ENCLOSURE 1

Current SONGS Switchyard Area
Synchronous Condenser Footprint Proposed Characterization
for Final Status Survey

AREVA

AREVA Inc.

TECHNICAL DATA RECORD

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SONGS SWITCHYARD AREA SYNCHRONOUS CONDENSER FOOTPRINT PROPOSED CHARACTERIZATION FOR FINAL STATUS SURVEY

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Safety Related? ☐ YES ☒ NO

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Does this document contain assumptions requiring verification? ☐ YES ☒ NO

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Record of Revision

Revision No.	Pages/Sections/ Paragraphs Changed	Brief Description / Change Authorization
000	ALL	Initial Issue. Agreed Customer required format includes sections as listed in the Table of Contents
001	Sections 1, 2 and 6	Added Phase 4 for sample and analysis of engineered fill prior to its' installation at the construction site.

TABLE OF CONTENTS

1.0 BACKGROUND

To compensate for the elimination of the San Onofre Nuclear Generating Station (SONGS) power generation from their transmission system, San Diego Gas and Electric (SDG&E) has proposed to construct one 225 MVAR synchronous condenser (SyncCond) in the SDG&E managed portion of the SONGS switchyard (Figure 1). The structure that is being built is sized to accommodate a second condenser, but only one is planned at this time. The proposed site of the SyncCond construction is shown in Figure 2. In addition, to support a cold and dark approach to decommissioning of the site, Southern California Edison (SCE) is in the process of constructing a Mechanical and Electrical Equipment Room (MEER), associated vaults for switch gear and underground electrical cable conduits in the Switchyard, see Figure 3. The new construction requires removal of current site features consisting of three concrete pads, one with shed cover, but each are no longer needed to support current operations at SONGS.

The Historical Site Assessment (HSA) of the SONGS site (Reference 8.1) has initially classified the Switchyard in accordance with NUREG-1575 (MARSSIM) (Reference 8.2) as a MARSSIM Class 3 due to the unconfirmed but low potential for residual radioactivity, which if present, is not expected to exceed a small fraction of the Nuclear Regulatory Commission (NRC) screening values. See Section 5.1.14 of the HSA for additional details.

SCE and their Site Characterization Team (SCT) has developed this Technical Data Record (TDR) as a planning tool to communicate to stakeholders a conservative approach that will minimize the risk of major impacts to the MEER and SyncCond structures and accommodate Final Status Survey (FSS) efforts during SONGS Units 2 and 3 license termination once decommissioning and dismantling (D&D) has been completed. This will be accomplished in a phased approach by performing site characterization surveys of the Switchyard area (SYA) and focused surveys for the construction sites of the SyncCond and MEER with the same rigor as a FSS and establishing a cross-contamination prevention plan.

It is understood that a FSS in the SYA will occur after the D&D of SONGS Unit 2 and Unit 3 facilities and site. The soils beneath the newly installed MEER and SyncCond structures will be inaccessible to the FSS team without major work. The surveys performed by the SCT as described in this TDR will provide documentation that the soils beneath the MEER and SyncCond base pads met current license termination criteria before construction. This characterization survey data may be integrated with future SYA FSS data to show the SYA meets license termination criteria.

To date, two characterization surveys have been performed as discussed in Attachment 1. The first was performed for the general Switchyard area. The second was specifically for the MEER footprint. A third survey, as described below, will be performed specifically for the SyncCond construction site and building footprint.

2.0 PURPOSE

The SyncCond building footprint characterization survey will be designed and conducted to confirm that there is no residual radioactivity above unrestricted release criteria in the area. The survey design will meet NRC Final Status Survey (FSS) standards and provide data showing the site proposed for construction of the SyncCond buildings are suitable to release for unrestricted use in accordance with 10 CFR 20 prior to construction of the buildings.

The radiological characterization of the proposed SyncCond footprint will be performed in 4 phases. Phase 1 and Phase 2 work involves collaboration between URS under contract with SDG&E to perform a geological technical evaluation and the AREVA/BHI Site Characterization team under contract with SCE.

