Operational Flexibility for Noise Emissions (Polygon Approach)
EBR Registry Number: 012-4493

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Canadian Solar Industries Association (CanSIA)
www.cansia.ca

Introduction

In June of 2015 CanSIA members met with staff from the Ministry of the Environment and Climate Change (MOECC) to review CanSIA's recommendations in respect of the Renewable Energy Approval's process, and specifically increasing operational flexibility of the REA. Our recommendations were focused on reducing the frequency of REA amendments which places undue burden on the MOECC, as well as on developers, financers, and engineering and construction companies of solar projects. Feedback based on that discussion was submitted to the MOECC later in June. CanSIA is resubmitting this feedback too the MOECC in recognition that operationalization of the concept of operational flexibility for REA amendments will be reflected largely in the associated REA Technical Guide.

In increasing operational flexibility, we also recognize that additional efforts will be required on the part of the solar project developer, such as increasing the study area and providing as-build specifics to the MOECC following completion of the project. Furthermore, it will also be necessary for solar project developers to ensure the community consultation is conducted in light of all potential site layout options and to ensure that all feedback is incorporated in the REA application.

During the June 9th discussion CanSIA and MOECC staff discussed how operational flexibility might be applied to equipment with noise emissions and a methodology for demonstrating that the "polygon approach" for inverter/transformer placement which would model the worst case scenario-analysis and demonstrate compliance with sound power level limits. The attached submission was been prepared to demonstrate how we envision the approach could work. We welcome feedback and are willing to meet with you anytime to review the details of this proposed approach.

Thank you again for your consideration of this submission, and we look forward to future discussions.

Operational Flexibility

A significant amount of solar facilities have had to obtain REA amendments in order to account for changes in equipment location and/or equipment specification. Most projects are permitted at a conceptual stage, with detailed design taking place after permitting is obtained. The requirement for amendment presents significant project delays, costs and creates undue burden on both project resources and MOECC staff in reviewing these applications. The industry is confident that proponents can effectively include methods for operational flexibility on equipment placement and equipment specification, all while demonstrating the project will be compliant and accountable. CanSIA is requesting consideration of implementing the ability to include operational flexibility in the assessment phase of a project and REA permit.

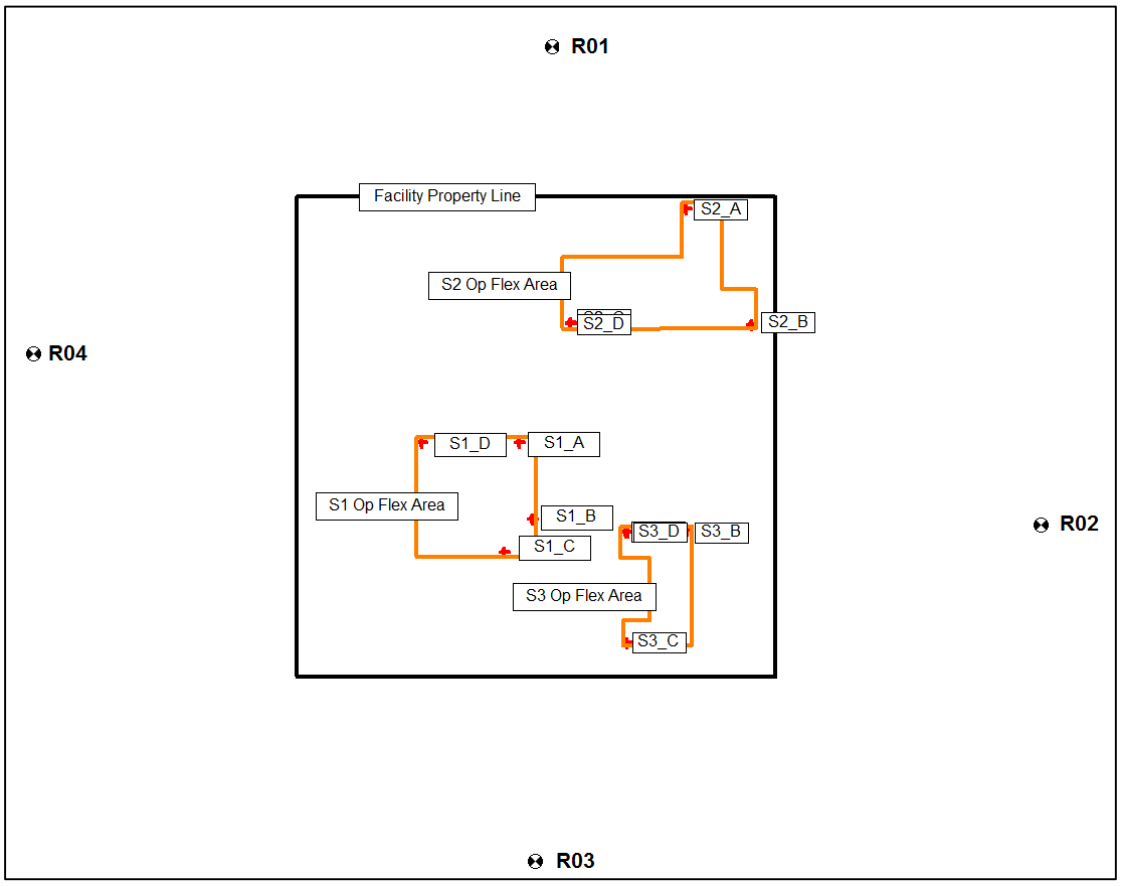
Separate concepts for equipment location and equipment specification are discussed below.

