



Successful Large-Scale Vapor Intrusion Investigation March 3, 2021



23rd California Unified Program Annual
Training Conference
February 2 – March 18, 2021

Presentation Outline

- Key components for successful investigation
- Key principles from the draft supplemental guidance
- Project history
- Vapor intrusion investigation with the key components and draft supplemental guidance



Key Components for Successful Investigation

- Collaborative Communication
 - Consistent and effective communication with the RP and their consultant.
 - Public outreach and providing multiple outlets for additional information.
- Adaptive Approach
 - Accepting and incorporating feedback.
 - Willingness to “course correct” along the way as appropriate.
- Transparency

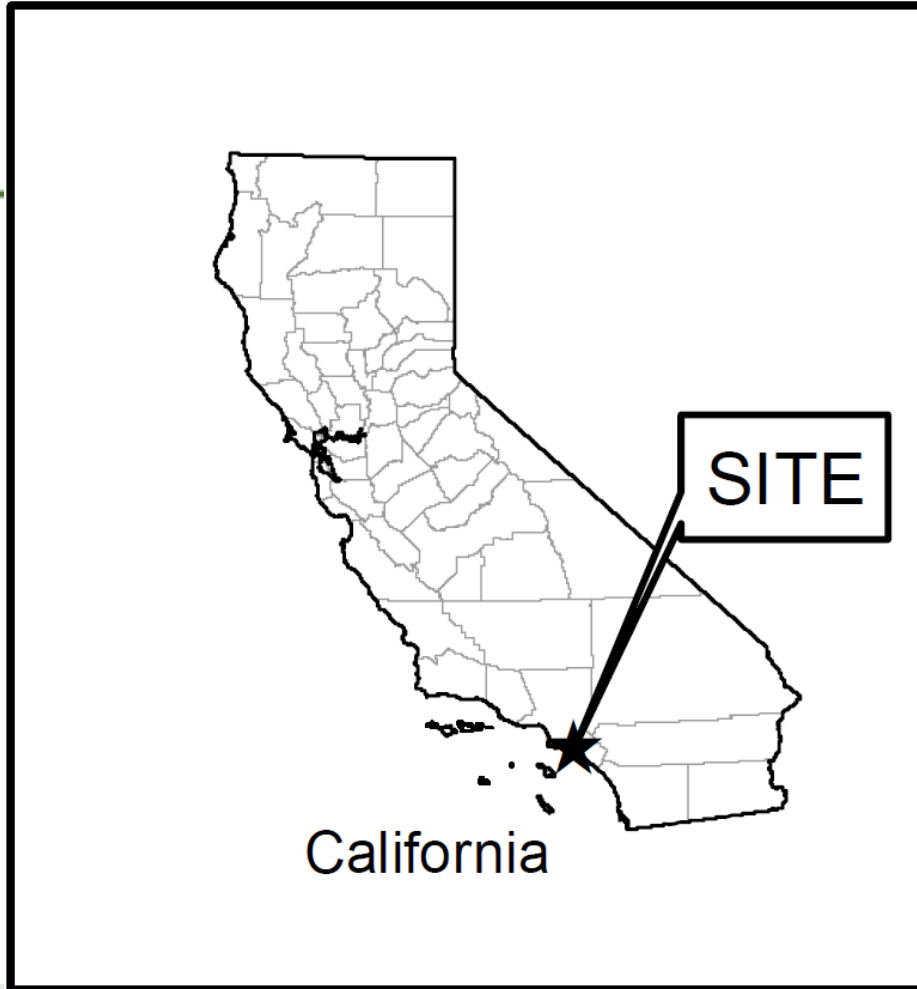


Draft Supplemental Vapor Intrusion Guidance

➤ Key Principles

- Step 1 - Prioritize buildings and select sampling approach for vapor intrusion evaluation
- Step 2 - Evaluate vapor intrusion risk using soil gas data
- Step 3 - Design the Indoor air investigation accordingly
- Step 4 - Current and future risk evaluation and management decisions



