studies were prepared as part of the Proponent's Environmental Assessment (PEA), submitted in accordance with the CPUC Guidelines for Energy Project Applications Requiring CEQA Compliance: Pre-Filing and Proponent's Environmental Assessments. Those assessments included an evaluation of the frequency and consequence of potential loss of containment scenarios, as well as identification of risk from such scenarios, accomplished by a QRA.

The original study also provided a qualitative risk assessment for alternatives to the Proposed Project identified in the PEA. The study described in this report extends the evaluation, using QRA methodology, to the SEDC alternative, which can then be compared to the Proposed Project.

1.1 Basis of the QRA

The QRA study analyzed the potential risk of fatality due to accidental releases of natural gas from a proposed compressor station. The scope of this QRA study included the compressor station equipment that would contain natural gas, which excludes gas transmission pipeline assets outside the boundaries the compressor station. The methodology used in this study includes five primary steps:

Step 1: Identify the hazards inherent with the system being evaluated.
Step 2: Determine the potential equipment failure cases that could result in life-threatening conditions in and around the facility.
Step 3: For each failure case defined in Step 2, calculate the set of potential hazard zones associated with a range of unique release events.

[1] https://www.socalgas.com/sites/default/files/Public_PEA_Appendix_S_Risk%20Assessment_July_2024.pdf

Step 4: For each unique release event identified in Step 3, derive the annual probability of the event, based on failure rates and conditional probabilities.

Step 5: Using a consistent and accepted methodology, combine the consequence from Step 3 with the corresponding event probabilities from Step 4 to arrive at measures of the risk posed by the facility. Compare the risk results to applicable criteria to develop an assessment of the overall risk.

This methodology is explained further in the July 2024 QRA report.

1.2 Alternative Site Assessment Overview

For the Proposed Project alternatives, a hazard identification and risk assessment approach was originally implemented. This qualitative assessment, which covered the viable alternatives to the Proposed Project, was separate and independent of the original QRA; the results of the qualitative assessment were presented in Quest's July 2024 report. The studies presented in this report expand that work to provide a quantitative measure of risk for the SEDC alternative.

1.3 Description of the Facilities

The existing Ventura Compressor Station is situated on 8.42 acres in the City of Ventura at 1555 North Olive Street. The facility supports SoCalGas's delivery of natural gas for two distinct yet interrelated purposes: (a) to serve core and non-core customer demand in the North Coastal System; and (b) to supply gas to the La Goleta Storage Field for injection and storage, which, in turn, supports future customer demand and reliability both in the North Coastal System and across the entirety of SoCalGas's system. The compressor station pulls natural gas from lower pressure pipelines to provide a source of higher pressure natural gas to the North Costal System and the La Goleta Storage Field. The Proposed Project would replace the existing compressor station equipment with new equipment — consisting of two inlet filter/separators, a compressor building with four compressors (two fueled by gas and two electrically driven), four fan-cooled heat exchangers, and an outlet scrubber. The new equipment will provide a gas throughput capacity of up to 160 MMSCFD.

For the SEDC alternative, it was assumed that the added compression equipment would expand the site such that the throughput and function would be equivalent to the Proposed Project. The scope of the SEDC alternative began and ended at the connection to gas pipelines (near pig launchers/receivers). This alternative involves a different layout for equipment and utilities, as compared to the Proposed Project, as it maintains the existing compression equipment and adds new facilities to expand the site's capacity. The proposed layout of the SEDC alternative is shown in Figure 1-1.

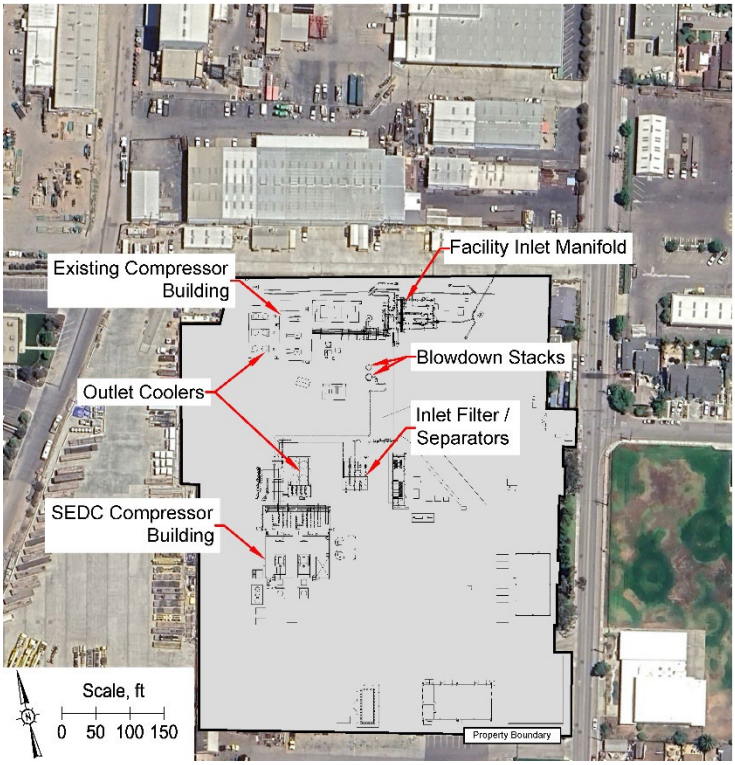

Figure 1-1
Layout of the SEDC Alternative

The analysis presented in this report generally follows the same methodology, assumptions, and basis as the QRA outlined in Quest's July 2024 report. The assumptions and parameters that differed from the original analysis are presented in Appendix A. Because the SEDC alternative would have somewhat different operating conditions when compared to the Proposed Project, a revised set of failure cases was developed. These failure cases are presented in Appendix C, and the corresponding hazard extents are given in Appendix D.

1.4 Acronyms and Abbreviations

A set of acronyms and abbreviations, and their meanings, are provided in Table 1-1.

Table 1-1
Acronyms and Abbreviations

Acronym or Abbreviation	Meaning
AIChE	American Institute of Chemical Engineers
Btu/hr-ft^2	British thermal units per hour per square foot (thermal radiation measurement)
CBC	California Building Code
CCPS	Center for Chemical Process Safety
CEQA	California Environmental Quality Act
49 CFR 192	Title 49 of the Code of Federal Regulations, Part 192
CPCN	Certificate of Public Convenience and Necessity
CPUC	California Public Utilities Commission
CSA	Canadian Standards Association
CSChE	Canadian Society for Chemical Engineering
HSE	Health and Safety Executive (United Kingdom)
kW/m^2	Kilowatts per square meter (thermal radiation measurement)
LFL	Lower flammable limit
LOC	Loss of containment
LSIR	Location-specific individual risk
MMSCFD	Million standard cubic feet per day (gas flow rate)
NFPA	National Fire Protection Association
Proposed Project	the Ventura Compressor Station Modernization Project
psi	Pounds per square inch
PEA	Proponent's Environmental Assessment
PES	Potential explosion site
PHA	Process hazards analysis
QRA	Quantitative risk analysis
SEDC	Supplemental electric-driven compressor installation only
VCAPCD	Ventura County Air Pollution Control District
VCE	Vapor cloud explosion

2.0 QRA RESULTS AND ASSESSMENT

2.1 Location-Specific Individual Risk (LSIR)

Risk results for the Proposed Project, as well as its alternatives, were developed for two scenarios, based on the facility throughputs (details provided in Quest's July 2024 report). The SEDC alternative considered the same two scenarios, plus two additional scenarios, when developing risk results (see Appendix A for further details concerning these operational modes):

- High flow mode (100% compression capacity), assumed to be active 100% of the year;
- "Combined" mode, where high flow, low flow (a reduced compression capacity), and standby (no compression) modes are combined;
- "Operational" mode where an alternate set of high, low, and standby modes is considered; and
- "Electric Only" mode, where the electric compressors are assumed to handle all gas compression and the existing gas-fired units are in a depressurized standby mode.