The goal of the URS team is to obtain samples sufficient to determine requirements for site preparation, design of the SyncCond building(s), finalize actual building locations and collection of samples to test for presence of potential non-radiological hazardous substances in site soils. The goal of the SCT is to perform measurements and samples for potential radionuclides of concern sufficient to ensure the location selected to construct the SyncCond building(s) are suitable to release for unrestricted use to support site preparation for construction. Phase 3 of the radiological surveys will occur once excavation to the lowest grade surface soils has been completed for the construction site. Phase 4 of the radiological surveys will consist of sampling and analysis of the engineered fill used for final preparation of the construction site and will occur before installation of the fill. The engineered fill will raise the level of the site for final building footprint definition. Sampling and analysis of the fill prior to installation will ensure the integrity of the Phase 3 survey data. The Phase 3 and Phase 4 can coincide with Nuclear Regulatory Commission (NRC) participation, if desired, at a later date as determined by SCE and the NRC. The Phase 3 surveys will include: gridding the graded construction site, identifying and marking twenty (20) survey measurement locations (SMLs), performing direct gamma measurements and a 0 to 15cm depth surface soils sample at each of the SMLs. The survey will also include a 100% walkover scan survey of the graded construction site to show homogeneity of surface soils in the SyncCond survey area. Four (4) samples from Phase 1, 2, 3 and 4 surveys will be sent to an offsite laboratory for hard to detect (HTD) radionuclide analysis; one (1) from Phase 3 composites of surface soils, one (1) from Phase 4 composites of surface soils and two (2) from composites from Phase 1 and 2 for the subsurface soils from the geotechnical evaluation bore holes.

The plan, process, and methodology to be used to meet the referenced regulatory requirements are presented in San Onofre Nuclear Generating Station Site Characterization Plan, AREVA Document 63-9226835-000 (SCP) (Reference 8.3). As provided in the SCP, two survey packages will be developed to provide specific instructions to conduct the radiological surveys, one survey package for the Phase 1 and Phase 2 work, and one survey package for the Phase 3 and Phase 4 work. The survey packages will provide survey data quality objectives (DQOs) and the detailed instructions for implementation of the field activities required to characterize the SyncCond construction site. Following the requirements of the SCP provides reasonable assurance that new construction SyncCond will not need to be disturbed or modified to allow access to the soil beneath for performance of the future site wide FSS and release of the site as required for 10 CFR 50 license termination. Further details are discussed below.

This TDR provides a summary of the purpose of and the methods to be used for the radiological characterization of the proposed SyncCond construction site and footprint. It does not provide design inputs to or requirements for the Site Characterization Plan or SyncCond footprint survey package(s).

3.0 METHODOLOGY

The requirements of §20.1402, Radiological criteria for unrestricted use (Reference 8.6), will be followed.

Ensuring that the 10 CFR 20 requirements are met will be done by (1) using NRC Screening values from NUREG-1757, Volume 2, Appendix H (Reference 8.7) to demonstrate compliance with criteria; and (2) performing surveys in accordance with the approved Site Characterization Plan. The types and quantities of surface/near surface surveys will be consistent with the NUREG 1575 (MARSSIM) guidance for FSS and NUREG-1757 guidance for performing characterization. The number of these survey measurements and locations will be conservatively estimated and will meet or exceed requirements. In addition, subsurface soil samples as described below will be collected and evaluated.

4.0 SITE CHARACTERIZATION PLAN (SCP)

The SCP will govern performance of the surveys and evaluations performed for characterization of the SyncCond area. The SCP was developed in accordance with MARSSIM, NUREG-1757, and ASTM-E1892-2009, Standard Guide for Preparing Characterization Plans for Decommissioning Nuclear Facilities (Reference 8.8). Additional guidelines were obtained from ANSI/HPS N13.59 – 2008, Characterization in Support of Decommissioning Using the Data Quality Objectives Process (Reference 8.9). The SCP was prepared by the AREVA Team and reviewed and approved by the SCE Decommissioning and Dismantlement Team (DDT). Radiation Safety and Control Services (RSCS), acting as a Subject Matter Expert, performed an independent third party review of the SCP.

The SCP meets MARSSIM requirements for performing an FSS and includes the methodology required for determining the number of survey measurement locations (data points). To align the SyncCond surveys with FSS requirements, the number of surveys (data points) are developed using a combination of the guidance provided in NUREG-1757 and MARSSIM Section 5.2, Survey Design (*Final Status Surveys*).