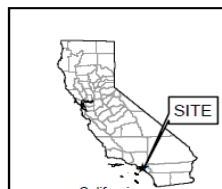


California

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Site Location Map



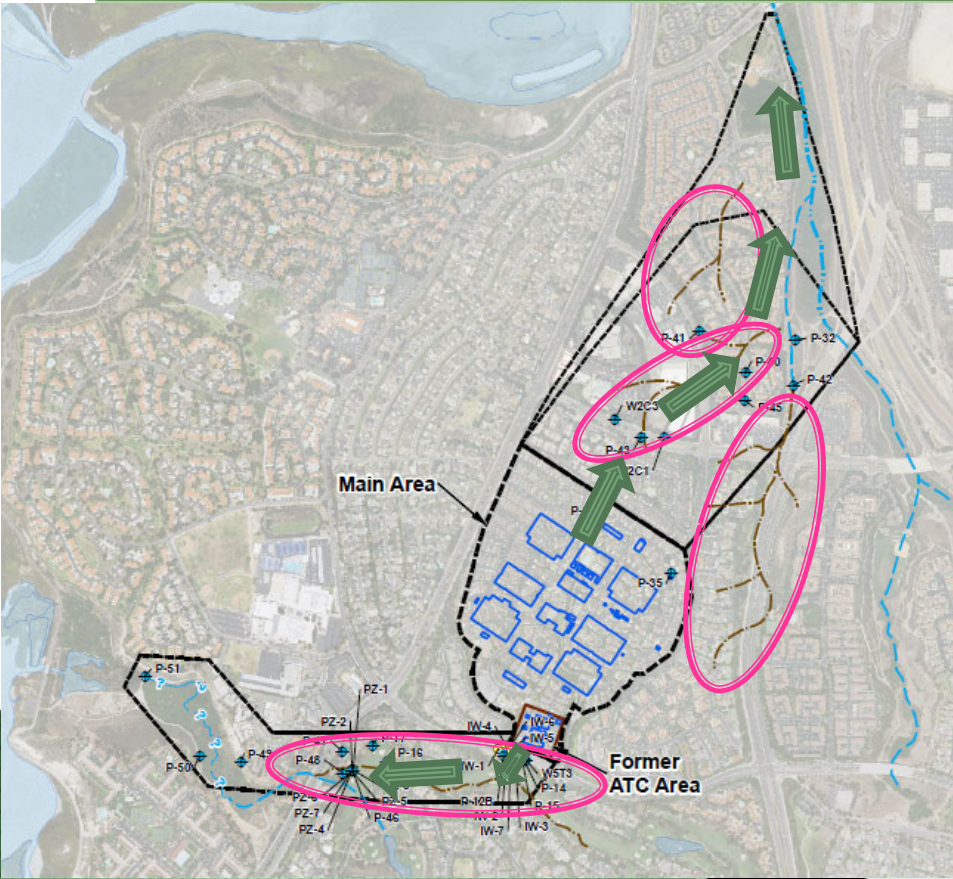
0 2 4 Miles



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Site Vicinity Map



- Explanation
- Monitoring well or piezometer
 - Former IRZ injection piezometer
 - Creek (current)
 - Creek (former)
 - Creek dashed with queries where inferred
 - Former Arroyo (1931 USGS topographic map)
 - Former facility boundary
 - Approximate investigation areas
 - Location of former facility buildings
 - Former ATC area
 - Water Features
 - GW flow direction

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Key Dates

- 1996-1997: Site received soil closure from the local oversight program (LOP), allowing the property to be re-zoned for residential use. Offsite groundwater assessment required.
- 1998: Former facility redeveloped with residential homes.
- 2001-2004: Remediation in the BCA Area



Key Dates cont.

- 2006, 2008, & 2012: Limited soil gas assessment conducted, concluded health risks were not present.
- 2014 USEPA Memo re: acute TCE exposure
- 2016 SF Bay Region updated ESLs
- 2017: Conceptual Site Model (CSM) submitted
 - Data gaps in the CSM triggered the current vapor intrusion assessment
- 2018: Vapor intrusion assessment began

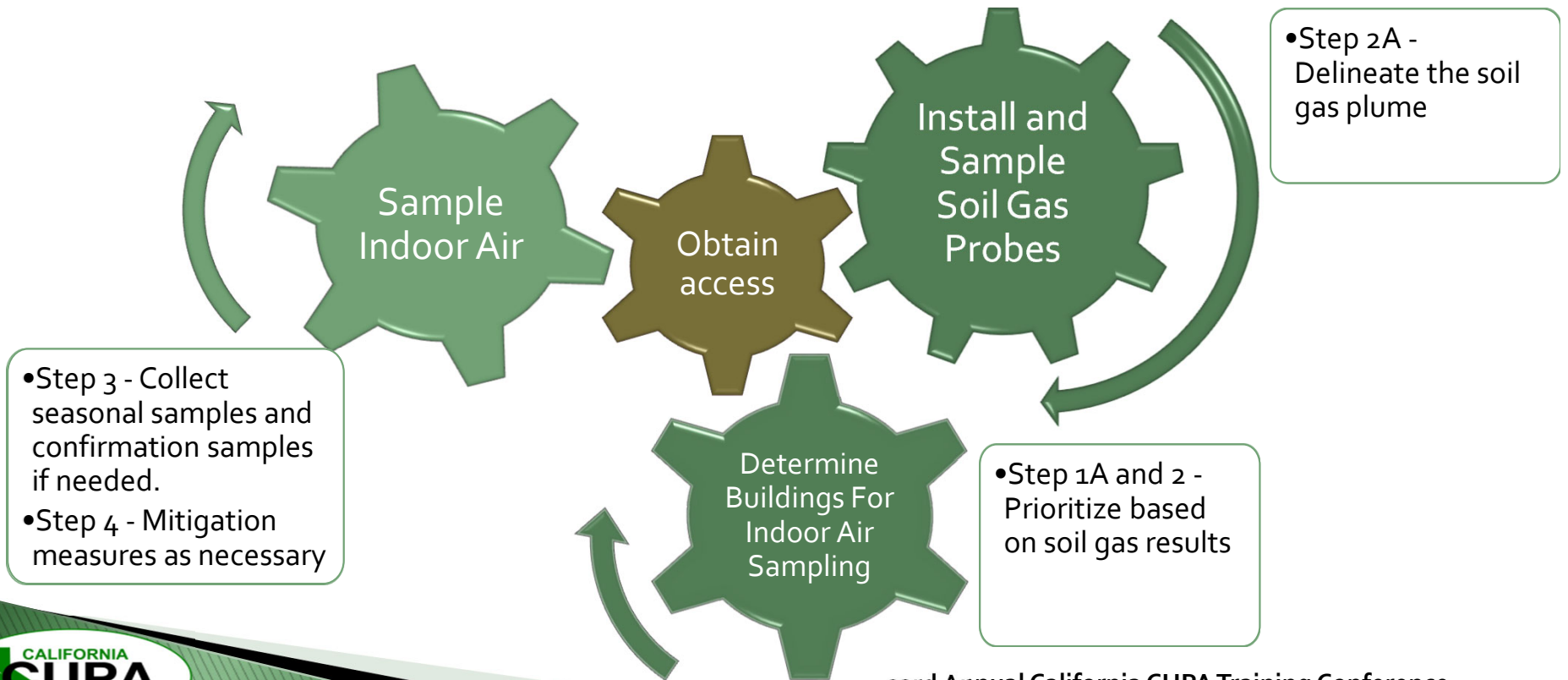


Vapor Intrusion Investigation

- January 2018: Initial Soil Gas Work Plan Approved
 - 14 soil gas probes installed in May 2018 and sampled June 2018
- July 2018: Indoor Air Sampling Work Plan Approved
 - Included a decision flow chart which established a clear path forward for the entire vapor intrusion investigation