LSIR contours were constructed for the four scenarios listed above. The LSIR contours in Figure 2-1 illustrate the annual fatality risk from all hazards associated with LOC events for outdoor persons in or near the SEDC alternative for the high flow mode. Figure 2-2 shows the annual fatality risk from all hazards associated with LOC events for outdoor persons in or near the SEDC alternative for the combined modes; Figure 2-3 for the operational mode; and Figure 2-4 for the electric only mode.

Each risk contour shown in Figures 2-1 through 2-4 represents a specific level of risk, where risk is defined by either potentially fatal exposure to any of the hazards associated with the failure cases modeled for this facility. Because the risk contours are based on annual data, this level of risk is dependent on an individual being at the location where a contour is shown for 24 hours a day, 365 days per year. (This applies equally to all presented LSIR contours.) For example, the contours labeled 10^{-5} in the figures (the magenta contours) represent one chance in one hundred thousand per year of being exposed to a fatal hazard due to a flash fire, **OR** jet fire radiation, **OR** a vapor cloud explosion, assuming continuous occupancy at a location where the contour is shown. Any location with individual occupancy less than a full year (i.e., not continuous occupancy) would result in lower risk to persons in that area than is shown in the contours.

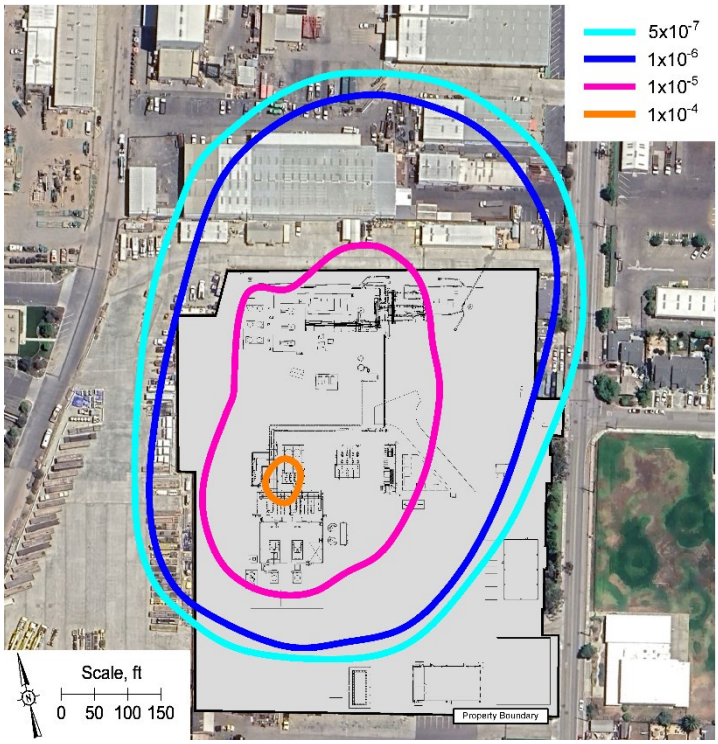

Figure 2-1
Location-Specific Risk for Outdoor Persons – SEDC Alternative, High Flow Mode

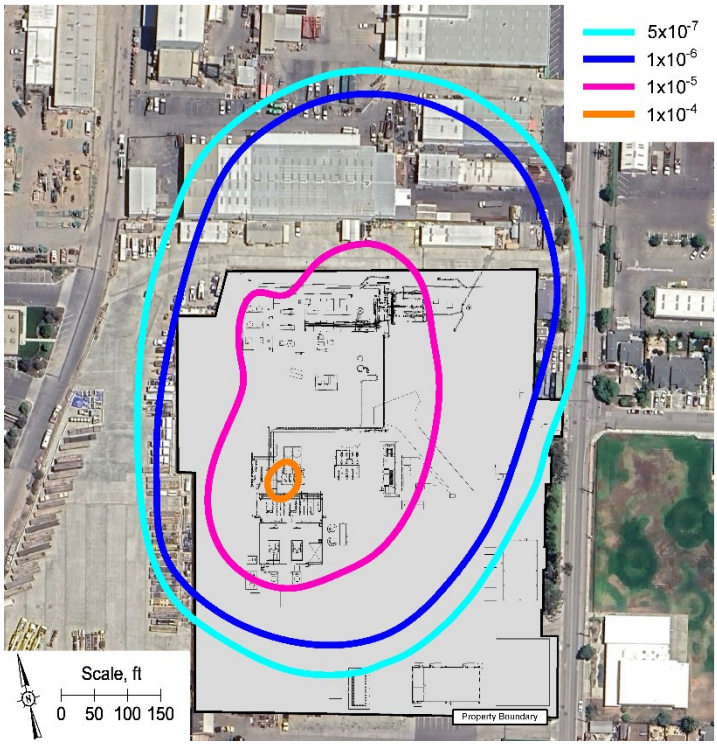

Figure 2-2
Location-Specific Risk for Outdoor Persons – SEDC Alternative, Combined Flow Mode

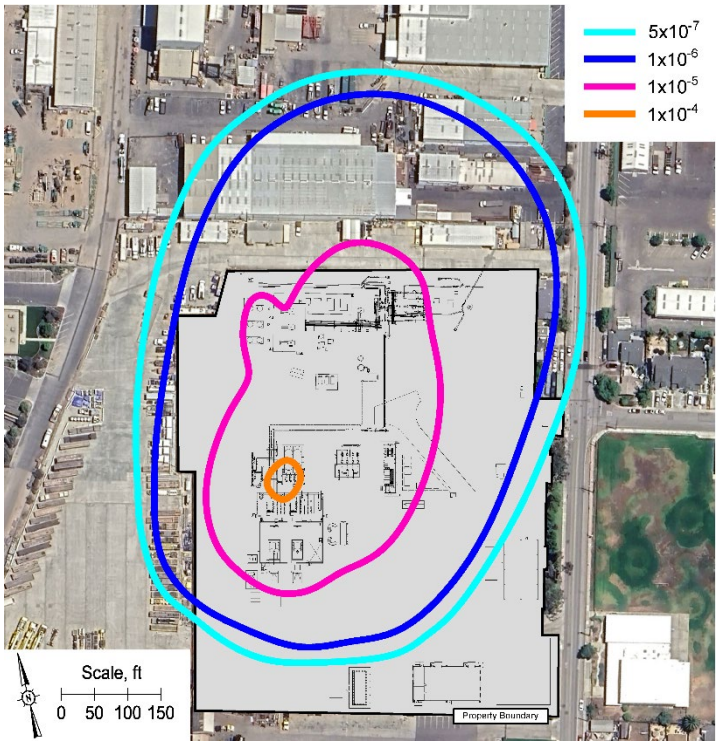

Figure 2-3
Location-Specific Risk for Outdoor Persons – SEDC Alternative, Operational Mode

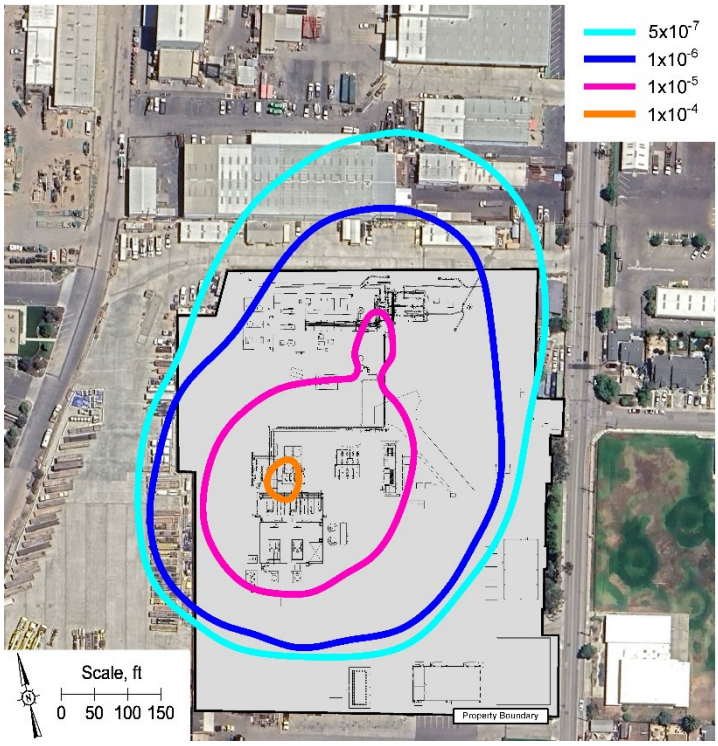

Figure 2-4
Location-Specific Risk for Outdoor Persons – SEDC Alternative, Electric Only Mode

2.2 Exposure to Explosion Overpressure

This QRA study also evaluated the potential for exposure to damaging overpressure following a vapor cloud explosion (which is one component of the hazards evaluated in the QRA). An overpressure level of 1.0 psi, capable of damaging ordinary buildings (and therefore threatening any building occupants) was used as the measure of impact.