Use of the SCP with survey selection in accordance with NUREG-1757 and MARSSIM Section 5.2 is therefore consistent with NRC requirements for performing Final Status Surveys for an area with the MARSSIM classification of the Switchyard/SyncCond area (Impacted Class 3 survey unit).

5.0 DERIVED CONCENTRATION GUIDELINE LEVELS (DCGLS)

A DCGL is defined in the MARSSIM as the radionuclide-specific concentration within a survey unit corresponding to the release criterion to demonstrate compliance with 10 CFR 20.1402. For the SyncCond area, the release criterion is based on the NRC resident farmer scenario for unrestricted use that dose does not exceed 25 mrem/year TEDE (Total Effective Dose Equivalent). This is the most restrictive criteria currently specified by NRC.

DCGLs to be used for the SyncCond area characterization data evaluation are the generic screening levels published by the NRC in NUREG-1757. These DCGLs are considered to be very conservative and are pre-approved by the NRC.

In addition to the use of conservative DCGLs, the instrumentation used will be able to detect the radionuclides of concern with measurement sensitivities or minimum detectable concentrations (MDC) at 10% of the NRC DCGL values for isotopic analyses and less than or equal to 50 % of the NRC DCGL values for scan surveys, thus providing margin should more conservative criteria be applied.

The use of the conservative DCGLs along with the ability to detect radionuclide activity at a fraction of the criteria is consistent with NRC requirements for performing FSS and for ensuring that the dose to individual members of the public does not exceed the limits and standards of 10 CFR Part 20.

6.0 SURVEY PERFORMANCE

Phase 1 survey work for SyncCond construction site began Monday 19-Jan-15. As discussed earlier, the Phase 1 and 2 surveys are a collaborative effort with the SCT working in conjunction with URS to obtain data for a geological technical evaluation and for radiological evaluation of seven (7) survey measurement location (SMLs) within the switchyard area (SYA). The radiological survey during Phase 1 will include direct gamma measurements, 0 to 15 cm depth surface soils samples and 0-5' depth subsurface soil samples at the seven (7) geological evaluation bore hole SMLs. Phase 2 is scheduled to begin on Monday 26-Jan-15 and includes collection of 5' to 40' depth subsurface soil samples at the seven (7) geological evaluation bore hole SMLs. The Phase 1 and Phase 2 work is covered by one survey package designated

A1501 303C1. A new survey package designated A1501 304C1 will be developed for the Phase 3 and Phase 4 survey work. Phase 3 will occur once excavation of the construction site has been completed, and Phase 4 will occur prior to installation of the engineered fill at the construction site. It is anticipated that the Phase 3 and Phase 4 survey work will be scheduled to coincide with NRC participation if desired. Like the Phase 1and 2 survey work the Phase 3 and Phase 4 survey will be designed according to the MARSSIM to include the elements and rigor of a final status survey (FSS) to show that the lowest grade soils and the engineered fill beneath the new SyncCond building(s) will meet the criteria in 10 CFR 20 Subpart E and be suitable to release for unrestricted use.

The Phase 1, 2, 3 and 4 survey work is being performed to ensure that only accessible surface soils and building exterior surface are subject of the FSS that will be performed post D&D of Unit 2 and Unit 3 facilities and site to terminate the NRC license. The Phase 1, 2, 3 and 4 work is to ensure that the soils beneath the SDG&E SyncCond building(s) would not be subject to the SYA FSS.

To properly characterize the SyncCond area to FSS rigor, the following surveys will be performed. All surveys will be performed using approved survey packages prepared in accordance with the SCP. The survey packages will be reviewed by SCE DDT and RSCS.