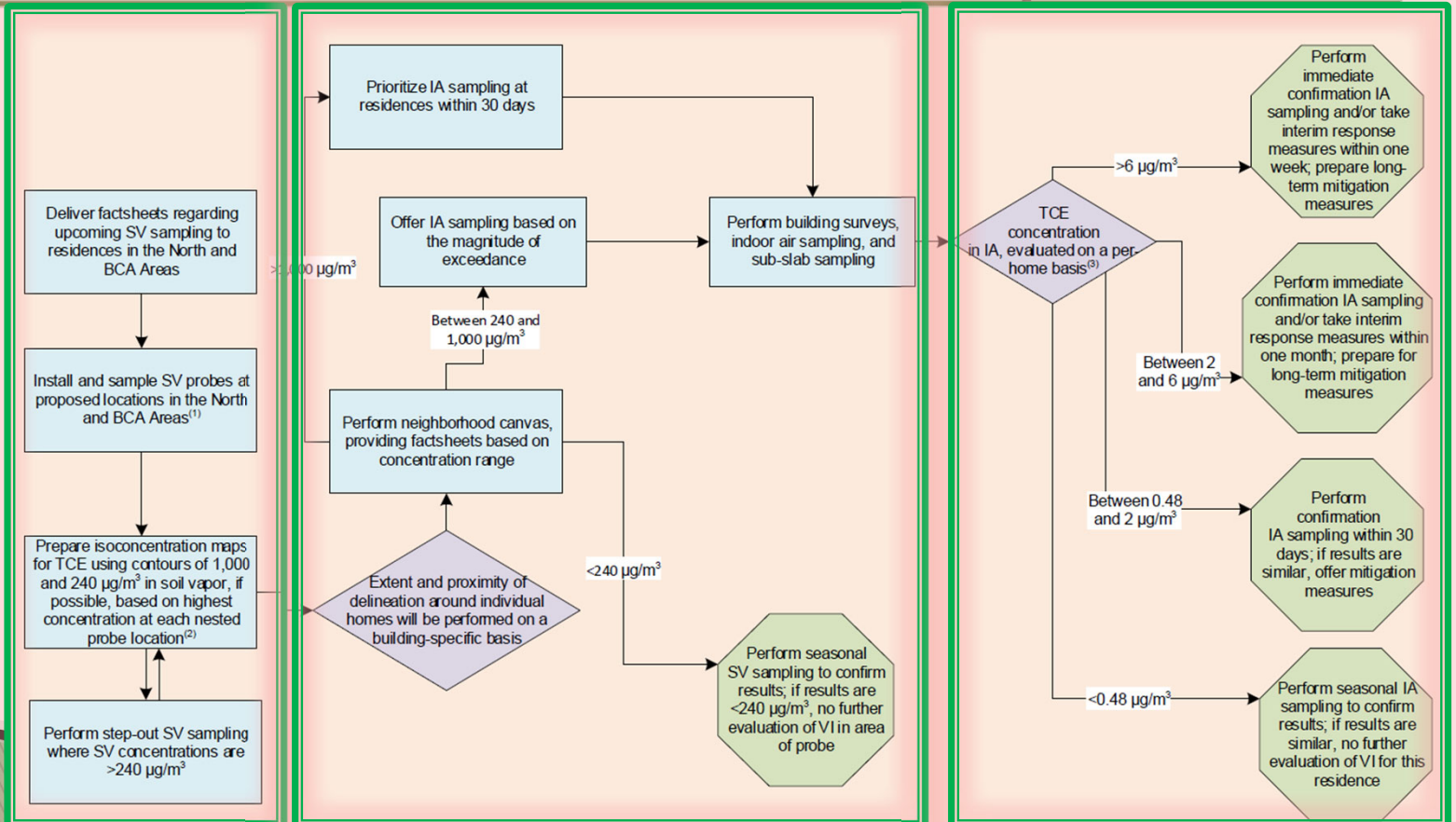


Decision Flow Chart for Vapor Intrusion Assessment



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Decision Flow Chart for Vapor Intrusion Assessment at Residential Properties



Vapor Intrusion Investigation

- Soil gas samples collected from 5 and 15 feet bgs and analyzed for all VOCs.
- Indoor air samples collected over 24 hours from various rooms and analyzed for select VOCs.
- Work being conducted in accordance with current VI guidance documents as well as draft supplemental VI guidance.