Figure 2-5 provides annual risk contours for exposure to 1.0 psi overpressure following vapor cloud explosion events in the compressor station, for the SEDC alternative. As can be seen in Figure 2-5, the risk of experiencing an overpressure of 1.0 psi offsite is less than 1.0×10^{-5} per year, and the 5.0×10^{-7} per year contour extends only into an industrial roadway.

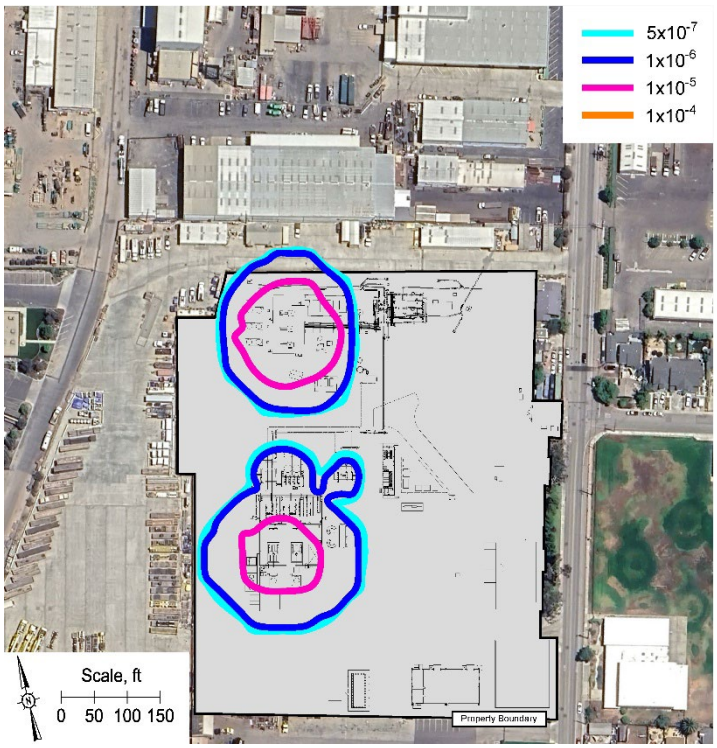

Figure 2-5
SEDC Alternative LSIR –
Exposure to 1.0 psi Overpressure

2.3 Risk Assessment

The results of the risk analysis presented above require some level of professional interpretation, typically called an assessment. The assessment for the SEDC Alternative involves two parts: comparison to the Proposed Project and comparison to various published criteria. A comparison to the Proposed Project (see Quest's July 2024 report) finds the following.

- The risk predicted for the SEDC alternative is similar to that predicted for the existing site, as well as the Proposed Project but does create a larger area of offsite risk than either one when considered individually. This occurs because of the use of the existing gas-fired compressors, while also adding new electric-driven compressor capacity.
- Like the existing site and Proposed Project, risk for the high flow mode was found to be similar to the combined flow mode; a similar risk profile was also found for the operational mode. The electric-only option has a significantly lower risk profile, due to the assumption that the existing gas-driven compressor system is in a blowdown (zero pressure) state.
- Onsite risk on the order of 1.0×10^{-4} per year is created by the new compression equipment.
- Offsite risk is less than 1.0×10^{-4} per year but greater than 1.0×10^{-5} per year is found only in a small area to the north of the site, due to the use of the existing gas compressors.
- Offsite risk between 1.0×10^{-5} per year and 5.0×10^{-7} per year affects a larger area outside the site boundary, both on the north side (gas compressors, similar to the existing compressor station) and west side (similar to but less than the Proposed Project).
- The results of a vapor cloud explosion evaluation, based on 1.0 psi overpressure, show minimal offsite impacts for the SEDC alternative.

It is worth considering that the risk contours in Figures 2-1 through 2-5, when combined with non-continuous occupancy, result in actual risk being less than predicted. Similar to the existing compressor station and the Proposed Project, the SEDC alternative is predicted to create offsite risk greater than 1.0×10^{-5} per year (except for the electric-only mode evaluated in this study), but only in industrial areas. There are no nearby outdoor offsite areas where people would be expected to remain for extended periods of time, nor any residential or commercial use areas within the 5.0×10^{-7} per year risk contour. Thus, risk of potential impacts to persons outside the compressor station, for the SEDC alternative, will be low, similar to that for the existing site and Proposed Project.

When compared to a set of international risk criteria (see Quest's July 2024 QRA report), the result for the SEDC alternative is similar to that assessed for the Proposed project: offsite risk does not exceed the unacceptable risk level for any of the listed criteria.

Lastly, the results of this evaluation are found to be largely consistent with the qualitative evaluation previously provided for the SEDC alternative: when comparing to the Proposed Project, the onsite risk impacts are similar, but the offsite risks are greater. The remaining factors evaluated in the qualitative analysis are factors that could not be evaluated in this QRA study.

3.0 CONCLUSIONS

This study was focused on risk to persons in the vicinity of an alternative natural gas compressor station that would be configured at the existing Ventura Compressor Station site. The risk impacts for the SEDC alternative serve as comparison to the risk predicted for the Proposed Project, where both would be located at the current location operated by SoCalGas.

The QRA study calculated the consequences of (1) jet fires, (2) flash fires, and (3) explosions following accidental releases of natural gas, over a wide range of potential conditions for the SEDC alternative design. The SEDC system has a unique equipment layout when compared to the Proposed Project, but the equipment, its function, and its operating parameters were held, to the extent possible, to be identical to those for the Proposed Project.

The consequences and frequencies of accidental releases from the SEDC system were combined to develop a measure of risk – location specific individual risk (LSIR) – that is used to evaluate the potential impacts to persons in the area. This measure of risk incorporates several conservative assumptions (that will make the predicted risk higher). The main factor among these assumptions is the continuous occupancy assumption that is inherent in the LSIR contours. To the extent that people are not continuously present within and around a compressor station, an individual's actual risk will be lower than predicted in this analysis.

For the SEDC alternative, the onsite and offsite risk were found to be similar to that predicted for the existing site and Proposed Project. The SEDC alternative configuration results in risk greater than 1.0×10^{-5} per year offsite, but only in industrial areas. Vapor cloud explosion analysis found that offsite impacts (as defined by the 1.0 psi overpressure endpoint) were minimal for the SEDC alternative. Lastly, comparison to international risk criteria concludes, as it did for the Proposed Project, that the offsite risk would be acceptable for the SEDC alternative.

APPENDIX A
STUDY BASIS

A-1 Analysis Basis and Assumptions

The information presented in this appendix represents that set of information that departs from the bases and assumptions that were applied in the July 2024 QRA report. To the extent that study variables, methodology, and assumptions do not appear in this report, they can be assumed to be properly represented as presented in the July 2024 report.

A-2 Potential Explosion Sites (PESs)

Locations within and around each alternative site that could provide confinement for flammable vapors or include congestion (repeated small obstacles) are referred to as potential explosion sites, or PESs. As the amount of confinement or degree of obstruction increases, so does the potential strength of the blast wave that could be created by a vapor cloud explosion within that area.