Equipment Location

The concept for providing operational flexibility with respect to equipment location is to constrain the equipment location to an area of placement (polygon) rather than a fixed point (1 UTM co-ordinate). The polygon would be based on a UTM co-ordinate system, however would include at least a 3 point constraint to create a triangle, and more points for squares, rectangles, or more complex shapes.

Through the modelling of several scenarios (i.e. potential equipment location placement within a polygon), the proponent would be able to demonstrate to the MOECC that the sound level limits at nearby receptors would be satisfied when all equipment is placed within their specified polygons.

The following figure depicts an example facility, bounded by a property line that contains three (3) sources (S1, S2, and S3). The facility is surrounded by four (4) receptors (R1, R2, R3, and R4). In order to incorporate operational flexibility, the proponent would create an area in which the sources (S1, S2, and S3) would operate (i.e. operational flexibility area). To demonstrate to the MOECC that applicable sound level limits would be satisfied the proponent would prepare and acoustic assessment report that provides four (4) different scenarios (A, B, C, and D). The concept of these scenarios is to take an individual source (S) and place it in locations to demonstrate a worst-case scenario and that applicable sound level limits could be satisfied at all receptors.



The following table outlines a sample calculation that was run on the herein discussed scenario. Noise contour plots of each scenario are included below.

Receptor ID	Scenario 1 (dBA)	Scenario 2 (dBA)	Scenario 3 (dBA)	Scenario 4 (dBA)	Max (dBA)	Sound Level Limit (dBA)	Meets Sound Level Limit?
R01	39.6	36.5	37.3	37.9	39.6	40.0	Yes
R02	35.7	37.4	35.3	35.1	37.4	40.0	Yes
R03	36.4	37.1	39.4	36.7	39.4	40.0	Yes
R04	33.5	32.8	33.8	35.0	35.0	40.0	Yes

In order to ensure compliance, it is suggested that the following format could be implemented into Schedule B of the REA permit to ensure accountability on placement.

Source ID	Easting (m)	Northing (m)	Sound Power Level (dBA)	Source Description
S1*	0	0	100	Inverter
	50	0		
	50	50		
	0	50		

*the source shall be constrained within the 200m long polygon bounded by the four (4) UTM co-ordinates listed and as depicted in Figure A.1 in the Acoustic Assessment Report.

To ensure transparency with the public, MOECC, and other potential renewable energy developers, the industry is open to providing documentation to confirm exact source location upon completion of construction. Confirmation of source UTM co-ordinates is already a condition that is typically specified in solar facility REA's and could be extended to include postings on project websites.

Equipment Specification

The equipment specification listed in REA's has traditionally been used as an additional description for a given source. Given that the permitting of projects can be a significant amount of time before actual construction takes places, there may be times where better and quieter equipment may be procured. From an acoustics perspective, the manufacturer, model, or even power (electrical not sound) rating of the equipment is not critical to ensuring compliance with applicable sound level limits.