The surveys to be performed for Phase 3 according to survey package A1501 304C1 for the SyncCond construction site excavation will include:

- The SyncCond construction site excavation will be gridded and twenty (20) SMLs marked in the survey area. The twenty (20) survey measurement locations are a conservative number for a Class 3 survey unit of this size area per the MARSSIM and NUREG-1757.
- Walk over scan survey of 100% of the SyncCond construction site excavation surface area using a Ludlum 44-10 gamma scintillation detector. The walkover scan speed will be performed to achieve minimum detectible count rate (MDCR) of less than 50 % of the NRC screening values,
- At the twenty (20) SMLs, static measurements for gamma emitting radionuclides will be performed using Ludlum 44-10 gamma scintillation detectors. The measurements will be performed in accordance with BHI Energy procedure ENG-OP-001, Radiological Survey Performance (Reference 8.10) and ENG-OP-004, Use of Ludlum 2350-1 w/Gamma Scintillation Detector (Reference 8.11).
- Near surface (i.e. at 0" to 6" from the top surface) soil samples will be collected in accordance with BHI Energy procedure ENG-OP-002, Volumetric and Material Sampling (Reference 8.12), at each of the SMLs. The soil samples will be evaluated in the on-site laboratory using gamma spectroscopy analysis in accordance with BHI Energy procedure ENG-OP-024, Canberra Genie-PC Gamma Spectroscopy System Operation and Calibration (Reference 8.13).

The surveys to be performed for Phase 4 sampling and analysis of the engineered fill will also be according to survey package A1501 304C1 and will include collection of five random soil grab samples collected in accordance with BHI Energy procedure ENG-OP-002, Volumetric and Material Sampling (Reference 8.12), at each of the SMLs. The soil samples will be evaluated in the on-site laboratory using gamma spectroscopy analysis in accordance with BHI Energy procedure ENG-OP-024, Canberra Genie-PC Gamma Spectroscopy System Operation and Calibration (Reference 8.13).

Four (4) samples from Phase 1, 2, 3 and 4 surveys will be sent to an offsite laboratory for hard to detect (HTD) radionuclide analysis, as follows:

- Two (2) of the near-surface soil samples and two (2) of composite subsurface soil (geotechnical boring) samples from Phase 1 and Phase 2 survey work will be sent to an offsite laboratory for hard to detect (HTD) radionuclide analysis per 10CFR61 (Reference 8.15). This is conservative since the previous surveys of the Switchyard, i.e. gravel base, asphalt paved areas and MEER footprint, saw only two (2) samples out of fifty-four (54) with a minimal indication of licensed radiological materials. One sediment sample location showed Cs-137 at 9.64% of the NRC Default Screening Level and the other sediment sample location at 8.36% of the screening level for Co-60 and Cs-137 (sum of the fractions).

7.0 CONTAMINATION PREVENTION AND MONITORING PLAN

To ensure that the area is not impacted by future decommissioning activities, a Cross Contamination Prevention and Monitoring Plan (CCPMP) will be developed and implemented. The plan is expected to include both administrative controls to prevent radioactive material from entering the area and periodic monitoring and sampling of areas to verify that the areas are not impacted during decommissioning.

8.0 DATA EVALUATION AND REPORTING

8.1 Data Evaluation

Direct gamma measurements collected during the characterization surveys and scan data will be compared against reference data representing background levels of similar soils to determine if locations of elevated activity are present. The soil sample analysis results will be compared against the soil acceptance criteria in Table 2-2 of the SCP. If multiple radionuclides attributable to licensed activities were identified in the soil, the sum of the fraction rule will apply. Individual survey results exceeding 50% of the DCGL criteria will be evaluated further by recounting the sample or by collection and analysis of additional samples at the location. Survey results that approach or exceed the DCGL acceptance will be identified for potential remediation efforts. Measurements exceeding the criteria are considered contamination and cause for additional investigation as needed in order to bound the lateral and vertical extent of the contamination for subsequent decontamination and/or remediation actions.

At the completion of the surveys, measurement results will be obtained and evaluated according to the characterization DQOs as stated in the survey package instructions. If the lateral extent of contaminated areas has not been determined by the measurements prescribed in the survey package instructions, more measurements may be prescribed to delineate where surface contamination is no longer present.

If the vertical extent of contaminated areas has not been determined by decontamination of surface contamination and re-survey, or core bore samples prescribed in the survey package instructions, subsequent depth core bore samples may be prescribed to delineate where subsurface contamination is no longer present. The guidance provided in the MARSSIM of survey, measure, analyze data and data evaluation according to the survey DQOs will be repeated during the characterization. Once DQOs have been achieved, the characterization will be considered complete.

