



# SolidX

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## Security Assessment

[www.solidx.tech](http://www.solidx.tech)

# **TABLE OF CONTENTS**

## **Summary**

Overview

Project Summary

Audit Summary

Vulnerability Summary

Audit Scope

## **Findings**

01 : Centralization Risk in \_hasBeenLiqAdded() Function

02 : Initial Token Distribution

03 : PotentialSandwich Attacks

04 : Redundant Code

05 : Typos In The Contract

06 : Function and Variable Naming Doesn't Match the Operating Environment

07 : Potential ResourceExhaustion

08 : FullInlinerNonExpressionSplitArgumentEvaluationOrder

09 : StorageWriteRemovalBeforeConditionalTermination

10 : DelegateCallReturnValue

Appendix

Disclaimer

About

## Summary

This report has been prepared for to discover issues and vulnerabilities in the source code of the project as well as any contract dependencies that were not part of an officially recognized library. A comprehensive examination has been performed, utilizing Static Analysis and Manual Review techniques. The auditing process pays special attention to the following considerations:

Testing the smart contracts against both common and uncommon attack vectors. Assessing the codebase to ensure compliance with current best practices and industry standards. Ensuring contract logic meets the specifications and intentions of the client. Cross referencing contract structure and implementation against similar smart contracts produced by industry leaders. Thorough line-by-line manual review of the entire codebase by industry experts.

The security assessment resulted in findings that ranged from critical to informational. We recommend addressing these findings to ensure a high level of security standards and industry practices. We suggest recommendations that could better serve the project from the security perspective:

Enhance general coding practices for better structures of source codes; Add enough unit tests to cover the possible use cases; Provide more comments per each function for readability, especially contracts that are verified in public; Provide more transparency on privileged activities once the protocols live.












## Project Summary

Project Name	SolidX - ( <a href="https://solidx.tech/">https://solidx.tech/</a> )
Platform	ETHEREUM
Language	Solidity
Codebase	<a href="https://etherscan.io/address/0x072382557067b36966dab6f5fb90be32c2da07eb">https://etherscan.io/address/0x072382557067b36966dab6f5fb90be32c2da07eb</a>
Commit	47674cccf80b356c2b0bf25b17f545ddf30e876fe6efb7399863f9aff3213339

## Audit Summary

Delivery Date	October 19, 2023
Audit Methodology	Static Analysis, Manual Review
Key Components	SolidX

## Vulnerability Summary

Vulnerability Summary	Total	 Pending	 Declined	 Acknowledged	 Partially Resolved	 Resolved
 Critical	0	0	0	0	0	0
 Major	0	0	0	0	0	0
 Medium	0	0	0	0	0	0
 Minor	0	0	0	0	0	0
 Informational	0	0	0	0	0	0
 Discussion	0	0	0	0	0	0

## Audit Scope

ID	File	SHA256 Checksum
CKP	contract.sol	f79198f1e334d2889b0de0d9507c2bf3e16e6299f37d30102d9496b69c383809

## Overview

### External Dependencies

The contract serves as the underlying entity to interact with third-party protocols (token- wrapping). The scope of the audit treats third-party entities as blackboxes and assumes their functional correctness. However, in the real world, third parties can be compromised and this may lead to lost or stolen assets.

### Privileged Functions

The contract contains the following privileged functions that are restricted by role with the modifier. Since the contract is the owner cannot modify the contract configurations and address attributes.

## Overview

### External Dependencies

The contract serves as the underlying entity to interact with third-party protocols (token- wrapping). The scope of the audit treats third-party entities as blackboxes and assumes their functional correctness. However, in the real world, third parties can be compromised and this may lead to lost or stolen assets.

### Privileged Functions

The contract contains the following privileged functions are restricted to gain access by the modifier/\_owner. They are used to modify the contract configurations and address attributes. We grouped these functions below.

## 01 | Centralization Risk in Function

### Description

The `addLiquidity()_hasLiqBeenAdded()` function calls the `UniswapV2Router.addLiquidityETH` function with the `to()` address specified as `owner()` for acquiring the generated LP tokens from the corresponding pool. As a result, over time the `_owner` address will accumulate a significant portion of LP tokens. If `_owner` is an EOA (Externally Owned Account), mishandling of its private key can have devastating consequences to the project as a whole.