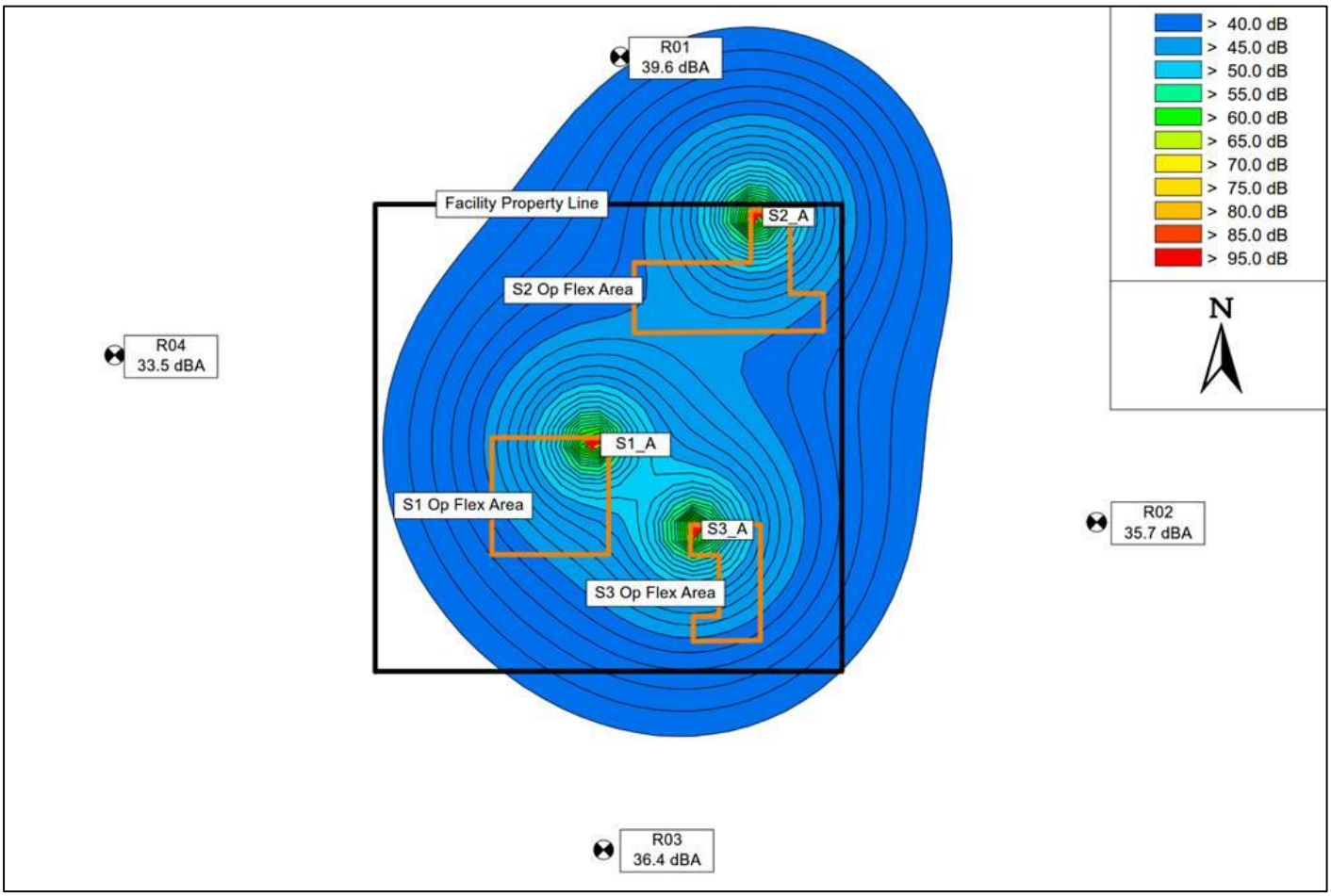
In order to allow for operational flexibility in equipment specification, it is requested that schedule B of the facility REA be tailored to only list the following equipment details:

- Source ID (used in acoustic assessment report)
- Sound power level
- Source location (or polygon)
- Basic source type descriptor (inverter, transformer etc.)