8.2 Report

Following the completion of measurements and sample analyses, the survey package for each survey area will be updated with results of the characterization surveys including any survey iterations performed. Once the initial characterization and subsequent iterations have been completed, a Characterization Survey Report and Technical Data Package will be prepared The Survey Report will include the Switchyard General Area, MEER Footprint, and Synchronous Condenser Footprint survey areas.

This technical data package will include at a minimum:

- Analytical results from the samples taken plus all quality samples;
- A copy of the logbook or field notes;
- Controlled series of documents, drawings, sketches, and/or maps that were used to identify sampling locations and perform samples.

The format and contents of the report will be consistent with MARSSIM and SCE Purchase Order (PO) requirements.

The report will be transmitted to SCE SONGS for review once the AREVA Team management has approved the report.

9.0 CONCLUSION

The design of the radiological surveys as described above is such that it meets the rigor of MARSSIM and NUREG 1757 guidelines for FSS. The risk of contaminating the Switchyard area during decommissioning will be minimized through implementation of a contamination control plan. Therefore, the risk of impacts to the MEER and SyncCond structures to accommodate access to the soil beneath for Final Status Survey (FSS) efforts during SONGS Units 2 and 3 license termination is minimal.

10.0 REFERENCES

8.1 AREVA Document 38-9229156-000, San Onofre Nuclear Generating Station Historical Site Assessment Report.

8.2 USNRC, NUREG-1575, Revision 1, Multi-Agency Radiation Survey and Site Investigation Manual (MARSSIM).

8.3 AREVA Document 63-9226835-000, San Onofre Nuclear Generating Station Site Characterization Plan.

8.4 10 CFR 50.83, Release of Part of a Power Reactor Facility or Site for Unrestricted Use

8.5 10 CFR 20, Subpart D, Radiation Dose Limits for Individual Members of the Public

8.6 10 CFR 20.1402, Radiological criteria for unrestricted use.

8.7 USNRC, NUREG-1757, Consolidated Decommissioning Guidance: Characterization, Survey, and Determination of Radiological Criteria, Volume II, Appendix H, Criteria for Conducting Screening Dose Modeling Evaluations.

8.8 ASTM-E1892-2009, Standard Guide for Preparing Characterization Plans for Decommissioning Nuclear Facilities.

8.9 ANSI/HPS N13.59 – 2008, Characterization in Support of Decommissioning Using the Data Quality Objectives Process.

8.10 BHI Energy Procedure ENG-OP-001, Radiological Survey Performance.

8.11 BHI Energy Procedure ENG-OP-004, Use of Ludlum 2350-1 w/Gamma Scintillation Detector.

8.12 BHI Energy Procedure ENG-OP-002, Volumetric and Material Sampling.

8.13 BHI Energy Procedure ENG-OP-0024, Canberra Genie-PC Gamma Spectroscopy System Operation and Calibration.

8.14 AREVA Document 12- 9225574-001, SONGS Site Characterization Project Quality Assurance Plan.

8.15 10 CFR 61, Licensing Requirements for Land Disposal of Radioactive Waste.