Vapor Intrusion Investigation – Project Totals

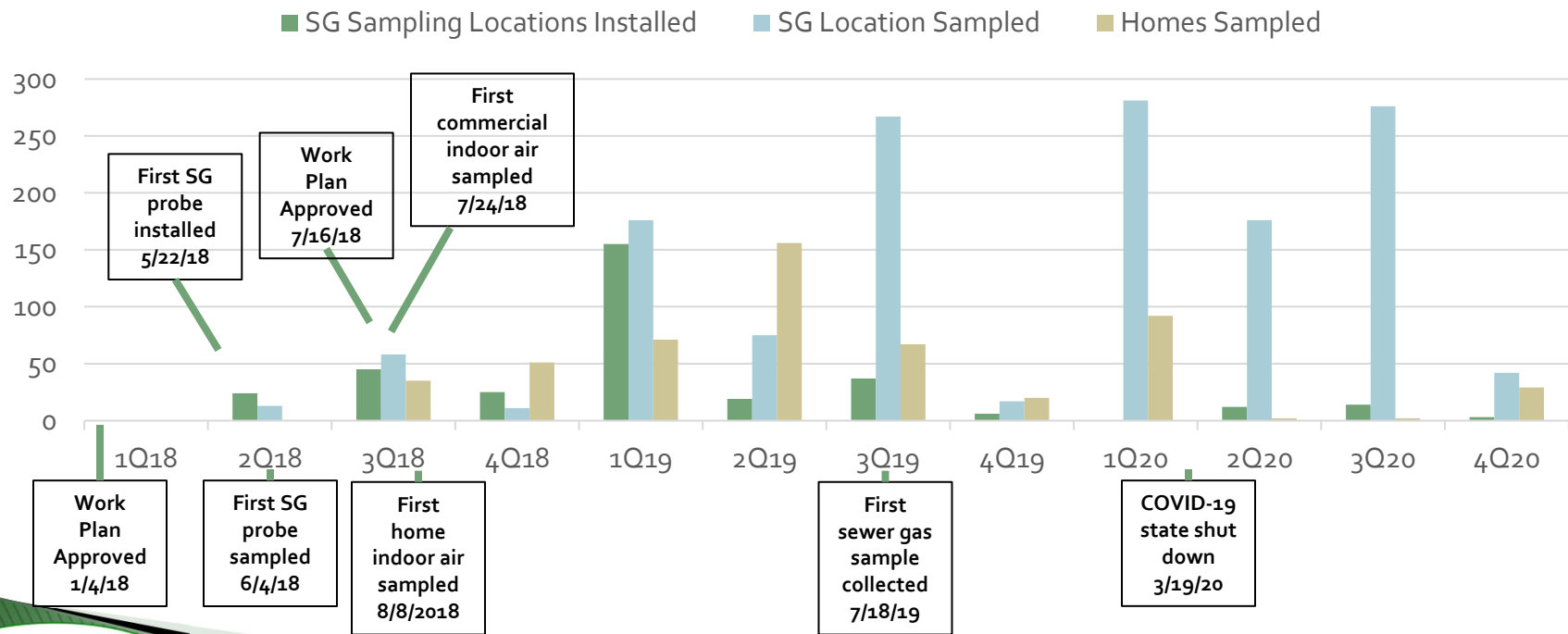
Investigation Summaries from January 1, 2018 through December 31, 2020

| | |
|------|---|
| 549 | Number of homes offered indoor air sampling |
| 327 | Number of homes with executed access agreements |
| 300 | Number of homes sampled at least one time |
| 3 | Number of commercial properties sampled at least one time |
| 337 | Number of soil gas sampling locations installed |
| 3036 | Number of soil gas samples collected (includes dups and reps) |