The selection of specific volumes to model as explosion sources is based on the principles outlined in Quest's July 2024 report. The selected PESs for SEDC Alternative site is listed in Table A-1 and demonstrated on each site's plot plan by the orange highlighted zones in Figure A-1.

Table A-1
SEDC Alternative Potential Explosion Sites and Their Modeling Parameters

#	PES Designation	Total PES Volume [ft³]	Average Obstacle Diameter [in]	Number of Confining Planes	Volume Blockage Ratio
1	Existing Gas Metering Area	41,600	4	1	0.030
2	Existing Compressor House	124,000	4	2.5	0.020
3	Existing After Coolers	29,200	4	2	0.030
4	Inlet Filter Area	11,700	4	1.5	0.030
5	Suction/Discharge Header Area	26,600	4	1	0.030
6	Compressor House	175,100	4	2.5	0.020
7	Outlet Coolers	21,000	4	2	0.030
8	Underneath Power Distribution Center	7,800	2	2	0.025

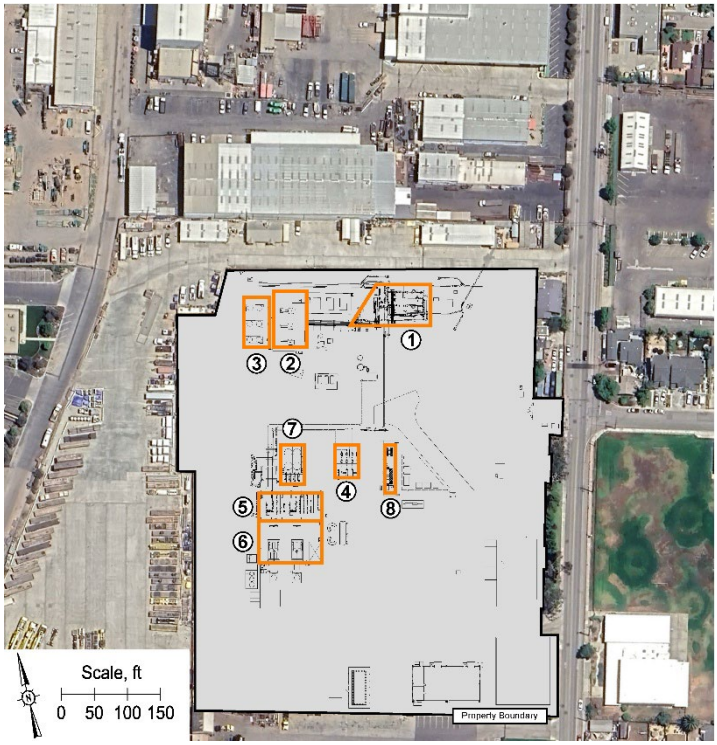

Figure A-1
SEDC Alternative - Potential Explosion Sites

A-3 Delayed Ignition Probability

The delayed ignition probabilities employed in this study are developed according to the methodology presented in the July 2024 QRA report. A delayed ignition map, unique to the proposed SEDC system, for ignition source densities in and around the facility (that could be reached by the flammable cloud), was generated and applied in the QRA calculations.

A-4 Operational Frequencies

When the compressor station is operated in different modes, corresponding to different flow rates based on the number of compressors in operation, frequency data are required. In order to assess the potential risk impacts of operating the station in different modes, four scenarios were evaluated:

- Operating at the full rated flow throughput, 100% of the year (High Flow);
- Operating in "combined" modes: a high flow (full rated flow) mode, low flow mode, and standby mode;
- Operating in "operational" modes: a high flow, low flow; and
- Operating in "electric only" mode: high flow with electric motor compressors and gas motor compressors depressurized (blowdown).

The operating throughputs and frequencies for the four different modes, are provided in Table A-2.

Table A-2
Throughput and Probabilities for Operational Modes

Compressor Set	Operational Mode	Operational Throughput [mmscfd]	Yearly Operational Fraction			
			High Flow Mode	Combined Flow Mode	Operational Flow Mode	Electric Only Mode
Gas	High Flow	70	1.0	0.5	0.1	--
	Standby	0	--	0.5	0.90	--
	Blowdown	0	--	--	--	1.0
Electric	High Flow	90	1.0	0.5	0.75	1.0
	Low Flow	50	--	0.25	--	--
	Standby	0		0.25	0.25	--