Figure 1
SONGS Switchyard

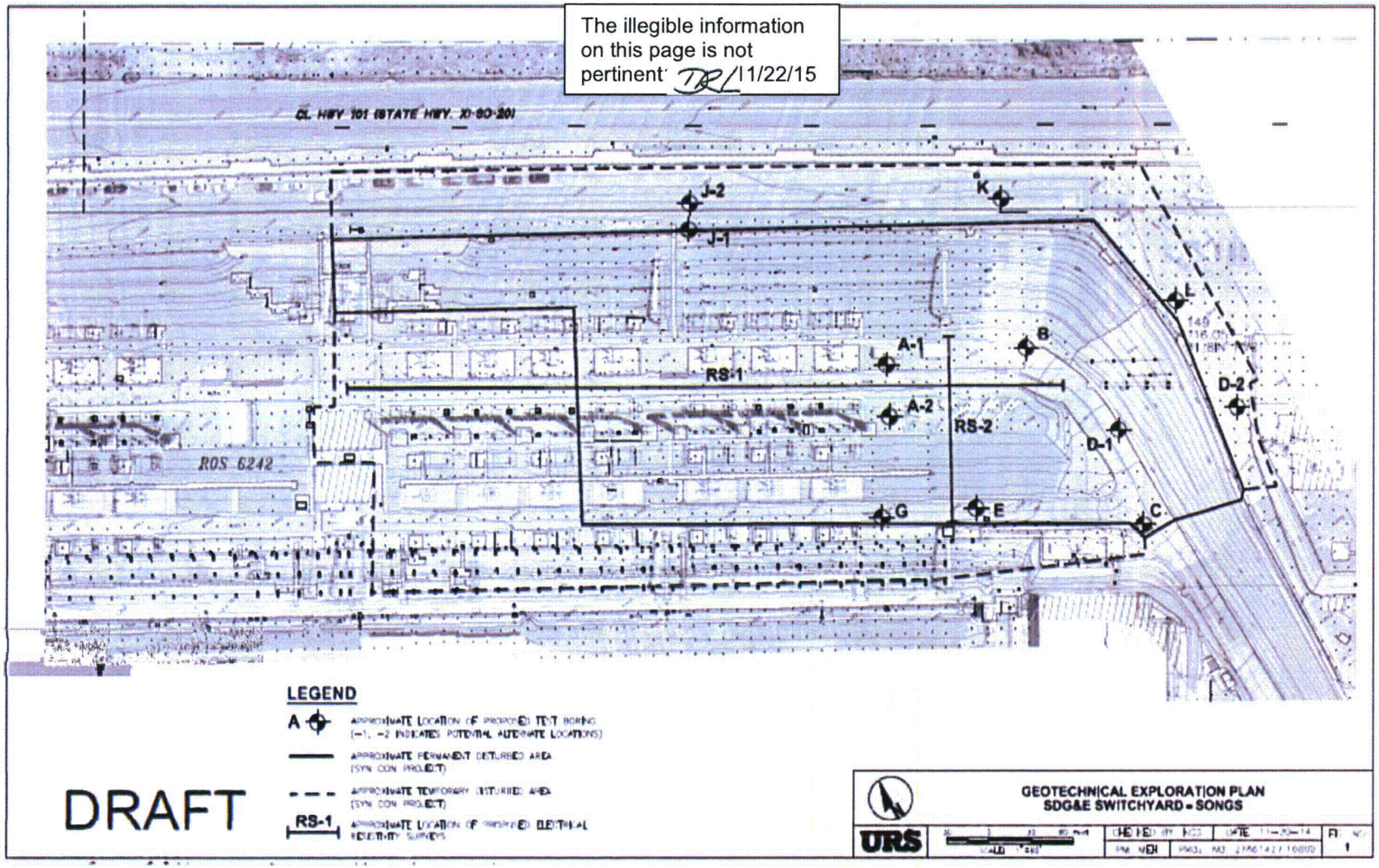


Figure 2
Synchronous Condenser