Vapor Intrusion Investigation

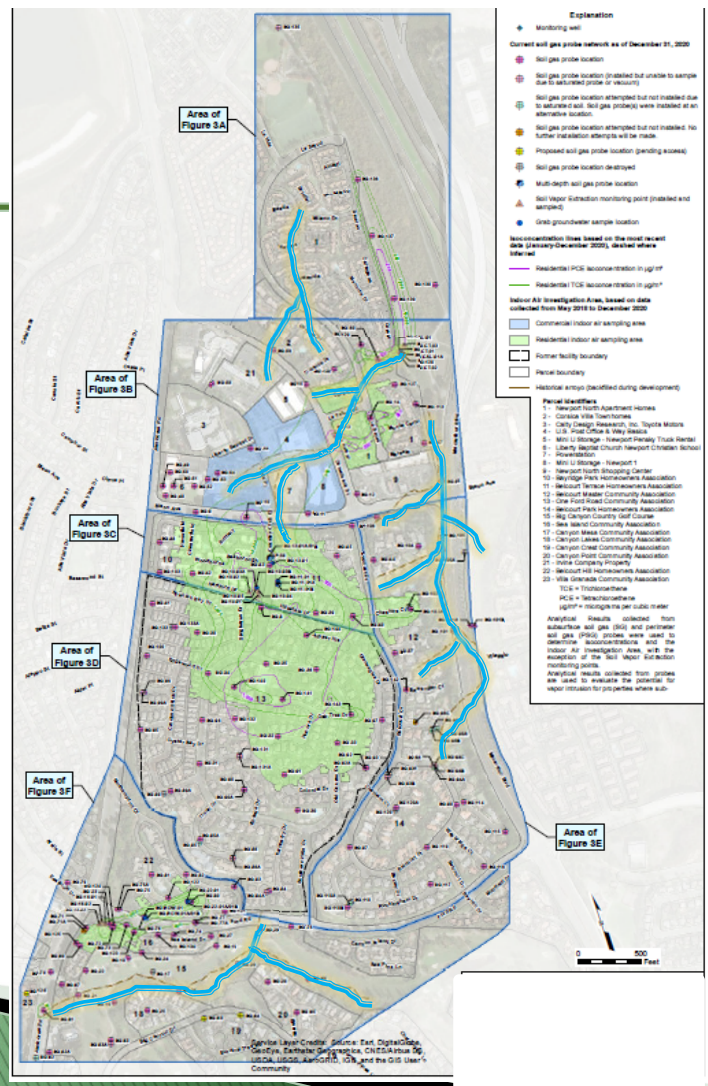
Vapor Intrusion Investigation Timeline



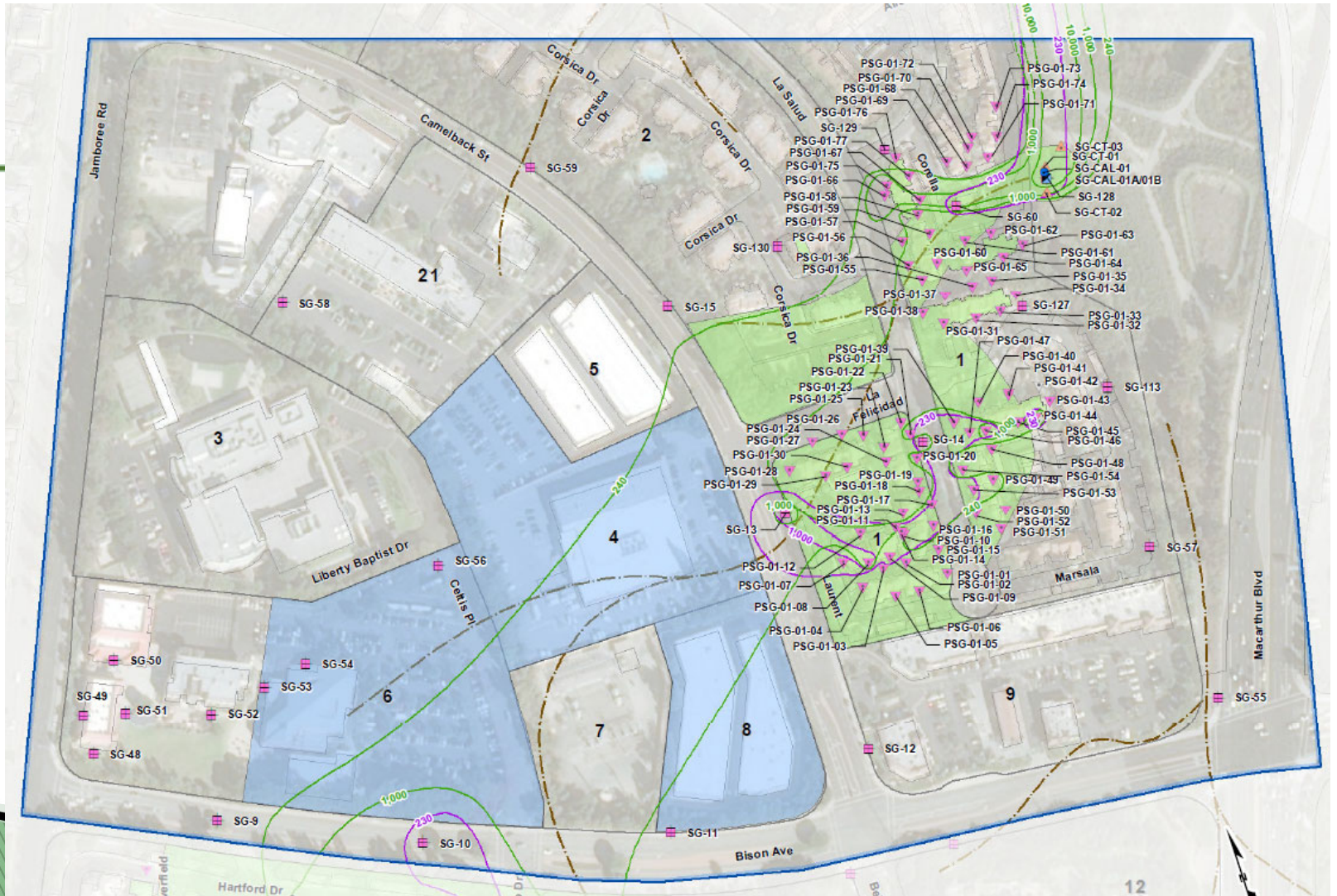
Environmental Screening Levels (ESLs)