### Recommendation

We advise `to()` address of the `UniswapV2Router.addLiquidityETH()` function call to be replaced by the `contract()` itself, i.e. `address(this)`, and to restrict the management of the LP tokens within the scope of the contract's business logic. This will also protect the LP tokens from being stolen if the `_owner()` account is compromised. In general, we strongly recommend centralized privileges or roles in the protocol to be improved via a decentralized mechanism or via smart-contract based accounts with enhanced security practices, f.e. `Multisignature wallets()`.

## 02 | Initial Token Distribution

Category	Severity	Location	Status
Logical Issue	● Minor	projects/contract.sol (98a012): 497	① Acknowledged

### Description

All of the tokens are sent to the contract deployer when deploying the contract. This could be a centralization risk as the deployer can distribute those tokens without obtaining the consensus of the community.

### Recommendation

We recommend the team to be transparent regarding the initial token distribution process.

```
function changelimits(uint256 _buy, uint256 _trans, uint256 _wallet) external onlyOwner {
    uint256 newTx = (totalSupply() * _buy) / 100;
    uint256 newTransfer = (totalSupply() * _trans) / 100;
    uint256 newWallet = (totalSupply() * _wallet) / 100;
    _maxTxAmountPercent = _buy;
    _maxTransferPercent = _trans;
    _maxWalletPercent = _wallet;
    uint256 limit = totalSupply().mul(5).div(1000);
    require(newTx >= limit && newTransfer >= limit && newWallet >= limit, "Max TXs and Max
wallet cannot be less than .5%");
}

function changeTaxReceiverAddresses(address _liquidity_receiver, address
marketing_receiver, address _development_receiver) external onlyOwner {
    liquidity_receiver = _liquidity_receiver;
    marketing_receiver = _marketing_receiver;
    development_receiver = _development_receiver;
}
```



## 03 | Potential Sandwich Attacks

### Description

A sandwich attack might happen when an attacker observes a transaction swapping tokens or adding liquidity without setting restrictions on slippage or minimum output amount. The attacker can manipulate the exchange rate by frontrunning (before the transaction being attacked) a transaction to purchase one of the assets and make profits by backrunning (after the transaction being attacked) a transaction to sell the asset.

The following functions are called without setting restrictions on slippage or minimum output amount, so transactions triggering these functions are vulnerable to sandwich attacks, especially when the input amount is large:

### Recommendation

We recommend setting reasonable minimum output amounts, instead of 0, based on token prices when calling the fore mentioned functions.

```
interface IFactory{
    function createPair(address tokenA, address tokenB) external returns (address pair);
    function getPair(address tokenA, address tokenB) external view returns (address pair);
}

interface IRouter {
    function factory() external pure returns (address);
    function WETH() external pure returns (address);
    function addLiquidityETH(
        address token,
        uint amountTokenDesired,
        uint amountTokenMin,
        uint amountETHMin,
        address to,
        uint deadline
    ) external payable returns (uint amountToken, uint amountETH, uint liquidity);
}
```

## 04 | Redundant Code

Category	Severity	Location	Status
Logical Issue	● Informational	projects/contract.sol (98a012): 862	① Acknowledged

