



# SMART CONTRACT SECURITY AUDIT

Final report

Plan: Simple

## Umbrella Protocol

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## ♦ INTRODUCTION

Implementation of ERC-20 token standard with fees on transfers. Fees are used to buy back reward token in uniswap pair.

Name	Umbrella Protocol
Audit date	2022-08-17 - 2022-08-17
Language	Solidity
Network	Binance Smart Chain

## ♦ CONTRACTS CHECKED

Name	Address
DividendDistributor	0x2238fefbb7f27a53a5f870021a30815bd5023f6c
BuybackBabyToken	0x2238fefbb7f27a53a5f870021a30815bd5023f6c
Clones	0x2238fefbb7f27a53a5f870021a30815bd5023f6c

## ♦ AUDIT PROCESS

The code was audited by the team according to the following order:

Automated analysis

- ♦ Scanning the project's smart contracts with several publicly available automated Solidity analysis tools
- ♦ Manual confirmation of all the issues found by the tools

Manual audit

- ♦ Thorough manual analysis of smart contracts for security vulnerabilities
- ♦ Smart contracts' logic check

## ♦ ATTACKS CHECKED

Title	Check result
Unencrypted Private Data On-Chain	✓ passed
Code With No Effects	✗ failed
Message call with hardcoded gas amount	✓ passed
Typographical Error	✓ passed
DoS With Block Gas Limit	✓ passed
Presence of unused variables	✗ failed
Incorrect Inheritance Order	✓ passed
Requirement Violation	✓ passed
Weak Sources of Randomness from Chain Attributes	✓ passed
Shadowing State Variables	✓ passed
Incorrect Constructor Name	✓ passed
Block values as a proxy for time	✓ passed
Authorization through tx.origin	✓ passed



DoS with Failed Call	✓ passed
Delegatecall to Untrusted Callee	✓ passed
Use of Deprecated Solidity Functions	✓ passed
Assert Violation	✓ passed
State Variable Default Visibility	✓ passed
Reentrancy	✓ passed
Unprotected SELFDESTRUCT Instruction	✓ passed
Unprotected Ether Withdrawal	✓ passed
Unchecked Call Return Value	✓ passed
Floating Pragma	✓ passed
Outdated Compiler Version	✓ passed
Integer Overflow and Underflow	✓ passed
Function Default Visibility	✓ passed

## ◆ OVERVIEW OF RELEVANCE LEVELS

### High relevance

Issues of high relevance may lead to losses of users' funds as well as changes of ownership of a contract or possible issues with the logic of the contract.

High-relevance issues require immediate attention and a response from the team.

**Medium relevance**

While issues of medium relevance don't pose as high a risk as the high-relevance ones do, they can be just as easily exploited by the team or a malicious user, causing a contract failure and damaging the project's reputation in the process. Usually, these issues can be fixed if the contract is redeployed.

Medium-relevance issues require a response from the team.

**Low relevance**

Issues of low relevance don't pose high risks since they can't cause damage to the functionality of the contract. However, it's still recommended to consider fixing them.

## ❖ ISSUES

### High relevance issues

#### 1. Excessive owner's rights (BuybackBabyToken)

- a. The owner can exclude any address from dividends reception;
- b. The owner can update the swapThreshold variable with a wrong value. This may halt the distribution of the fees for a long period of time. Enabling back swaps and liquidity adding may lead to the token price wrecking if the contract's balance is comparable to a pair reserves.

#### 2. No error handling (BuybackBabyToken)

`_transferFrom()` and `swapBack()` functions contain empty try/catch blocks in case of reward token transfer failure. Therefore, users' shares may become unfair and inconsistent.

### Medium relevance issues

#### 1. Swaps with 100% slippage (BuybackBabyToken)

swapExactTokensForETHSupportingFeeOnTransferTokens() and swapExactETHForTokensSupportingFeeOnTransferTokens() functions call router with 100% slippage. The transactions sent from this contract may be front-run resulting in swaps with an undesired rate (sandwich attacks).

### Low relevance issues

#### 1. Lack of events (DividendDistributor)

No events are emitted in setShare(), deposit(), distributeDividend(), setDistributionCriteria()

#### 2. Gas optimisation (DividendDistributor)

- a. rewardToken, router, \_token should be marked immutable;
- b. dividendsPerShareAccuracyFactor should be const;

#### 3. Redundant code (BuybackBabyToken)

Setter function and access modifier for buyBackers are not applied anywhere.

#### 4. Lack of events (BuybackBabyToken)

No events are emitted in setFeeReceivers(), setSwapBackSettings(), setTargetLiquidity(), setDistributorSettings(), setFees(), setIsFeeExempt().

#### 5. Gas optimization (BuybackBabyToken)

\_name, \_symbol, \_totalSupply, router, pair should be marked as immutable.

#### 6. Redundant code (Clones)

The library is not used in the contract.

## ✦ CONCLUSION

Umbrella Protocol DividendDistributor, BuybackBabyToken, Clones contracts were audited. 2 high, 1 medium, 6 low relevance issues were found.

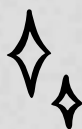


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