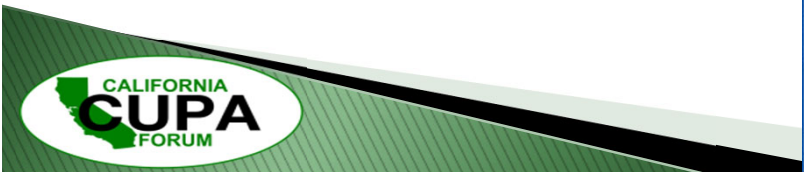
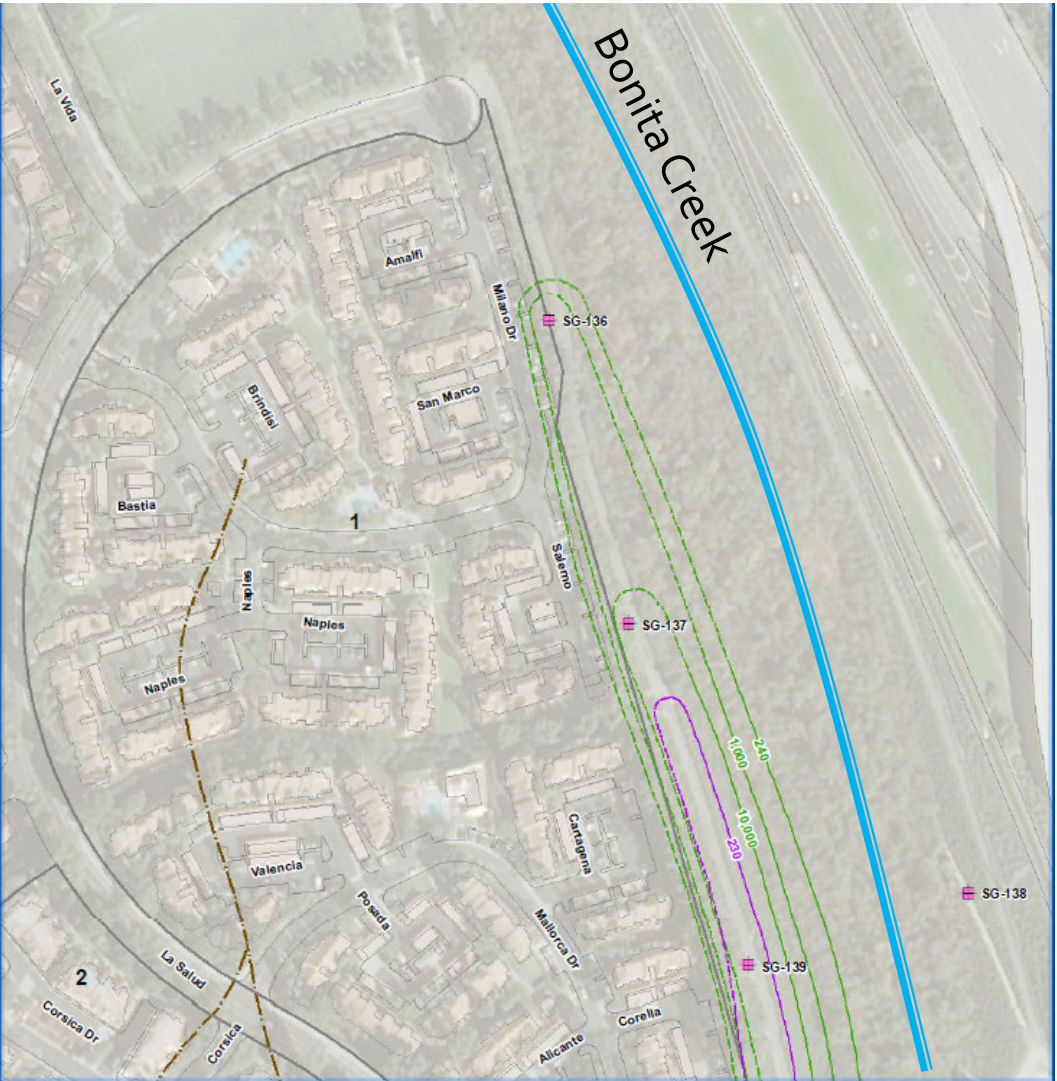
- Investigation began in June 2018.
- ESLs updated January 24, 2019.
 - Indoor air screening levels stayed the same.
 - Primary updates to soil gas screening levels.
 - Based on the current U.S. EPA default attenuation factors.
- 2016 vs. 2019 ESLs?
- Same approach
- Changes TBD based on analytical data.