Construction Site

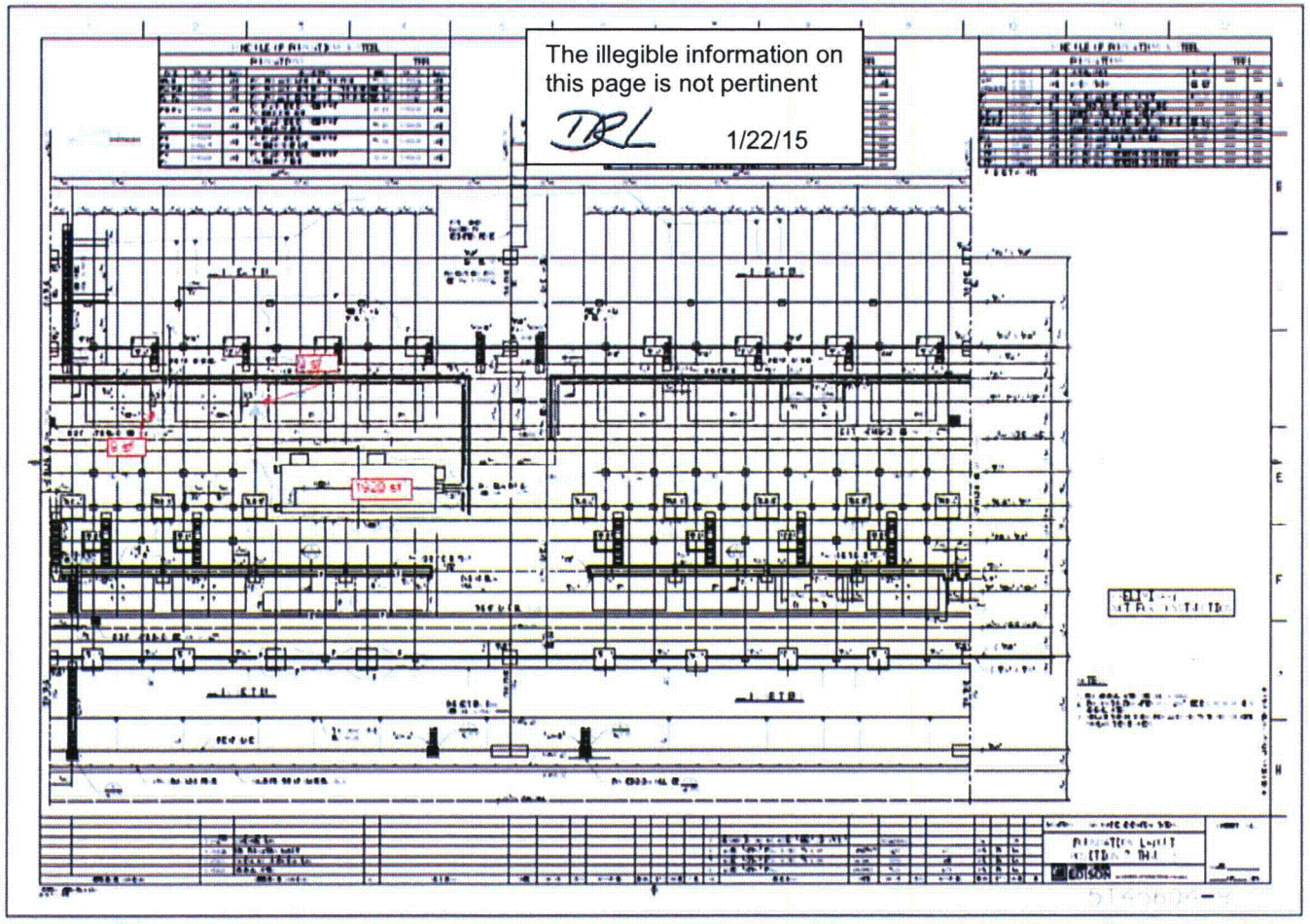
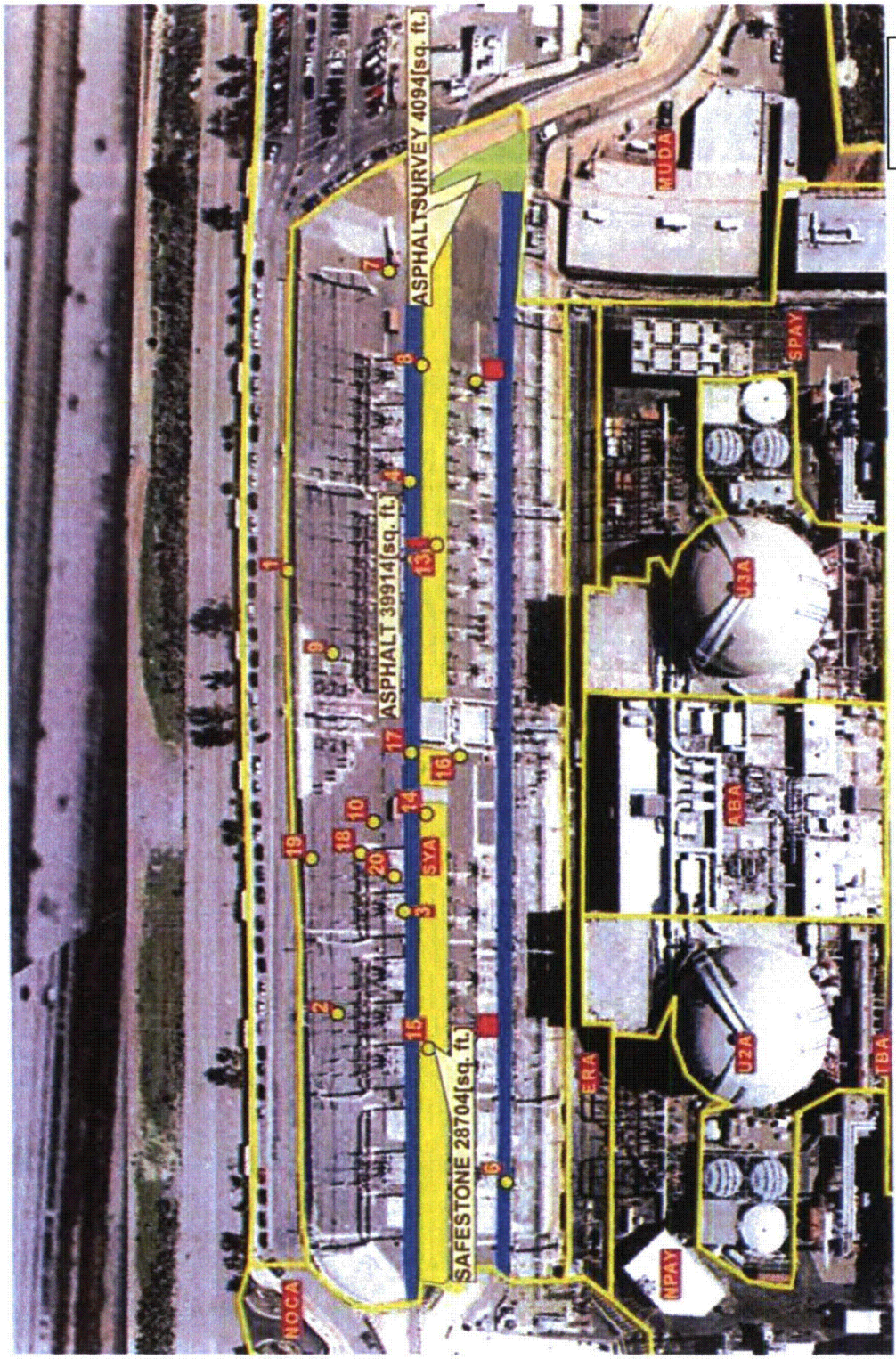


