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## Radiological Assessment of the Beam Dump Facility at CERN

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The Beam Dump Facility (BDF) working group has recently submitted a Comprehensive Design Study of a new general-purpose fixed-target facility at CERN. In its initial phase, it will be dedicated to the Search for Hidden Particles (SHiP) experiment. A dense target/dump is located at the core of the facility, approximately 10 m underground. It has the aim of fully absorbing the high intensity 400 GeV/c Super Proton Synchrotron (SPS) beam, while maximizing the production of charmed and beauty mesons. Due to the high beam intensity delivered on the target, the high density and high-Z composition of the target/dump, significant activation of materials is expected. Additional radiation protection (RP) challenges arise from the proximity to the surface, other experimental facilities, and the CERN fence. The design of the facility was therefore heavily influenced by the evaluation of the RP risks. In particular, high prompt and residual dose rates require considerable shielding and remote interventions in the target area. Air, water and soil activation were carefully addressed and minimized in order to respect the applicable CERN RP regulations and objectives. To assess the above-mentioned aspects, extensive simulations were performed with the FLUKA Monte Carlo particle transport code.

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