Recent advancements in mobile robotics have displayed impressive capabilities in traversing and accessing areas that are inaccessible to humans either due to the characteristics of the environment or potential hazards. Furthermore, these advancements within the field of mobile robotics, more specifically uncrewed ground vehicles (UGVs), give the ability to potentially survey, observe, and map these inaccessible areas for humans. However, one of the most challenging areas to implement this technology is underground environments. The main challenge with implementing this technology in underground environments is the dependence on either GPS or RF communication for UGVs to navigate properly. Therefore, in order to properly demonstrate the mapping capabilities of the UGV this challenge must be resolved. The overall goal of this study is to demonstrate the mapping capabilities of a UGV while addressing this challenge and documenting the implementation and testing phase of the robot. The proposed solution to this challenge is to implement a SLAM algorithm onto the main computational device of the UGV utilizing the Robot Operating System (ROS). The algorithm is the open-source software package Slam Toolbox developed by Steve Macenski. Furthermore, the sllidar_ros2 package from Slamtec will be used to gather the lidar data from an A3M1 2D lidar. A separate program will be created to gather odometry information for our UGV robot. All of these software packages will run together in a Docker environment. Through working on this project I have developed a better understanding of the world of robotics/autonomous systems, especially with applications such as navigation and mapping. Furthermore, through this project, I have been given exposure to how research is conducted within a DOE lab setting. As robotics/autonomous systems become more advanced it's important to pursue more avenues of research such as this project as it will ensure the development of our capabilities.