Figure 3
MEER Footprint

ATTACHMENT 1 – SWITCHYARD GENERAL AREA AND MEER CHARACTERIZATION SURVEYS

- Switchyard Area (SYA) - Gravel Base Area
  - Walk over scan survey of 10% of the surface area using a Ludlum 44-10 gamma scintillation detector.
  - At (20) randomly selected survey measurement locations (SMLs) within the SYA stone/gravel covered soil areas, remove the stone/gravel overburden, perform a contact gamma measurement and collect a 0 to 15 cm depth surface soil sample for gamma spectroscopy analysis.
  - Collected fourteen (14) sediment samples from concrete cable troughs, storm gutters and drains, and analyzed by gamma spectroscopy.
- Switchyard Area – Asphalt Paved (Roadway) Areas
  - Walk over scan survey of 10% of the surface area using a Ludlum 44-10 gamma scintillation detector.
  - At twenty (20) randomly selected SMLs within the SYA asphalt paved areas, perform contact gamma measurement.
  - At ten (10) SMLs, collected a surface asphalt sample for gamma spectroscopy analysis.
  - At one SML, collected a surface soil sample beneath the asphalt and analyzed by gamma spectroscopy
- MEER Site Excavation Area
  - Scanned 100% of prepared of the 2,000 ft^2 building footprint surface area with a Ludlum 44-10 gamma scintillation detector.
  - Collected a 0-6" surface soil sample at five (5) locations, one in each corner and one in the center of the prepared area for gamma spectroscopy analysis.
  - Collect soil from bottom of each of 14 pile holes and composite into three (3) samples that are representative of the 18' depth for gamma spectroscopy analysis.
  - One soil sample from the surface of excavation and one from the composite subsurface soil (pile hole) samples will be sent to an offsite laboratory (OL) for hard to detect (HTD) radionuclide analysis.

SONGS SWITCHYARD AREA SYNCHRONOUS CONDENSER FOOTPRINT PROPOSED CHARACTERIZATION FOR FINAL STATUS SURVEY



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