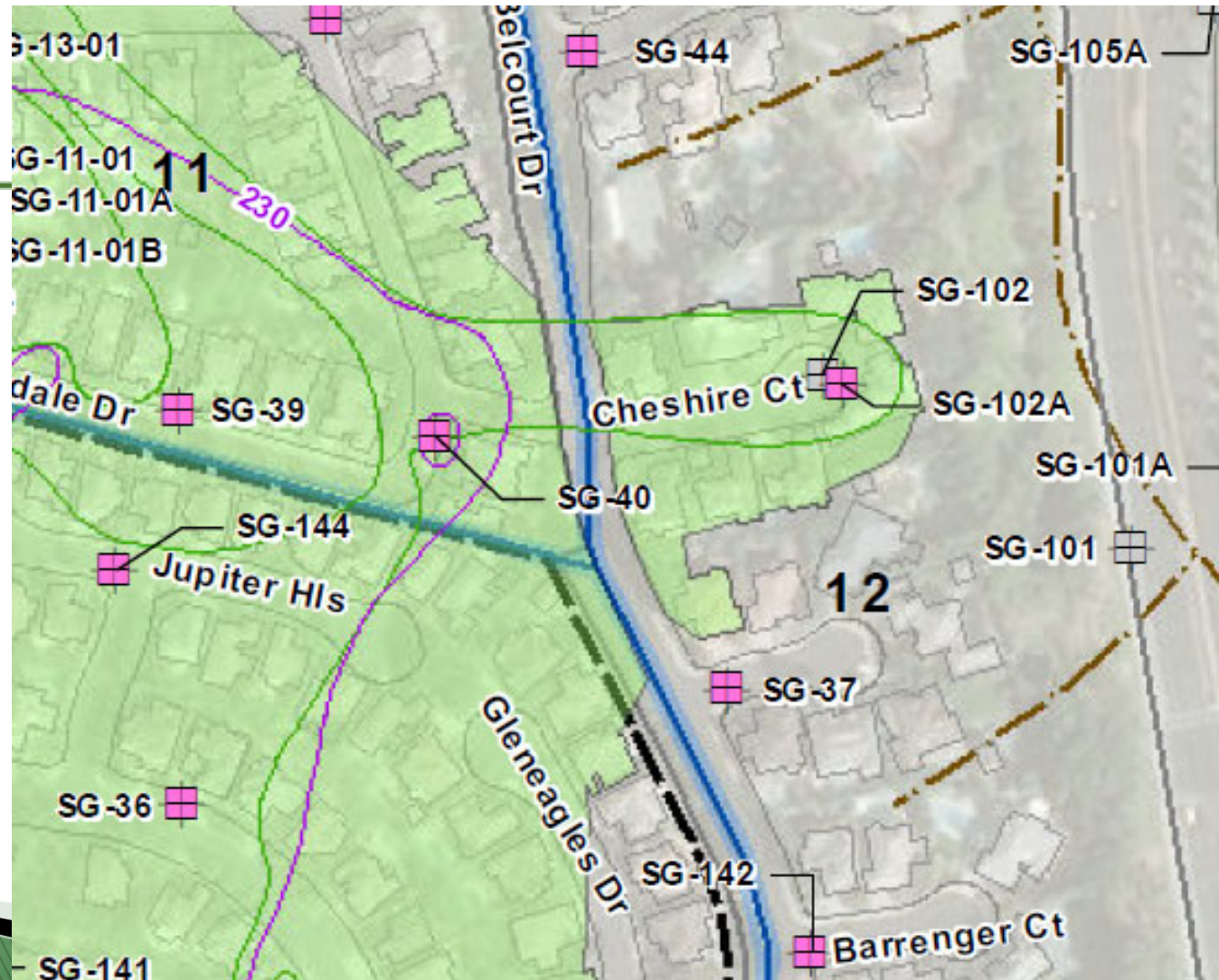




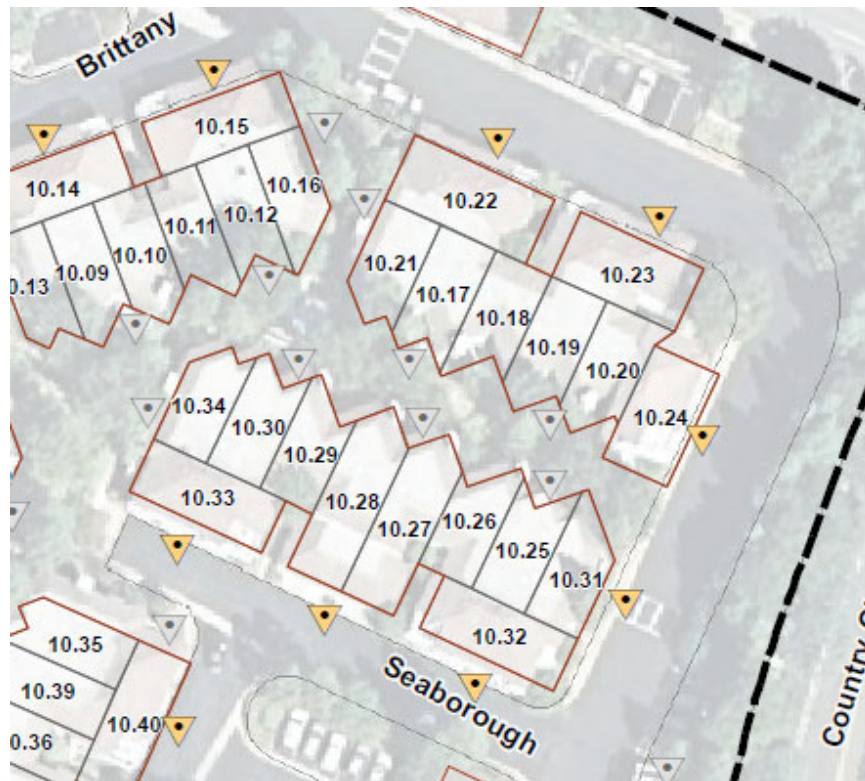
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Indoor Air Investigation



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Indoor Air Investigation Project Totals

549 homes that need sampling

327 signed access agreements (60%)

300 homes sampled (55%)



Indoor Air Testing Results

91 homes with PCE
and/or TCE over
ESLs

- ~26 homes appear to have VI occurring.
- Short-term mitigation measures being offered.

7 homes with TCE
over short-term
action levels

- 5 homes offered air purifying units.
- 3 homes concluded to be an indoor air source.

Sewer Gas Sampling



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Sewer Gas Sampling



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Resulting Actions

- Short-term mitigation measures are air purifying units.
- An SVE pilot test conducted at 3 different locations across the investigation area.
- A feasibility study and mitigation/remedial action plan is being prepared.
- Risk assessment reports are currently being prepared.
- Long-term indoor air monitoring plan being developed.



Public Outreach and Communication

- Community Fact Sheets – 5 distributions
- Public Meetings – 6 events to date
- Survey regarding public outreach during Covid-19
- Lyris list for Water Board email notification
- GeoTracker and a Water Board webpage
- A site-specific website and 800 numbers set up by the RP
- Local information repository - Library




Community Meetings - Planning

- 90/10 Rule
- Understanding the public's key concerns.
- Establish key message points.
- Discuss potential questions, especially the difficult ones.
- Provide handouts, as necessary.
- Involving the “right” people.



Community Meetings - Planning



Trichloroethylene (TCE) in Indoor Air

What is Trichloroethylene (TCE)?

- Trichloroethylene (TCE or trichloroethene) is a toxic, clear, colorless liquid. Liquid TCE evaporates quickly into the air. It is not flammable.
- TCE is primarily used in industry to remove grease from metal parts and to make refrigerants.
- TCE can also be found in consumer products such as automotive degreasers, stain removers, paint removers, and adhesives.

How can I be exposed to TCE?

Common ways people may be exposed to TCE include:

- Living or working in a building that is above soil or groundwater contaminated with TCE;
- Working in industries that produce or use TCE;
- Using TCE-containing products at home.


How can TCE affect my health?