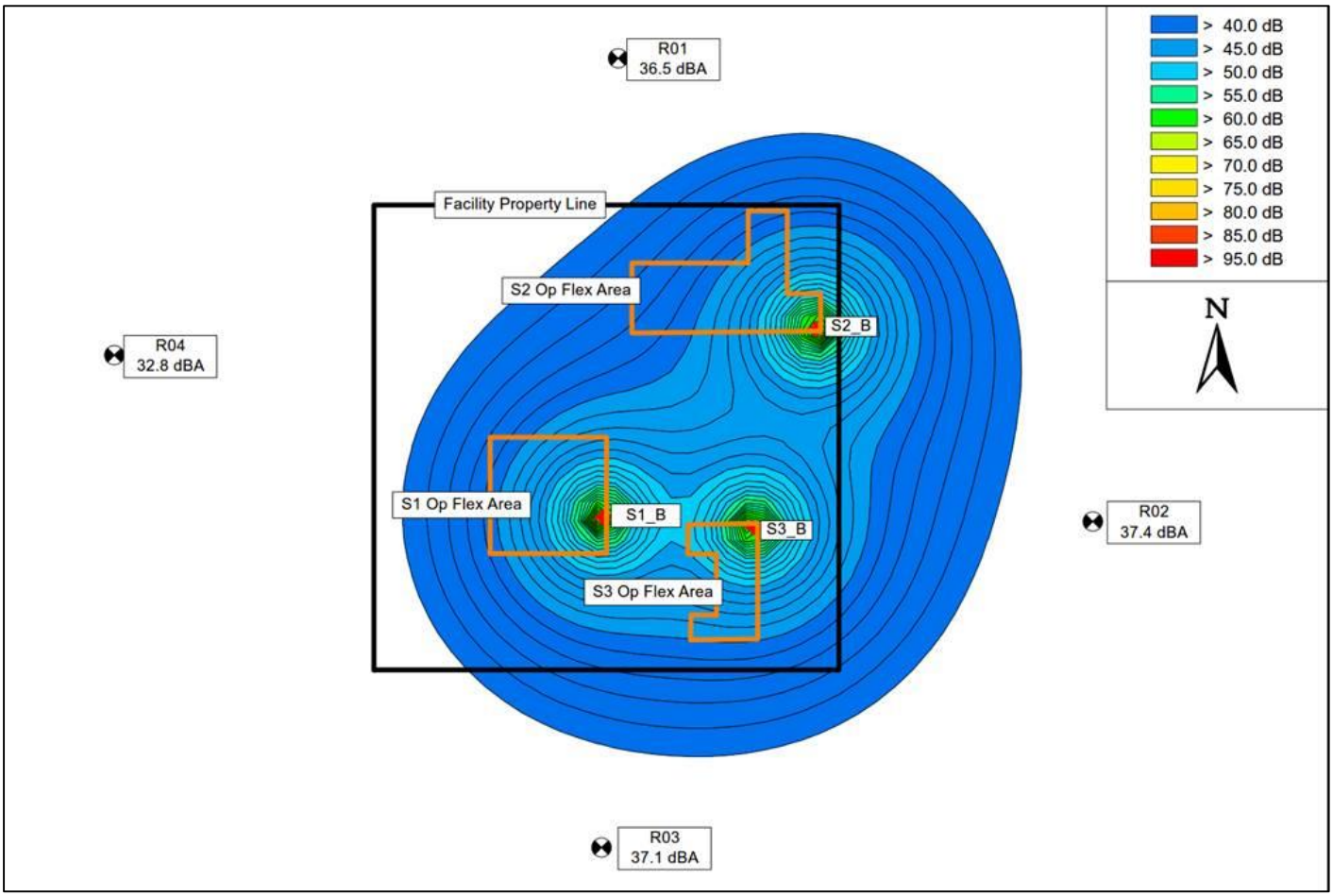
Further, the "equipment" description should be adjusted to include "up to" in describing how many sources are on site. In certain circumstances the nameplate capacity of the facility can be achieved through less equipment (i.e. 4 inverters instead of 5).