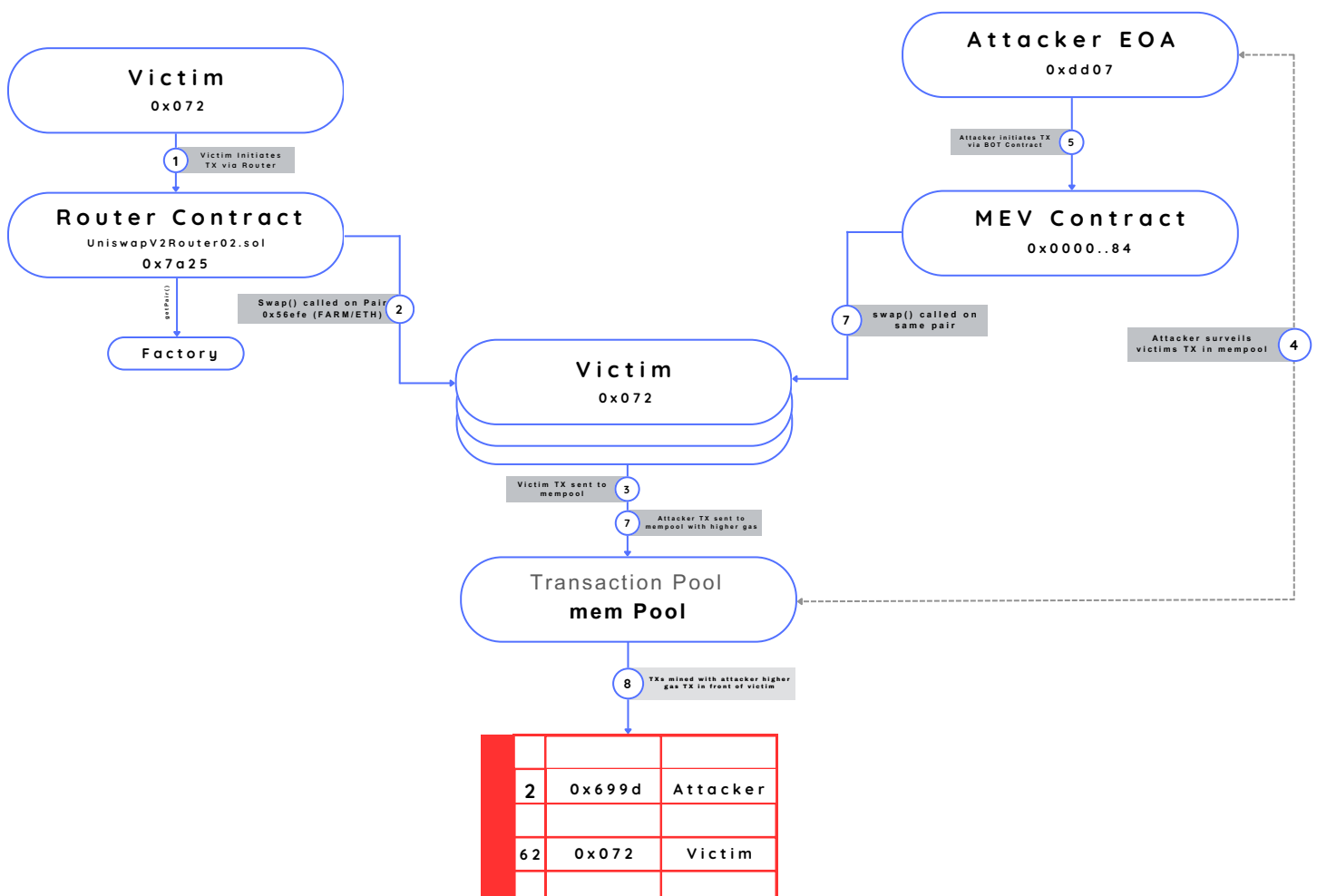
### Description

The condition! \_isExcluded[sender] & !\_isExcluded[recipient] can be included in else .

```

861 ... else if (!_isExcluded[sender] && !_isExcluded[recipient]) {
862     _transferStandard(sender, recipient, amount);
863 } ...

```



## 05 | Typos In The Contract

Category	Severity	Location	Status
Coding Style	● Informational	projects/contract.sol (98a012): 470, 670	① Acknowledged

### Description

There are several typos in the code and comments.

1. In the following code snippet, `tokensIntoLiquidity()` should be `tokensIntoLiquidity()`

```

1 event SwapAndLiquify(
2     uint256 tokensSwapped,
3     uint256 ethReceived,
4     uint256 tokensIntoLiquidity
5 );

```

2. `recieve()` should be `recieve()` `_swapping()` should be `_swapping()` in the line of comment `//to _recieve ETH from UniswapV2Router when swaping()` .