- Short-term exposure to TCE in the first trimester of pregnancy may increase the risk of heart defects in the baby.
- Long-term exposure to TCE can impact the immune system, kidney, male reproductive system, and liver. Long-term exposures also increase the risk of kidney cancer and possibly other types of cancer.
- The health effects of TCE depend on many factors, such as:
 - The amount of TCE in air,
 - How long people breathe it, and
 - Individual sensitivity to the chemical.

What can I do to reduce my exposure to TCE in my home?

- Avoid using products containing TCE, and follow directions when using them.
- Ventilate your home frequently by opening the windows and doors.
- For more information reducing your exposure to chlorinated chemicals, such as TCE, see the Air Resources Board factsheet on *Chlorinated Chemicals in Your Home* (<https://www.arb.ca.gov/research/Indoor/clguide.pdf>).

Office of Environmental Health Hazard Assessment (OEHA), California Environmental Protection Agency
Sacramento | California | November 2018



VAPOR INTRUSION

Frequently Asked Questions

ROLE OF THE REGULATORY AGENCY

What is the role of the Santa Ana Regional Water Quality Control Board?

The Santa Ana Regional Water Quality Control Board (Regional Board) is a state regulatory agency under the umbrella of the California Environmental Protection Agency (CalEPA). The Regional Board makes critical water quality decisions for the region, including setting water quality standards, issuing permits (waste discharge requirements), determining compliance with those requirements, and taking appropriate enforcement actions. In the case of the Former Ford Aeronautics Facility (Site), the Regional Board oversees the Responsible Party that caused the contamination, Ford Motor Company (Ford), to ensure that Ford conducts the appropriate assessment and remediation of the Site.

TERMINOLOGY

What is vapor intrusion?

Vapor intrusion is the movement of vapor-forming chemicals (e.g., radon, volatile organic compounds, or semi-volatile organic compounds), from an underground source such as contaminated soil and/or groundwater, into the indoor air of an overlying building. An example of vapor intrusion is the seepage of radon gas into homes in the Midwest and on the east coast as well as some locations in California.

What are VOCs?

Volatile Organic Compounds (VOCs) are chemicals that are contained in products commonly used in industry as well as in the home. Products containing VOCs include paints, paint strippers, cleaning supplies, and markers. VOCs are also found in car exhaust, cigarette smoke, air fresheners and other scented materials, dry cleaned clothes, gardening chemicals, and fuel.


What is TCE?

Trichloroethylene (referred to as trichloroethene or TCE) is a VOC that is used as a solvent for degreasing metal parts during the manufacture of a variety of products. It can be found in consumer products, including some wood finishes, adhesives, paint removers, and stain removers. Due to its widespread use, very low levels of TCE are common in the air of homes and businesses and in outdoor air in urban areas.

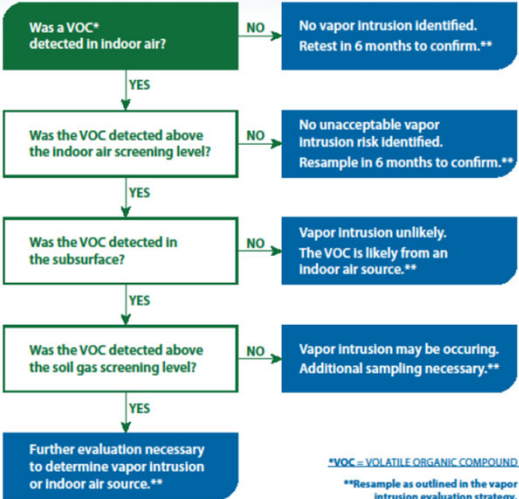
What is PCE?

Tetrachloroethylene (referred to as tetrachloroethene or PCE) is a VOC that is commonly used in dry cleaning and metal degreasing. It is also used to make other chemicals and can be found in some consumer products. Similar to TCE, PCE is also volatile, highly stable, and nonflammable at room temperature.

Former Ford Aeronautics Facility | Newport Beach, California
February 2019 | 1



How to interpret your INDOOR AIR RESULTS



Was a VOC* detected in indoor air?

- NO: No vapor intrusion identified. Retest in 6 months to confirm.**
- YES: Was the VOC detected above the indoor air screening level?

Was the VOC detected above the indoor air screening level?

- NO: No unacceptable vapor intrusion risk identified. Resample in 6 months to confirm.**
- YES: Was the VOC detected in the subsurface?

Was the VOC detected in the subsurface?

- NO: Vapor intrusion unlikely. The VOC is likely from an indoor air source.**
- YES: Was the VOC detected above the soil gas screening level?

Was the VOC detected above the soil gas screening level?

- NO: Vapor intrusion may be occurring. Additional sampling necessary.**
- YES: Further evaluation necessary to determine vapor intrusion or indoor air source.**

*VOC = VOLATILE ORGANIC COMPOUND
**Resample as outlined in the vapor intrusion evaluation strategy.

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Community Meetings – Presenting Information

- Utilize public participation and/or communication specialist.
- Understand your audience.
- Utilize visuals and recap key points.
- Ensure established key message items are adequately addressed.



Community Meetings – Presenting Information

- Utilize subject matter experts.
- Discuss the “hard” questions ahead of time.
- Follow up on questions that can not be answered during the meeting.



Adaptive Approach

- Community meetings
 - Adjusting community outreach as necessary
- Adding complementary lines of evidence as appropriate



Transparency

- Answering the “hard” questions.
- ESL update discussion.



Key Components for Successful Investigation

- Collaborative Communication
- Adaptive Approach
- Transparency
- Prioritize buildings and select sampling approach.
- Evaluate VI risk with actual soil gas results.
- Confirm if VI risk exist with indoor air data.
- Evaluate both current and future risk.





Any Questions?

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