APPENDIX B
FULL-SCALE GRAPHICS

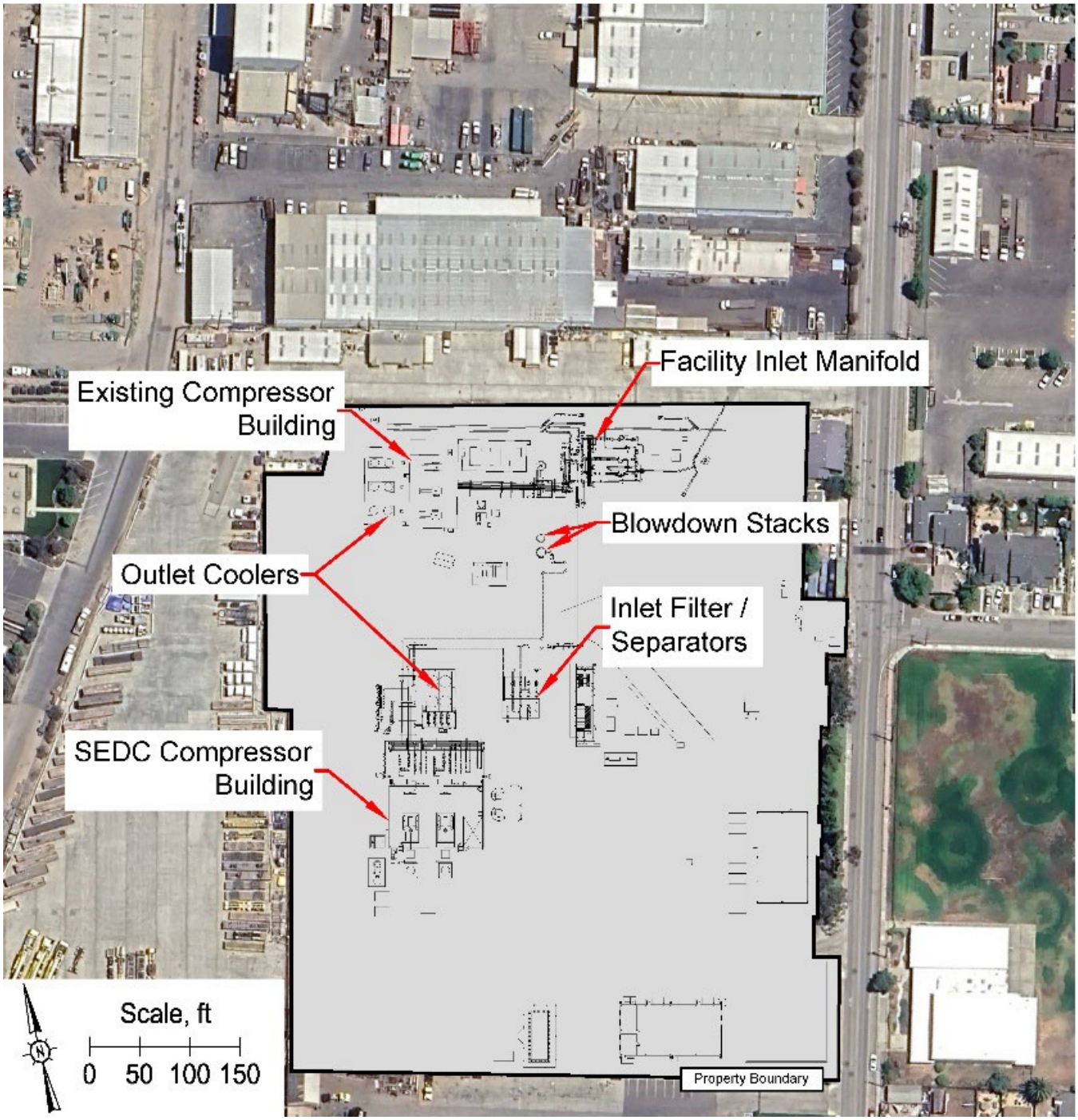

Figure B-1
Layout of the SEDC Alternative

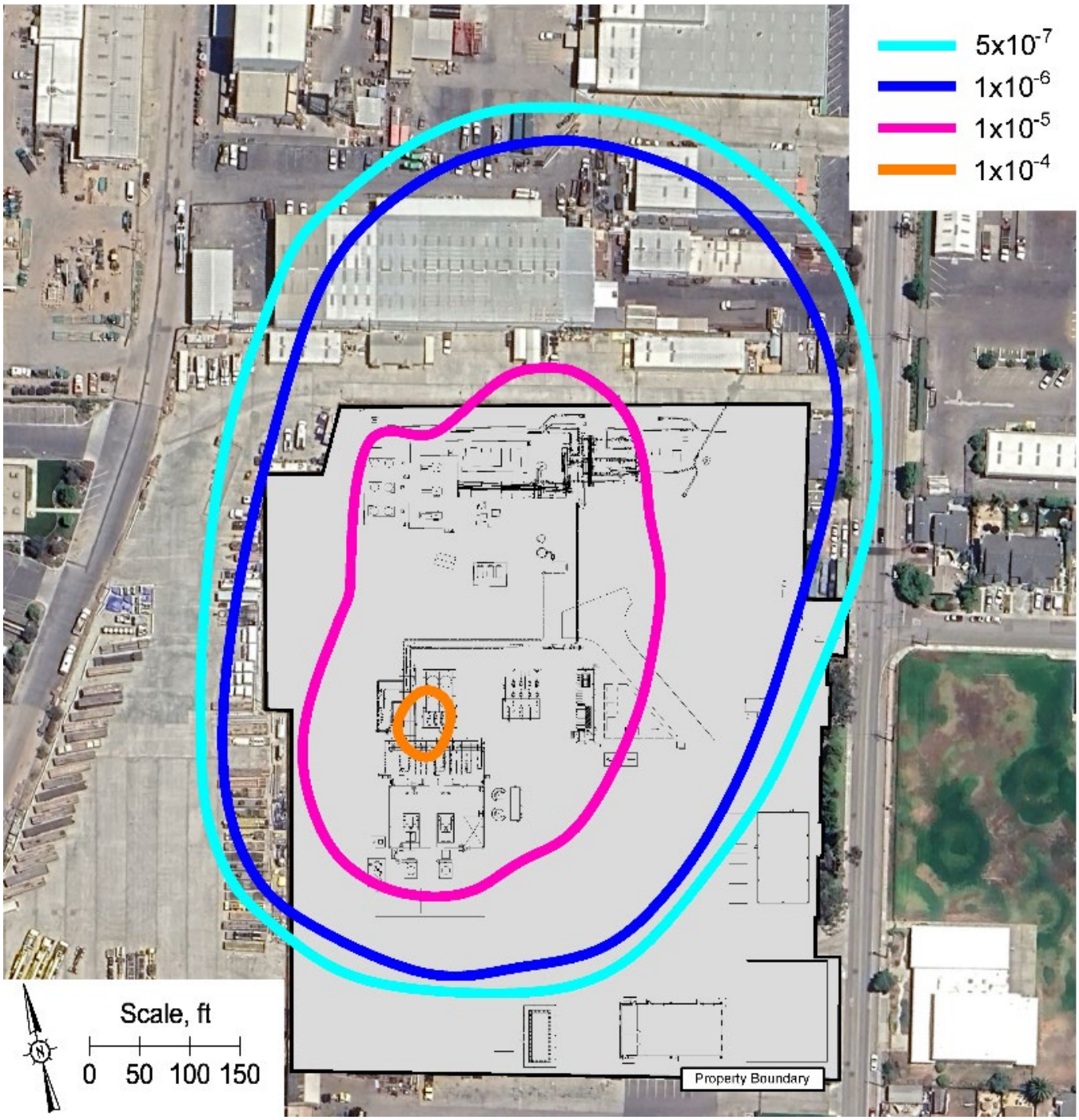

Figure B-2
Location-Specific Risk for Outdoor Persons – SEDC Alternative, High Flow Mode

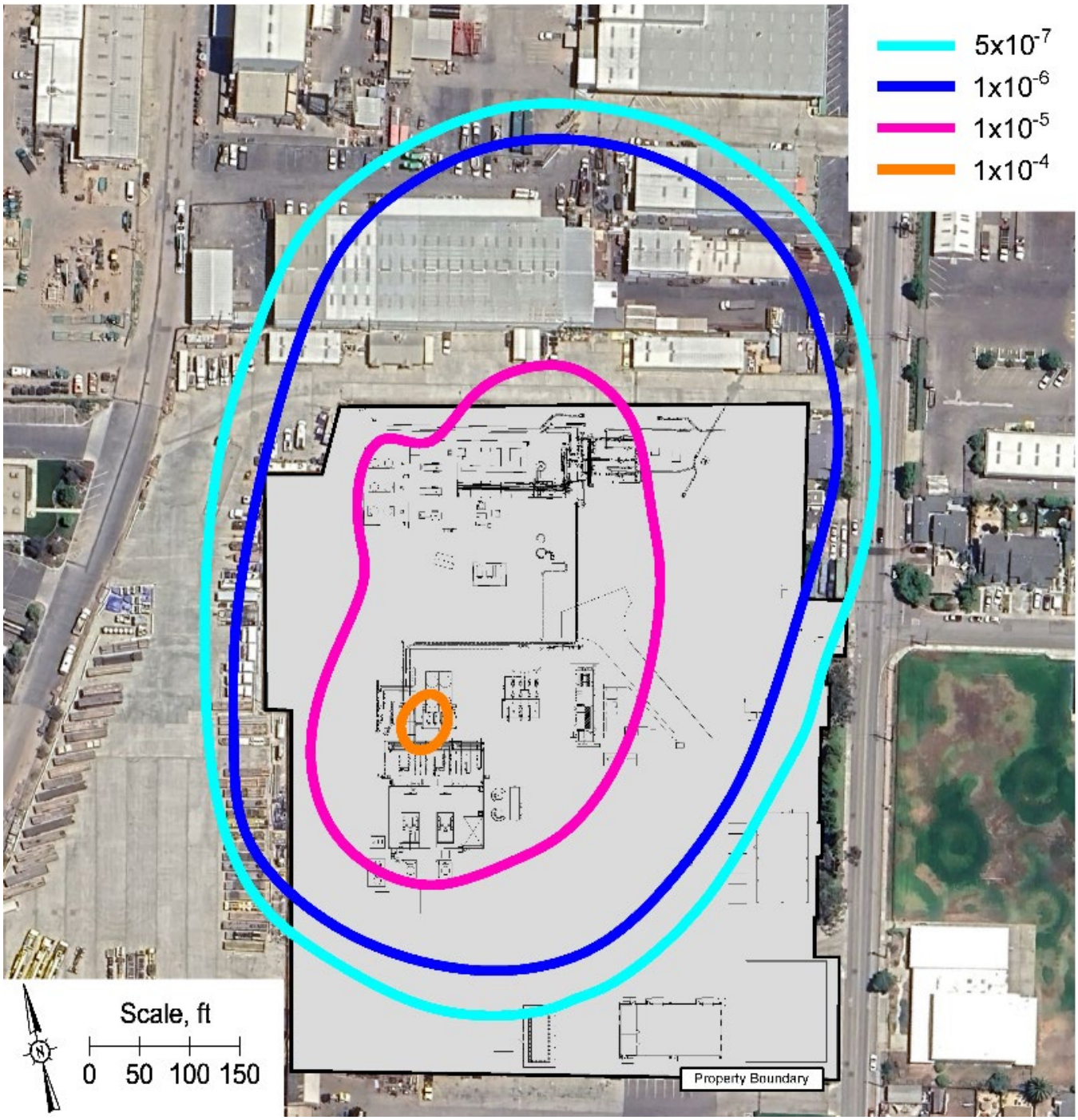

Figure B-3
Location-Specific Risk for Outdoor Persons – SEDC Alternative, Combined Flow Mode

