



June 2023

Rapid DNA Pilot Final Report

In accordance to ESSB 5693 | Section 402(14)

WSP's Rapid DNA Pilot Program

'Rapid DNA' is a term used to describe the application of specialized instrumentation that allows for a fully automated process of developing a DNA profile from a sample in two hours or less without the need for conventional lab work or human interpretation. This technology is currently suitable for single-source samples such as known reference samples that have a reliably high yield of DNA from only one source.

In 2021, the legislature provided \$1,320,000 of the general fund—state appropriation for the fiscal year 2023 to the Washington State Patrol to implement an enhanced forensic capabilities pilot program using Rapid DNA technology. The pilot program aims to provide expedited DNA technology and forensic services to assist in processing mass disaster scenes, convicted offender samples, crime scene evidence, and reference samples on crimes that are typically given lower priority in as little time as 90 minutes. The WSP researched the latest developments in Rapid DNA technology, federal and state laws surrounding DNA databases, and requirements applicable to any mirror copies of the CODIS database. We used this information to design the Rapid DNA Pilot Program to implement the technology strategically and not negatively impact DNA operations, the preservation, and integrity of any evidence, or the WSP's participation in CODIS. Funding provided by the legislature for this project was available for twelve months (July 1, 2022-June 30, 2023) and included the budget for dedicated personnel, equipment, and supplies.

The pilot program designed by the WSP involves a phased approach due to WSP DNA program resources, as well as the growth and ongoing development of Rapid DNA technology. The phased approach of this pilot project will allow time for the advancement of the technology while incorporating it into laboratory operations with its approved and robust applications. Phase I of the pilot project will be testing and using the technology on those sample types currently validated and approved by the FBI, and forming a mass disaster DNA response program. The sample types appropriate for the Phase I are reference samples (oral swabs, blood), such as those from a convicted offender, suspect, or a relative searching for a missing person, as well as other single-source samples such as unidentified human remains (bone, teeth, tissue). Phase II of the pilot project will assess the suitability of Rapid DNA to test crime scene samples. Implementing the technology in stages will allow WSP to gain valuable experience and expertise with the Rapid DNA technology in order to be in a proactive position to implement Rapid DNA on crime scene evidence samples as soon it is approved by the FBI. The advent of Rapid DNA technology is an exciting recent and ongoing development in the field of forensic DNA testing, with many promising applications.

The WSP is appreciative of the opportunity to implement the technology into its system to provide expedited DNA services. Per ESSB 5693, WSP is to provide a final report to the legislature to describe major milestones and achievements of the program through June 30, 2023.

WSP's Major Milestones and Achievements as of June 2023

Personnel

Two new forensic scientist positions funded by this project were established in Spring 2022 with an effective start date of July 1, 2022. Both scientists underwent specialized Rapid DNA training

provided by the Rapid DNA instrument manufacturer(s) in June 2023.

- The technical lead DNA forensic scientist project position assigned to the CODIS laboratory was filled for all twelve months of the project. This lead scientist will oversee the pilot project, to include performing the validation of Rapid DNA technology. The technical lead DNA forensic scientist accomplished the following:
 - Conducted ongoing research into Rapid DNA regulations, available instrumentation, and programs in other states. This information was utilized to develop specifications required for the procurement process for the Rapid DNA instruments.
 - Hosted information sessions with representatives from several Washington law enforcement agencies to discuss the benefits and limitations of Rapid DNA technology.
 - Created an informational flyer to communicate information about the pilot program and educate WSP crime laboratory users on the current capabilities of Rapid DNA technology. The flyer was disseminated through the Washington Association of Sheriffs & Police Chiefs and WSP crime laboratories to WSP's user agencies.
 - Coordinated the installation of the new Rapid DNA equipment and the on-site training sessions provided by each vendor.
 - Procured essential supplies for method validation and disaster victim DNA identification.
 - Initiated approval process with agency IT department for approval of instrument software.
- The DNA forensic scientist project position in the Vancouver laboratory was filled for all twelve months of the project. This scientist will contribute to the pilot project after Phase I. This position accomplished the following:
 - Conducted high-priority DNA casework, adding capacity to the Vancouver laboratory to conduct testing in homicide, sexual assault, and other serious criminal offenses.
 - Collaborated with the CODIS technical lead scientist as needed on pilot project discussions.
 - Prepared site in the Vancouver laboratory to receive the new Rapid DNA equipment, to include the identification of any needed laboratory equipment and supplies.
 - Facilitated the transport of new Rapid DNA equipment and testing consumables to the Vancouver laboratory.

Rapid DNA Technology Equipment and Supplies

The selection and procurement of Rapid DNA instrumentation, software, and supplies followed all applicable Washington State procurement laws. The WSP researched the currently available, FBI-approved Rapid DNA instrumentation, which resulted in the selection of two vendors. Both vendors were ultimately selected for their apparent specialized application of the Rapid DNA technology: one for the cost-effective rapid processing of one or a few samples in the laboratory environment and the other for its ruggedized housing and the higher-throughput ability for deployment in the field, such as a mass disaster event requiring rapid DNA human identification services. However, each vendor's instrumentation could be suitable for both technology applications. The WSP DNA program

partnered with the WSP's Supply Section to initiate the procurement process in October 2022.

- The ThermoFisher RapidHit ID System was selected for the rush analysis of reference and offender samples in the laboratory. Two systems were procured in April 2023 and received on May 1, 2023. The purchase of each instrument included a computer system with RapidLINK software, installation, initial user on-site training, one-year warranty and preventive service/maintenance, and testing consumables to process 200 samples. One of the instruments was installed in the CODIS laboratory on May 31st (Figure 1), and the other instrument will be installed in the Vancouver crime laboratory. The vendor delivered on-site training for the instrument to twelve WSP staff members on June 6th.
- The ANDE Rapid DNA Identification System was selected to process disaster victim identification samples. One system was procured in April 2023 and received on June 9th. The purchase of the instrument system included a ruggedized transport case, a computer system with ANDE FAIRS software with a relationship statistics module, installation, initial on-site user training, one-year preventive service/maintenance, and testing consumables to process 200 samples. The vendor installed the instrument in the CODIS laboratory on June 13th (Figure 2). The vendor delivered the comprehensive on-site training for the instrument to five WSP DNA staff members on June 20-23.
- Additional supplies for the validation of Rapid DNA technology were purchased in June 2023, including equipment and supplies for processing disaster victim samples and other consumables for the Vancouver laboratory's Rapid DNA instrument.

WSP IT support will be leveraged to ensure the instrument's software, connection to the WSP network, and any DNA profiles retained in its closed system follow all security regulations. The Rapid DNA technology, instrumentation, and methods will be fully validated/performance checked by WSP prior to implementation, following the applicable FBI Quality Assurance Standards. This testing will occur in the second half of 2023 as resources allow.

Funding for the personnel, equipment, and supplies described above for WSP's Rapid DNA pilot program was time-restrictive and will expire as of July 1, 2023.



Figure 1: One RapidHit Rapid DNA system was installed in the WSP CODIS Laboratory in May 2023



Figure 2: One ANDE 6C Rapid DNA system was installed in the WSP CODIS Laboratory in June 2023

References:

- Flyer-‘WSP’s Rapid DNA Pilot Program and Frequently Asked Questions,’ July 2022; https://wsp.wa.gov/forensics/docs/crimelab/210464_Rapid_DNA_Pilot_Program_and_FAQ.pdf
- Implementation Plan for the WSP Rapid DNA Pilot Program, December 2021
- WSP Rapid DNA Pilot-Preliminary Report, December 2022