Noise Contour Plots

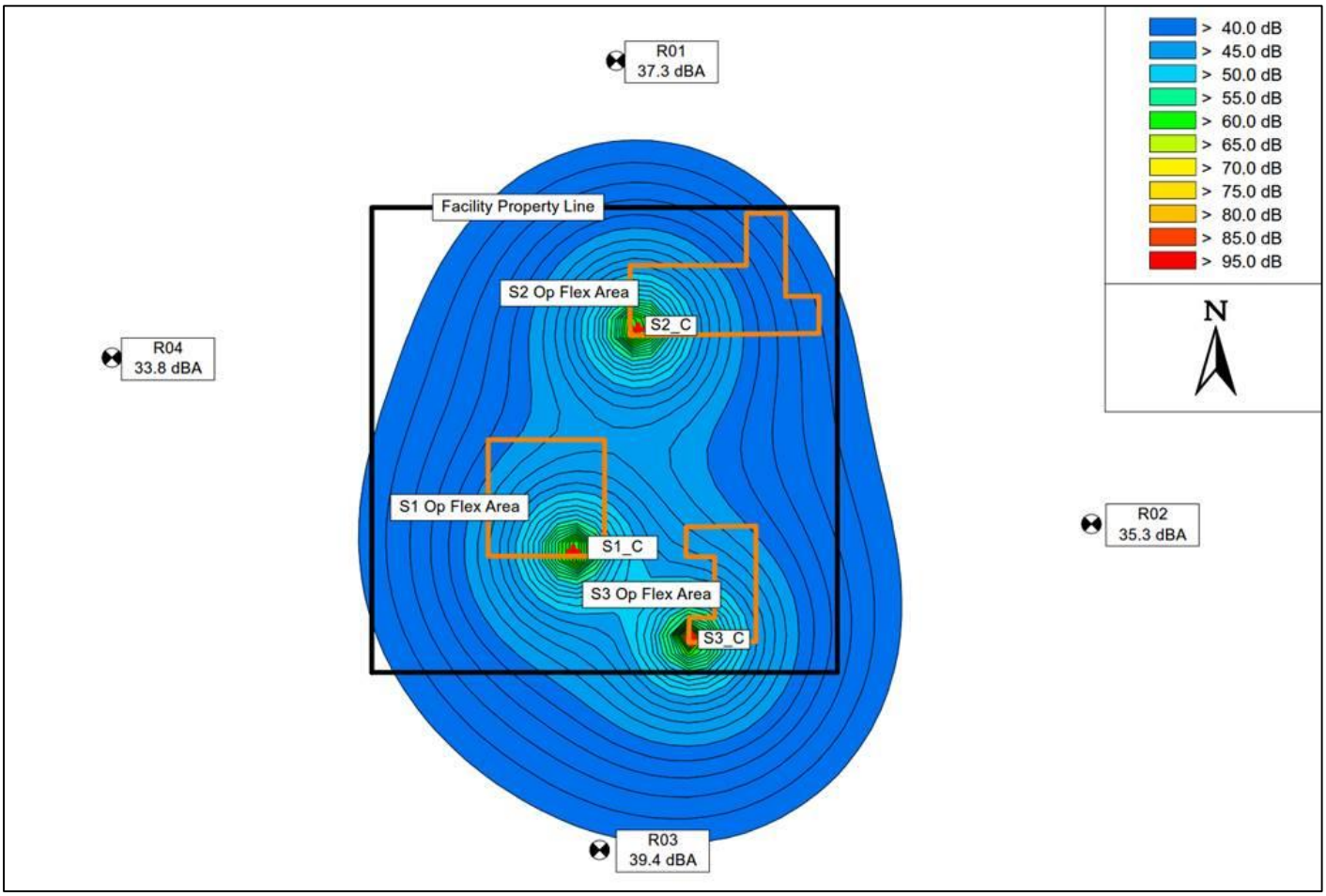
Scenario 1



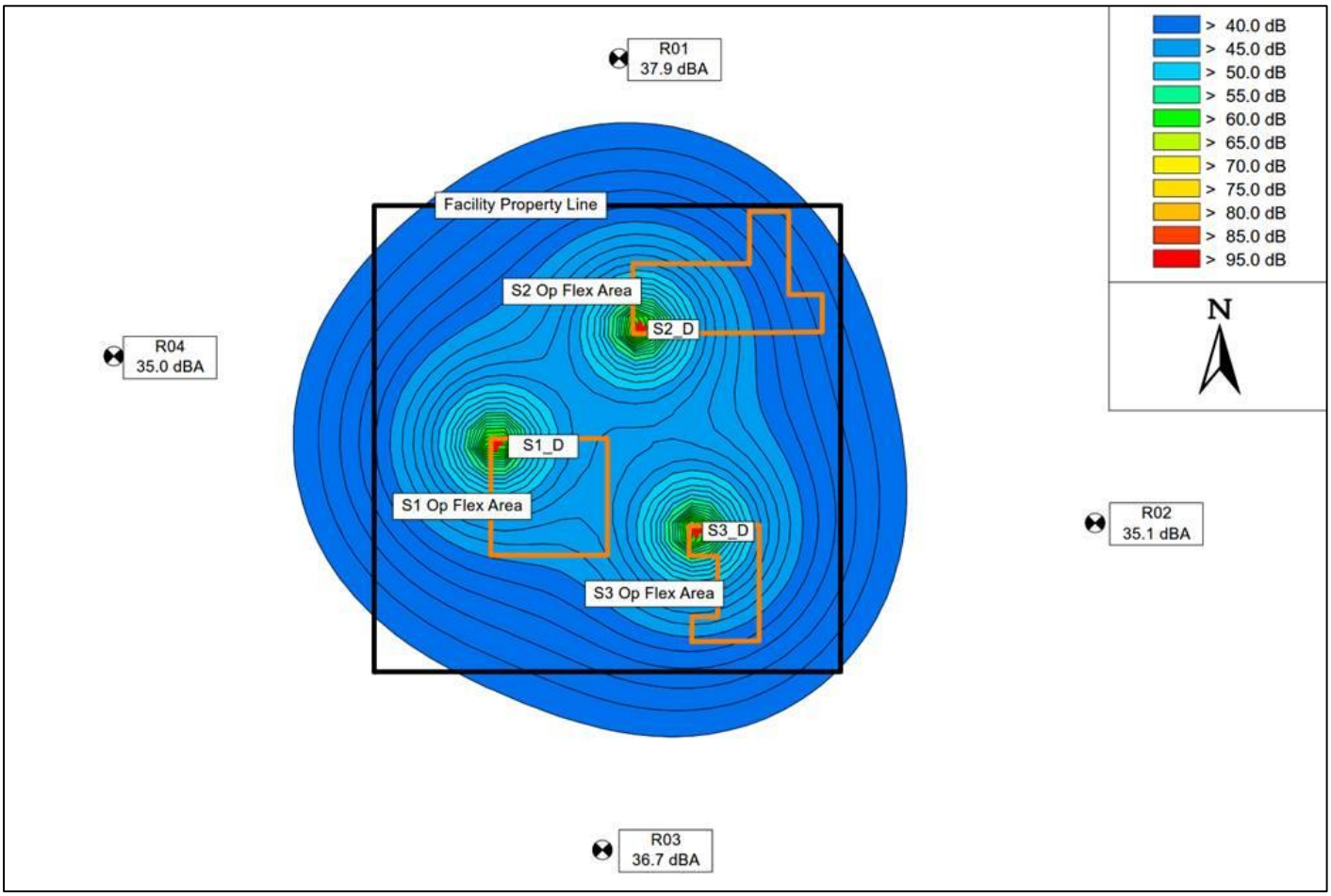
Scenario 2


R01
36.5 dBA
Facility Property Line
S2 Op Flex Area
S2_B
R04
32.8 dBA
S1 Op Flex Area
S1_B
S3_B
S3 Op Flex Area
R02
37.4 dBA
R03
37.1 dBA
> 40.0 dB
> 45.0 dB
> 50.0 dB
> 55.0 dB
> 60.0 dB
> 65.0 dB
> 70.0 dB
> 75.0 dB
> 80.0 dB
> 85.0 dB
> 95.0 dB
N

Scenario 3


R01
37.3 dBA
Facility Property Line
S2 Op Flex Area
S2_C
R04
33.8 dBA
S1 Op Flex Area
S1_C
S3 Op Flex Area
S3_C
R02
35.3 dBA
R03
39.4 dBA
> 40.0 dB
> 45.0 dB
> 50.0 dB
> 55.0 dB
> 60.0 dB
> 65.0 dB
> 70.0 dB
> 75.0 dB
> 80.0 dB
> 85.0 dB
> 95.0 dB
N

Scenario 4


R01
37.9 dBA
Facility Property Line
S2 Op Flex Area
S2_D
R04
35.0 dBA
S1_D
S1 Op Flex Area
S3_D
S3 Op Flex Area
R02
35.1 dBA
R03
36.7 dBA
> 40.0 dB
> 45.0 dB
> 50.0 dB
> 55.0 dB
> 60.0 dB
> 65.0 dB
> 70.0 dB
> 75.0 dB
> 80.0 dB
> 85.0 dB
> 95.0 dB
N