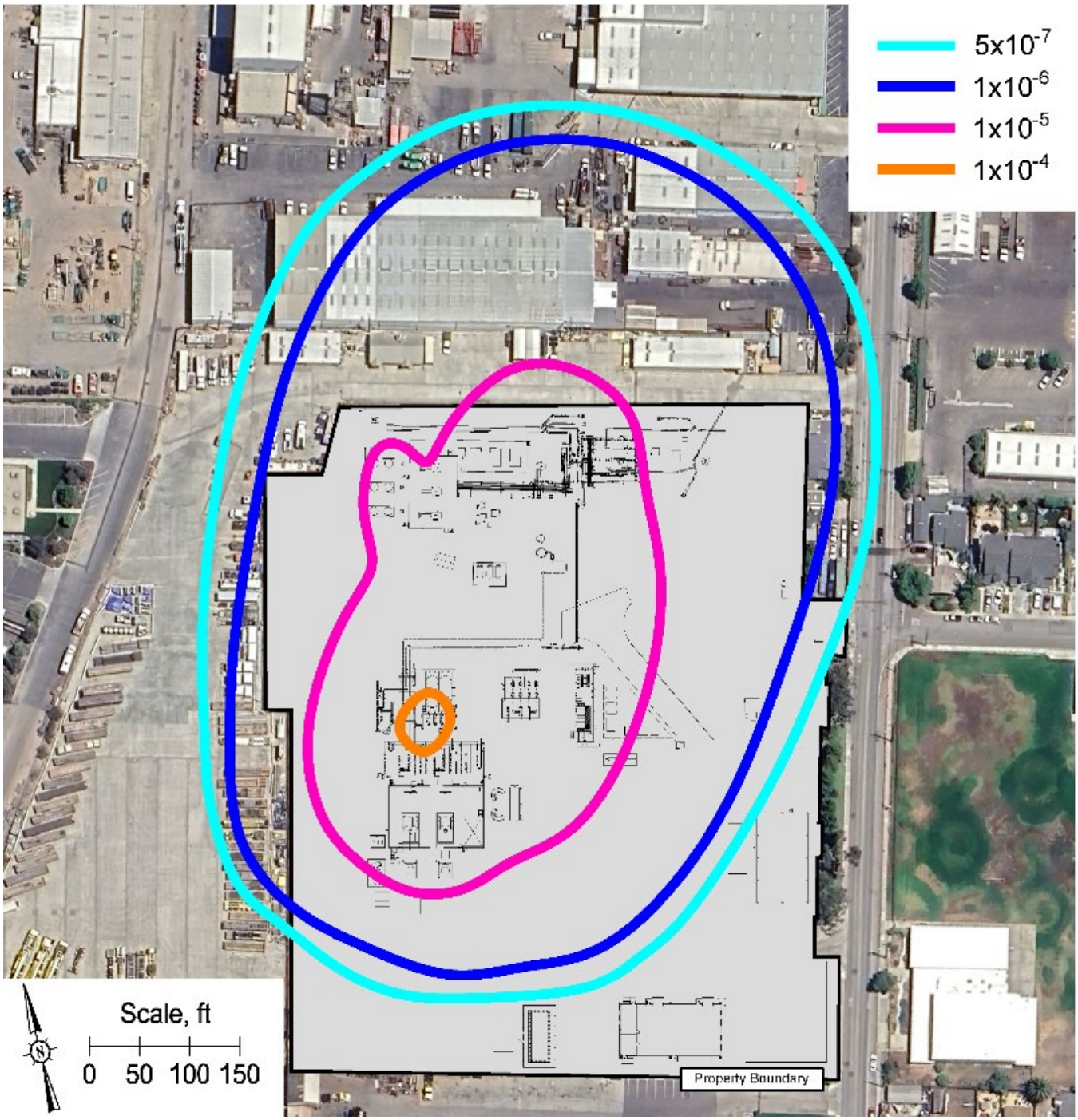

Figure B-4
Location-Specific Risk for Outdoor Persons – SEDC Alternative, Operational Mode

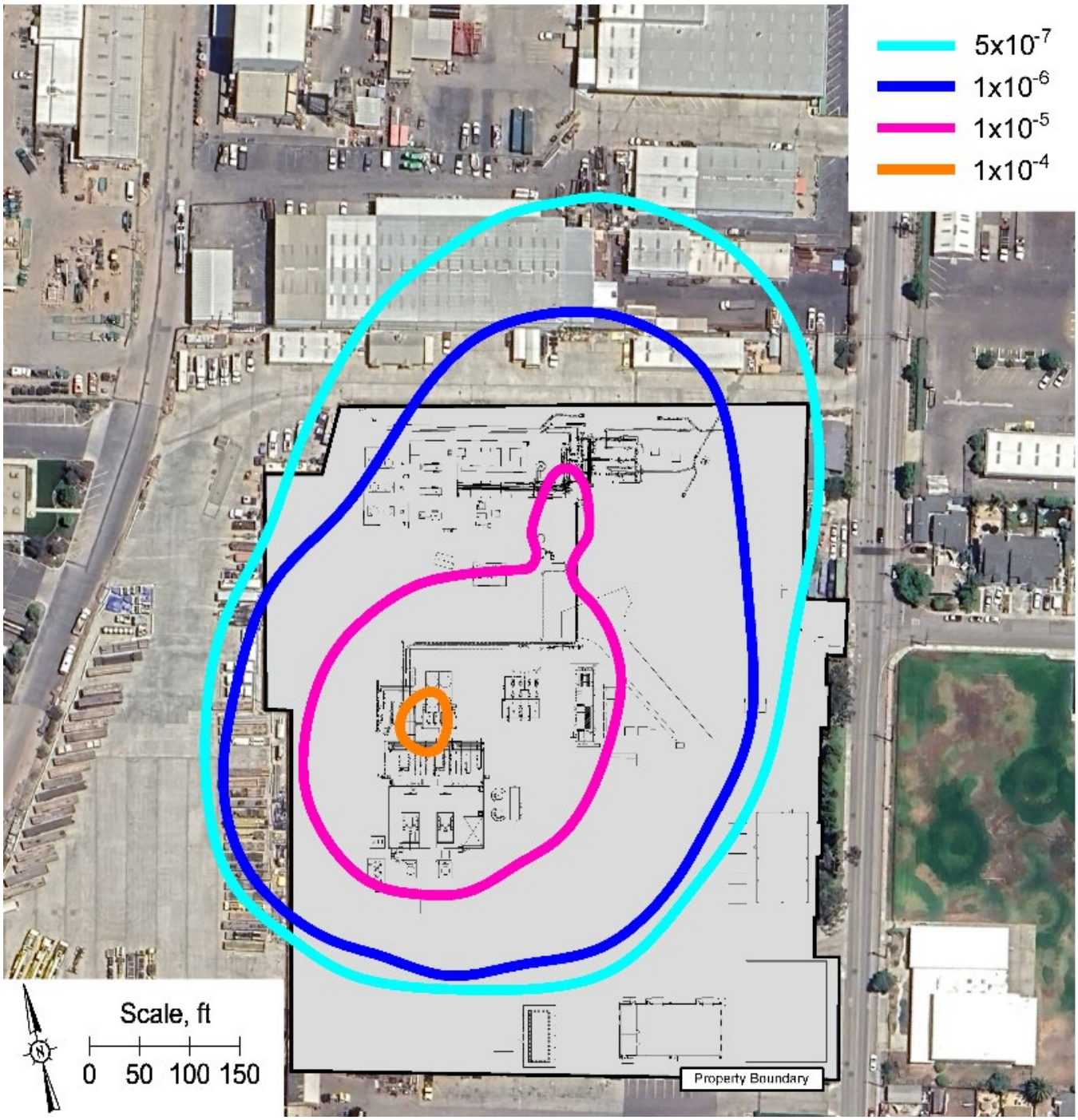

Figure B-5
Location-Specific Risk for Outdoor Persons – SEDC Alternative, Electric Only Mode