## 06 | Function and Variable Naming

### Description

`_maxTransferAmount()`

`_maxTxAmount()`

`_maxWalletToken()`

`_allowance()`

`_balanceOf()`

`_decimals()`

`_getOwner()`

`_isFeeExempt()`

`_name()`

`_pair()`

`_swapThreshold()`

`_symbol()`

`_totalSupply()`

## 07 | Potential Resource Exhaustion

Category	Severity	Location	Status
Logical Issue	● Informational	projects/contract.sol (98a012): 614, 709	① Acknowledged

### Description

The `farloop()` within functions and `_getCurrentSupply()` takes the variable `_excluded.length()`, as the maximal iteration times. If the size of the array is very large, it could exceed the gas limit to execute the functions. In this case, the contract might suffer from DoS (Denial of Service) situation.

### Recommendation

We recommend the team review the design and ensure investors that this would not cause loss to the project.

## 08 | FullInlinerNonExpressionSplitArgumentEvaluationOrder

### Description

Function call arguments in Yul are evaluated right to left. This order matters when the argument expressions have side-effects, and changing it may change contract behavior. FullInliner is an optimizer step that can replace a function call with the body of that function. The transformation involves assigning argument expressions to temporary variables, which imposes an explicit evaluation order. FullInliner was written with the assumption that this order does not necessarily have to match usual argument evaluation order because the argument expressions have no side-effects. In most circumstances this assumption is true because the default optimization step sequence contains the ExpressionSplitter step. ExpressionSplitter ensures that the code is in *\*expression-split form\**, which means that function calls cannot appear nested inside expressions, and all function call arguments have to be variables. The assumption is, however, not guaranteed to be true in general. Version 0.6.7 introduced a setting allowing users to specify an arbitrary optimization step sequence, making it possible for the FullInliner to actually encounter argument expressions with side-effects, which can result in behavior differences between optimized and unoptimized bytecode. Contracts compiled without optimization or with the default optimization sequence are not affected. To trigger the bug the user has to explicitly choose compiler settings that contain a sequence with FullInliner step not preceded by ExpressionSplitter.

## 09 | StorageWriteRemovalBeforeConditionalTermination

### Description

A call to a Yul function that conditionally terminates the external EVM call could result in prior storage writes being incorrectly removed by the Yul optimizer. This used to happen in cases in which it would have been valid to remove the store, if the Yul function in question never actually terminated the external call, and the control flow always returned back to the caller instead. Conditional termination within the same Yul block instead of within a called function was not affected. In Solidity with optimized via-IR code generation, any storage write before a function conditionally calling `return(...)` or `stop()` in inline assembly, may have been incorrectly removed, whenever it would have been valid to remove the write without the `return(...)` or `stop()`. In optimized legacy code generation, only inline assembly that did not refer to any Solidity variables and that involved conditionally-terminating user-defined assembly functions could be affected.

## 10 | DelegateCallReturnValue

### Description

The return value of the low-level `.delegatecall()` function is taken from a position in memory, where the call data or the return data resides. This value is interpreted as a boolean and put onto the stack. This means if the called function returns at least 32 zero bytes, `.delegatecall()` returns false even if the call was successful.



# Appendix

## Finding Categories

### Centralization / Privilege

Centralization / Privilege findings refer to either feature logic or implementation of components that act against the nature of decentralization, such as explicit ownership or specialized access roles in combination with a mechanism to relocate funds.

### Logical Issue

Logical Issue findings detail a fault in the logic of the linked code, such as an incorrect notion on how block.timestamp works.

### Volatile Code

Volatile Code findings refer to segments of code that behave unexpectedly on certain edge cases that may result in a vulnerability.

### Coding Style

Coding Style findings usually do not affect the generated byte-code but rather comment on how to make the codebase more legible and, as a result, easily maintainable.

### Inconsistency

Inconsistency findings refer to functions that should seemingly behave similarly yet contain different code, such as a constructor assignment imposing different requirements on the input variables than a setter function.

### Checksum Calculation Method

The "Checksum" field in the "Audit Scope" section is calculated as the SHA-256 (Secure Hash Algorithm 2 with digest size of 256 bits) digest of the content of each file hosted in the listed source repository under the specified commit.

The result is hexa-decimal encoded and is the same as the output of the Linux "sha256sum" command against the target file.

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