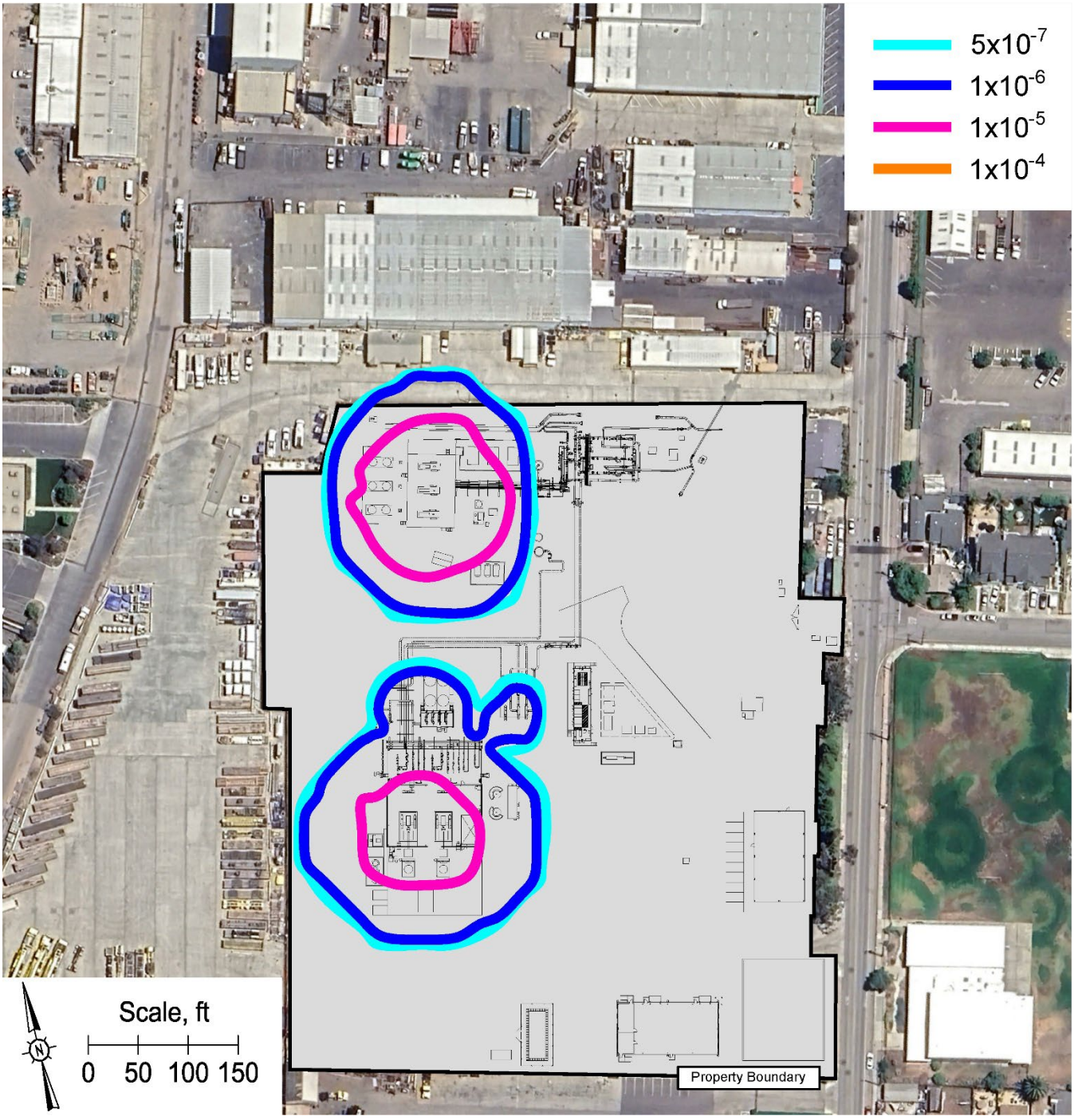

Figure B-6
SEDC Alternative LSIR – Exposure to 1.0 psi Overpressure

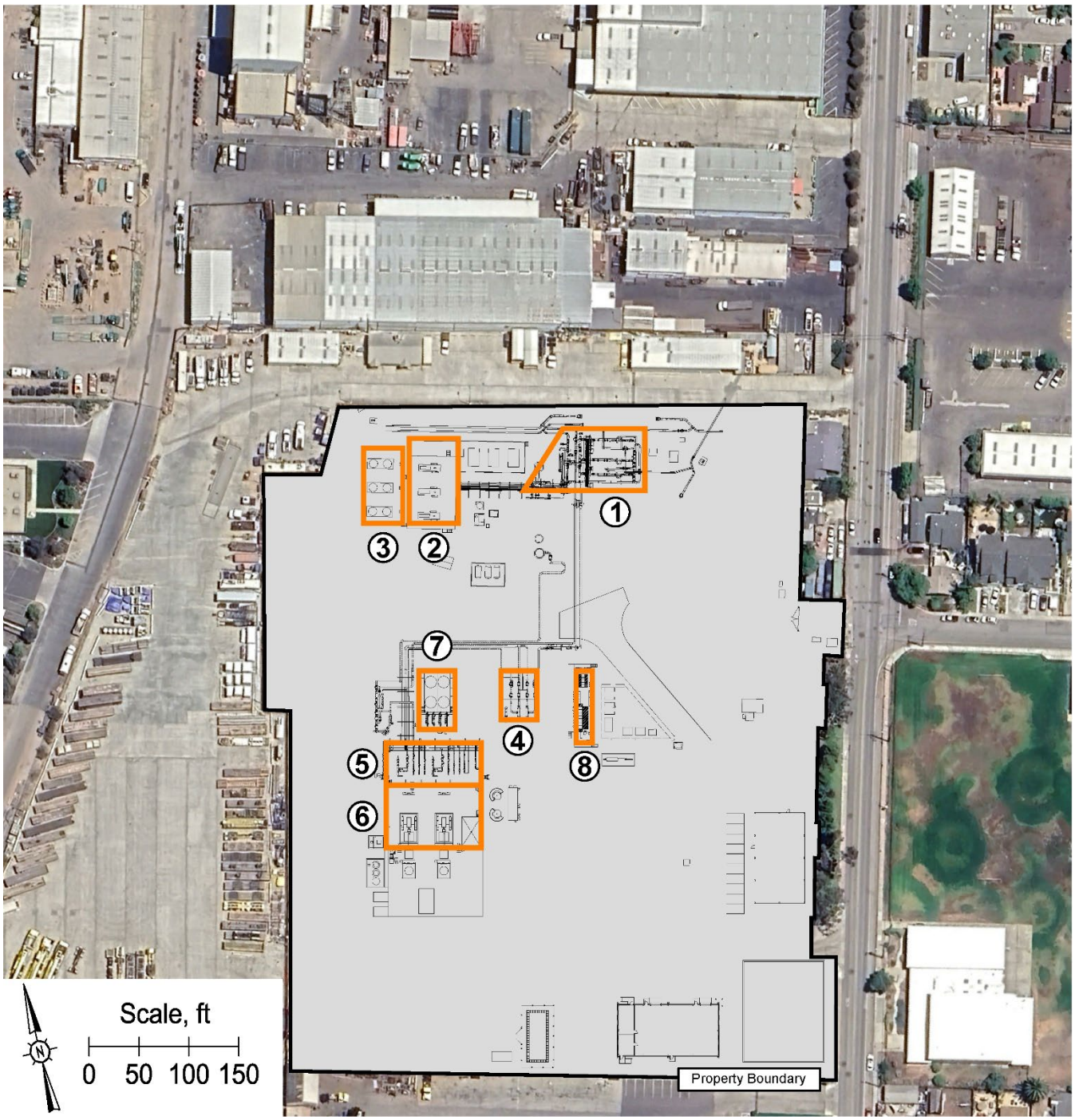

Figure B-7
SEDC Alternative - Potential Explosion Sites

APPENDIX C
FAILURE CASE INITIAL CONDITIONS

The failure cases and their initial conditions considered in the SEDC alternative analysis are denoted by cases from the existing Ventura Compressor Station (EXE) and those from the supplemental electric-driven compressors (EDC). The full list of failure cases is provided in Table C-1. The failure cases are specific to the supplemental electric-driven compressor installation only (SEDC) alternative to the Proposed Project.

Table C-1
Failure Case Conditions

Failure Case Designation	Release from	Pipe size [inches]	Initial Conditions		
			Temperature [°F]	Pressure [psia]	Operational Mode
EXE01	Compression Station Inlet	12	72.6	510	High Flow
EXE02	Compression Inlet Header	12	72.6	510	High Flow
EXE03	Single Compressor Inlet	6	72.6	510	High Flow
EXE04	Single Compressor Discharge	6	190	1016	High Flow
EXE05	Gas Cooler	6	115	1016	High Flow
EXE06	Cooled Gas Discharge Header	12	115	1015	High Flow
EXE07	Compression Station Outlet	12	115	1015	High Flow
EXE08	Fuel Gas Supply	2	48.3	95	High Flow
EXE09	Fuel Gas Feed to Compressors	2	48.3	95	High Flow
EXE22	Compression Inlet Header	12	72.6	510	Standby
EXE23	Single Compressor Inlet	6	72.6	510	Standby
EXE24	Single Compressor Discharge	6	190	1016	Standby
EXE25	Gas Cooler	6	115	1016	Standby
EXE26	Cooled Gas Discharge Header	12	115	1015	Standby
EXE27	Compression Station Outlet	12	115	1015	Standby
EXE28	Fuel Gas Supply	2	48.3	95	Standby
EXE29	Fuel Gas Feed to Compressors	2	48.3	95	Standby

Failure Case Designation	Release from	Pipe size [inches]	Initial Conditions		
			Temperature [°F]	Pressure [psia]	Operational Mode
EDC01	Compression Station Inlet - Buried	20	79.75	465	High Flow
EDC02	Compression Inlet Header	16	79.75	465	High Flow
EDC03	Single Compressor Feed	16	79.75	465	High Flow
EDC04	Single Compressor Inlet	16	79.75	465	High Flow
EDC05	Single Compressor Discharge	8	208.17	1015	High Flow
EDC06	Compressor Discharge Header	16	208.17	1015	High Flow
EDC07	Cooled Gas to Station Outlet	16	104.78	1005	High Flow
EDC08	Compression Station Outlet - Buried	22	104.78	1005	High Flow
EDC11	Compression Station Inlet - Buried	20	79.75	465	Low Flow
EDC12	Compression Inlet Header	16	79.75	465	Low Flow
EDC13	Single Compressor Feed	16	79.75	465	Low Flow
EDC14	Single Compressor Inlet	16	79.75	465	Low Flow
EDC15	Single Compressor Discharge	8	208.17	1015	Low Flow
EDC16	Compressor Discharge Header	16	208.17	1015	Low Flow
EDC17	Cooled Gas to Station Outlet	16	104.78	1005	Low Flow
EDC18	Compression Station Outlet - Buried	22	104.78	1005	Low Flow
EDC21	Compression Station Inlet - Buried	20	79.75	465	Standby
EDC22	Compression Inlet Header	16	79.75	465	Standby
EDC23	Single Compressor Feed	16	79.75	465	Standby
EDC24	Single Compressor Inlet	16	79.75	465	Standby
EDC25	Single Compressor Discharge	8	208.17	1015	Standby
EDC26	Compressor Discharge Header	16	208.17	1015	Standby
EDC27	Cooled Gas to Station Outlet	16	104.78	1005	Standby
EDC28	Compression Station Outlet - Buried	22	104.78	1005	Standby

APPENDIX D
HAZARD EXTENTS

The various hazards extents associated with accidental releases of natural gas from the SEDC alternative are provided for the existing gas-driven compressors (EXE) and the supplemental electric-driven compressors (EDC). Table D-1 shows the maximum downwind extents of the various failure case scenarios for lower flammable limit (LFL) and thermal radiation impacts. These are based on the fatality endpoints for outdoor persons. Table D-2 presents the explosion overpressure impacts for each of the potential explosion sites (PESs) chosen for this analysis.

Table D-1
Maximum Distances [feet] to Lethal Hazard Levels

Failure Case Designation	Release from	Lower Flammable Limit (LFL)	Thermal Radiation		
			28.4 kW/m²	14.3 kW/m²	7.3 kW/m²
EXE01	Compression Station Inlet	180	325	340	380
EXE02	Compression Inlet Header	<10	<10	<10	<10
EXE03	Single Compressor Inlet	<10	<10	<10	<10
EXE04	Single Compressor Discharge	<10	<10	<10	<10
EXE05	Gas Cooler	45	85	95	105
EXE06	Cooled Gas Discharge Header	<10	<10	<10	<10
EXE07	Compression Station Outlet	280	570	575	625
EXE08	Fuel Gas Supply	10	15	15	20
EXE09	Fuel Gas Feed to Compressors	<10	<10	<10	<10
EXE22	Compression Inlet Header	<10	<10	<10	<10
EXE23	Single Compressor Inlet	<10	<10	<10	<10
EXE24	Single Compressor Discharge	<10	<10	<10	<10
EXE25	Gas Cooler	80	40	40	40
EXE26	Cooled Gas Discharge Header	<10	<10	<10	<10
EXE27	Compression Station Outlet	280	570	575	625
EXE28	Fuel Gas Supply	10	<10	<10	<10
EXE29	Fuel Gas Feed to Compressors	<10	<10	<10	<10

Failure Case Designation	Release from	Lower Flammable Limit (LFL)	Thermal Radiation		
			28.4 kW/m²	14.3 kW/m²	7.3 kW/m²
EDC01	Compression Station Inlet - Buried	15	270	330	395
EDC02	Compression Inlet Header	120	235	235	265
EDC03	Single Compressor Feed	110	220	225	245
EDC04	Single Compressor Inlet	<10	<10	<10	<10
EDC05	Single Compressor Discharge	<10	<10	<10	<10
EDC06	Compressor Discharge Header	80	180	180	195
EDC07	Cooled Gas to Station Outlet	100	185	185	205
EDC08	Compression Station Outlet - Buried	20	465	540	615
EDC11	Compression Station Inlet - Buried	15	280	340	400
EDC12	Compression Inlet Header	135	255	260	295
EDC13	Single Compressor Feed	100	195	195	220
EDC14	Single Compressor Inlet	<10	<10	<10	<10
EDC15	Single Compressor Discharge	<10	<10	<10	<10
EDC16	Compressor Discharge Header	75	135	140	160
EDC17	Cooled Gas to Station Outlet	90	140	150	175
EDC18	Compression Station Outlet - Buried	20	465	540	615
EDC21	Compression Station Inlet - Buried	15	280	340	405
EDC22	Compression Inlet Header	135	260	260	295
EDC23	Single Compressor Feed	120	170	175	180
EDC24	Single Compressor Inlet	<10	<10	<10	<10
EDC25	Single Compressor Discharge	<10	<10	<10	<10
EDC26	Compressor Discharge Header	145	75	75	85
EDC27	Cooled Gas to Station Outlet	175	100	100	110
EDC28	Compression Station Outlet - Buried	20	465	540	615

Table D-2
Maximum Overpressure Impacts [feet] Associated with the SEDC Alternative

#	PES Designation	72.0 psi	13.1 psi	2.4 psi
1	Existing Gas Metering Area	†	†	†
2	Existing Compressor House	†	†	†
3	Existing After Coolers	†	†	†
4	Inlet Filter Area	†	†	†
5	Suction/Discharge Header Area	†	†	†
6	Compressor House	†	†	†
7	Outlet Coolers	†	†	†
8	Underneath Power Distribution Center	†	†	†

† - Overpressure endpoint not reached